Distribution Agreement

In presenting this thesis as a partial fulfillment of the requirements for a degree from Emory University, I hereby grant to Emory University and its agents the non-exclusive license to archive, make accessible, and display my thesis in whole or in part in all forms of media, now or hereafter now, including display on the World Wide Web. I understand that I may select some access restrictions as part of the online submission of this thesis. I retain all ownership rights to the copyright of the thesis. I also retain the right to use in future works (such as articles or books) all or part of this thesis.

Yejin Choi April 11, 2022

Evaluating the Cultural Applicability of a Mindful Eating Intervention: A Comparison of Asian and Caucasian College Women

by

Yejin Choi

Linda W. Craighead, Ph.D.

Adviser

Psychology

Linda W. Craighead, Ph.D.

Adviser

Marshall Duke, Ph.D.

Committee Member

Jennifer Frediani, Ph.D.

Committee Member

2022

Evaluating the Cultural Applicability of a Mindful Eating Intervention: A Comparison of Asian and Caucasian College Women

By

Yejin Choi

Linda W. Craighead, Ph.D.

Adviser

An abstract of
a thesis submitted to the Faculty of Emory College of Arts and Sciences
of Emory University in partial fulfillment
of the requirements of the degree of
Bachelor of Arts with Honors

Psychology

2022

Abstract

Evaluating the Cultural Applicability of a Mindful Eating Intervention: A Comparison of Asian and Caucasian College Women

By Yejin Choi

App-based mindful eating interventions have increasingly established themselves as an effective extension to treatments for eating pathology. However, the potential for differential effectiveness of this intervention type across different cultural identities has been severely understudied. In particular, Asian women's experiences with eating disorders have not been well described. The present study set out to address this gap in the literature by evaluating the cultural applicability of a mindful eating intervention as used by Asian and Caucasian college women. The specific intervention used was the Mindful Eating Coach (MEC), developed by the Healthy Eating and Weight Support (HEWS) Lab at Emory University. The intervention's effectiveness was assessed by comparing Asian and Caucasian participants on variables of eating pathology (i.e., dietary intent, anorectic cognitions, binge eating, and preoccupation with eating/weight/shape), a measure of weight discrepancy, and self-compassion. Feedback on app acceptability was also assessed. The intervention was not differentially effective for Asian and Caucasian participants on any of the intervention outcomes. Both groups improved similarly on the three primary measures of eating pathology and on self-compassion. In addition, greater self-compassion was associated with decreases in eating pathology. These findings are promising and suggest that the MEC and other app-based mindful eating interventions may be acceptable and effective for a range of populations. Some limitations of this study were the lack of acculturation measures and the use of a relatively homogenous university sample that included a fairly wide range of Asian women from different cultures. Continued investigation of sociocultural variables that may relate to Asian women's eating behaviors and weight concerns is warranted.

Evaluating the Cultural Applicability of a Mindful Eating Intervention: A Comparison of Asian and Caucasian College Women

By

Yejin Choi

Linda W. Craighead, Ph.D.

Adviser

A thesis submitted to the Faculty of Emory College of Arts and Sciences
of Emory University in partial fulfillment
of the requirements of the degree of
Bachelor of Arts with Honors

Psychology

2022

Acknowledgements

I would first like to express my deepest gratitude to Dr. Linda Craighead, my advisor, for the endless support and guidance she provided me throughout this process. Linda—thank you so much for giving me this incredibly rewarding experience. I really could not have completed this thesis without you! I would also like to give a huge thank you to Brittany Robbins, the most supportive, kind, and helpful graduate student that I could have ever asked for. You were truly an inspiration and role model, and I will always remember you as my statistics angel. Thank you also to Dr. Marshall Duke and Dr. Jennifer Frediani for serving on my honors committee and participating in my oral defense. Your insightful comments taught me to always challenge and expand my ways of thinking, both as a researcher and as a global citizen. Finally, much love and thanks to my family and friends for giving me the constant encouragement, support, and fun memories that helped me to get through this process!

Table of Contents

Introduction

The present study aims to evaluate the cultural applicability of a brief (i.e., three-week) mobile intervention on mindful eating, called the Mindful Eating Coach (MEC), specifically for Asian women. Cultural applicability of the intervention will be assessed through comparing Asian and Caucasian women on variables of eating pathology (i.e., dietary intent, anorectic cognitions, binge eating, and preoccupation with eating/weight/shape), weight discrepancy, and self-compassion (as a mediator) at both pre- and post-intervention time points. Participants' feedback on app acceptability will also be compared using both quantitative and qualitative analyses.

Background

1.1 Importance of Eating Disorder (ED) Research

Eating disorders (EDs) are serious psychiatric conditions which manifest as persistent disordered eating behaviors, attitudes, and/or thoughts, and they significantly interfere with both the physical and psychosocial functioning of those affected (Santomauro et al., 2021, p. 320). These disorders are both disabling and costly for how they can impair one's daily physical, mental, and social health. According to a 2020 literary research review on the burden of eating disorders, individuals with a current or former eating disorder are at risk of increased mortality, higher morbidity, a decreased quality of life, increased cost of living, and problems with childbearing (van Hoeken & Hoek, 2020, p. 521).

Eating disorders are also a highly prevalent issue across global populations: the 2019 Global Burden of Disease Study (GBD 2019) estimated that, based on the 54 studies included in its analysis, there were approximately 13.6 million cases of Bulimia Nervosa (BN) and/or Anorexia Nervosa (AN), 17.3 million cases of Binge-Eating Disorder (BED), and 24.6 million

cases of Other Specified Feeding or Eating Disorder (OSFED) worldwide in 2019 (Santomauro et al., 2021). Such high global rates of affected individuals make continued research on eating disorders and their corresponding health implications, in addition to researching lesser known disorders and subclinical concerns related to eating, all the more important. Furthermore, across all clinical and subclinical levels of disordered eating, young adult females constitute the population at highest risk for practicing the respective maladaptive behaviors (Santomauro et al., 2021; Querimit, 2005; Mintz & Kashubeck, 1999). Therefore, it is crucial that research on disordered eating pay special attention to studying female populations and their specific experiences across a wide spectrum of eating and weight concerns.

1.2 Significance of Cross-cultural ED Research

Over the last four decades, there has been an exponential increase in ED research on women; however, very few of these studies display any cross-cultural variety. The majority of study samples consist primarily of Caucasian women, and women of color have frequently been excluded from ED literature (Akan & Grilo, 1995). Furthermore, ED etiology and diagnoses have largely maintained a Eurocentric bias that is founded in the DSM-5 and other clinical manuals (Smart & Tsong, 2014, p. 345). Accordingly, eating disorders in past literature were largely characterized as illnesses pertaining only to young, White, and affluent women.

However, there has been a small yet noticeable shift away from such homogenous research in recent ED studies: an increasing number of researchers have conducted studies with more diverse samples and found that eating and body concerns are evident across the globe (Smart & Tsong, 2014, p. 344). Through several of these studies, weight and eating concerns have been increasingly recognized among women of color (often within college-age samples),

and various ED symptoms (most notably of anorexia nervosa (AN), bulimia nervosa (BN), and binge eating disorder (BED)) have been measured across men and women of diverse racial/ethnic, cultural, and socioeconomic backgrounds (Querimit, 2005, p. 6; Cummins et al., 2005, p. 553). Additionally, this growing area of cross-cultural research has found that various processes closely involved in ED development and subsequent diagnosis can be heavily informed by cultural values (McCarty et al., 1999; Lee & Katzman, 2002, p. 261). For instance, processes such as individuation, maintenance of control, emotional expression, and methods of mood regulation are often culturally constructed (Polivy & Herman, 1993; Stice, 2001; Uba, 1994). Thus, several researchers are advocating for more studies to investigate how specific aspects of culture can impact ED development. As Cummins states, "The importance of early recognition [of ED development in patients] combined with the likelihood that eating disorders may often go unidentified in ethnic minorities make the study of eating disorders in non-White populations an even more critical endeavor" (Cummins et al., 2005, p. 553).

1.3 Lack of Asian Representation in Cross-cultural ED Research

Despite this hopeful push towards recognizing the need for more cross-cultural research, there is still little research being done to investigate diverse sociocultural factors in relation to disordered eating (Cummins et al., 2005, p. 554). The majority of ED research on women still use white and monocultural samples, and there is relatively scarce research material existing on racial and ethnic minorities. In particular, Asian women are considered to be virtually ignored and absent from ED treatment literature despite making up one of the largest minority groups in the United States (Ponterotto et al., 2010, p. 253; Smart & Tsong, 2014, p. 345; Akan & Grilo, 1995, p. 88). This notable exclusion of Asian women from ED literature raises concerns, not

only due to the ongoing lack of diversity in the field, but particularly because the few studies that do exist have shown how Asian women also experience disordered eating and related concerns. They are at equal—if not at greater—risk for depression, anxiety, and other comorbidities associated with EDs, and yet very little research is being done to examine their phenomenological experiences of eating and weight concerns within their specific cultural context (Smart & Tsong, 2014, p. 344).

1.3.1 Additional ED considerations for Asian Women: gendered racial microaggressions, acculturative stress, and help-seeking stigma

The persistent lack of Asian representation in ED literature is also particularly distressing as Asian women can be further susceptible to maladaptive eating behaviors based on gendered racial microaggressions, acculturative stress, and help-seeking stigma. In the case of gendered racial microaggressions, they are found to significantly affect Asian women's mental, emotional, and physical well-being, which are all factors that can significantly impact eating attitudes and behavior (Kawamura, 2002). Several ED studies on Asian women specifically report the notable burden and harm associated with a lot of these stereotypic messages: for instance, one study found that several of its Asian participants who did not possess a thin body type felt "doubly stigmatized" by both an American ideal of thinness and an expectation that Asians should be slim (Liou & Bauer, 2007, p.140). Harmful stereotypes may also include those that project specific expectations of small size, femininity, or Western beauty ideals onto Asian women that they are physically unable to meet (ie., skin tone, facial features), which can subsequently affect their experiences with eating (Hall, 1995; Evans & McConnell, 2003; Harrison, 2003; Stein et al., 2010; Zones, 2005). In alignment with these concerns, a recent study found that gendered

racial microaggressions for Asian women were positively associated with disordered eating (Le et al., 2020, p. 127). Overall, greater ED research needs to investigate how microaggressions can further subject Asian women to various disordered eating behaviors.

Acculturative stress is another factor that is viewed as being able to influence Asian women's disordered eating experiences. Similar to microaggressions, acculturative stress often results from attempting to adjust to a new culture and resolve the resulting differences (Claudat et al., 2016, p. 89). Several studies have shown that Asian American women, when compared with other ethnic groups, exhibit higher levels of acculturative stress and lower levels of self-esteem, a finding which is often attributed to the Asian collectivist value of focusing less on the self for the good of the larger group (Tsai et al., 2001). These findings are particularly concerning, since recent studies have also found that acculturative stress, immigration, and other assimilative life changes are associated with increased eating pathology in Asian American women (Claudat et al., 2016, p. 95; Yokoyama, 2007, p.184).

Help-seeking stigma is yet another major factor that can increase Asian women's susceptibility to eating pathology—Asian Americans have repeatedly reported less favorable attitudes towards, and the lowest rates of utilizing, counseling services (Gilbert et al., 2007; Abe-Kim et al., 2007; Marbley, 2011). Asian Americans have also routinely expressed less tolerance for the stigma associated with seeking professional psychological services (this is often attributed to Asian individuals perceiving a greater sense of shame over seeking professional help), as well as less interpersonal openness about psychological concerns compared to White American subjects (Tylka & Sabik, 2010; Masuda et al., 2017). Furthermore, current counseling and treatment literature also fails to competently address help-seeking stigma in Asian cultures. There is a dearth of research in the field on the Asian American racial identity, and clinician bias

has been found to hamper many Asian individuals' referral to adequate treatment (Smart & Tsong, 2014, p. 344; Ponterotto et al., 2010, p. 263). Therefore, it is clear that further ED research needs to be done to effectively treat Asian individuals in the face of help-seeking stigma effects. However, despite how each of these culturally based factors (i.e., gendered racial microaggressions, acculturative stress, and help-seeking stigma) increase Asian women's risk for disordered eating, they remain one of the least studied groups across all literatures of ED, behavioral health, and professional service utilization (Masuda et al., 2017, p. 89).

2.1 Cultural Influence on Eating Behavior

As previously established, the small yet growing area of cross-cultural ED research demonstrates the marked influence that culture holds over the specific development of eating patterns and disorders; studies have not only found culture to influence why, what, how, and with whom we eat, but several sociocultural values have also been found to hold significant effects on individuals' weight, eating behaviors and attitudes, and body image (Miller & Pumariega, 2001; Airhihenbuwa, 2010; Liou & Bauer, 2007, p.140; Akan & Grilo, 1995, p. 81). The majority of intercultural studies also reveal that, as a consequence of cultural influence, differences in racial identity (i.e., Asian versus Caucasian) are often associated with differences in ED development (Regan & Cachelin, 2006, p. 523).

2.2 Current Literature on Asian versus Caucasian Women's Eating Experiences

Comparative literature specifically investigating ED in Asian samples most commonly cite patterns of differences between Asian and Caucasian women (Bruening & Perez, 2019, p. 131). For instance, one study comparing Asian American and Euro American college women on

body image reported that, although both groups were similarly dissatisfied with their bodies, the Asian American women were even less satisfied with the size of their stomach, shoulders, arms, face, hair, and height (Koff et al., 2001, p. 925). Similarly, several other studies have reported significant differences between Asians and Caucasians on factors influencing ED development, with Asian American women reporting lower self-esteem and Caucasian women exhibiting generally higher levels of eating and weight concern (Akan & Grilo, 1995, p. 181; Mintz & Kashubeck, 1999). However, for most of these comparative studies, the exact sociocultural explanations behind each of these reported differences remain largely speculative due to the current gaps in literature. Though culture is still found to be a key influence on eating pathology and distress across different racial identities, the complexities of how exactly they relate to one another need to be further researched (Bruening & Perez, 2019, p. 131).

In specific reference to Asian women's experiences with eating, Yokoyama explains that factors such as familial and multicultural socialization of eating need to be further researched as influences on their ED development. A particular attention to ethnic, socioeconomic, and sexual orientation variations within the larger Asian group are also encouraged (Yokoyama, 2007, pp. 183-184). Thus, to achieve a more comprehensive understanding of specific Asian versus Caucasian group differences on disordered eating, additional studies also need to investigate Asian women's eating experiences specifically within the context of their layered cultural identity.

2.3 Collectivist Influence on Eating Behavior for Asian Women

At the broadest level, Eastern and Western cultures are differentiated by their respective collectivist or individualist mindset. Asian cultures are typically associated with collectivism,

meaning that individuals within these societies tend to prioritize group interests over their own in order to maintain close relationships with others and avoid loss of face (Orji & Mandryk, 2014, p. 209). Consequently, Asian women may be driven by collectivist motives of "fitting in" to group norms for their various eating behaviors and attitudes. One study examining Chinese Americans on obesity risk revealed that eighty percent of this sample indicated their parents as a major social influence impacting their food choices (their friends, relatives, media exposure, athletic coaches, and co-workers closely followed in significance; Liou & Bauer, 2007, 137). In the same study, a third of the Chinese American participants also identified social impetus factors (i.e., peer support, doctor's advice, parental pressure) as ideal and effective ways to increase their confidence in eating healthfully (Liou & Bauer, 2007, p. 137). Thus, this study demonstrated how social factors and group attitudes acted as clear motivations behind the eating behaviors of Chinese Americans (Liou & Bauer, 2007, pp. 138-139). Similarly, a few other ED studies on Asian women also show this collectivist tendency in practice. For instance, one study found that Asian participants cited mostly contextual causes (i.e., the Asian culture's emphasis on thinness, family criticism of weight, and comparison to other Asian women) for their experiences of weight gain, mild body dissatisfaction, and a desire to be thinner (Smart & Tsong, 2014, p. 344). Another study reported that, for Asian American women suffering from sexual trauma, an eating disorder may be a preferred method of coping as its rather hidden element can help them save face for the family and avoid feelings of public shame (Yokoyama, 2007, p.184). Thus, it is clear overall that a collectivist mindset is likely to affect the various eating behaviors of Asian women.

These findings of collectivist influence on eating pattens for Asians raises concerns, since prior research shows that individuals in collectivist cultures may be more vulnerable to eating

disorders given the pressures to fit into group norms (Jackson et al., 2006, p. 500). Prior research also shows that the measured effectiveness of various healthy eating *interventions* for individuals can be influenced by their own collectivist or individualist orientation (Orji & Mandryk, 2014, p. 209). Therefore, it is critical that future ED research and interventions consider their specific cultural applicability for individuals from collectivist cultures. Though there have been brief mentions in pertinent literature on implementing group and family-based interventions for Asian clients, the topic of specific cultural applicability for Asians in ED research remains largely unstudied (Stein et al., 2001, p. 722).

2.4 Inconsistent Findings in Asian-Caucasian Comparative ED Literature

In addition to the current lack of ED research on Asian individuals, the reported findings in specific Asian-Caucasian comparative ED literature have also been highly mixed and inconsistent. At the broadest level, there are a relatively equal number of studies which report that either Caucasian or Asian women show greater levels of concerns than the other group in regard to eating attitudes and pathology. There is also a considerable number of studies suggesting that both Asian and Caucasian women display equal levels of concerns (Smart & Tsong, 2014, p. 345). For instance, several existing studies report contradictory findings on which racial identity is subject to a greater emphasis on thinness. Whereas some of these researchers found eating disorders to be more common among Caucasian women due to stronger Western attitudes concerning ideal body size, dieting, and an emphasis on slimness, other researchers reported that Asian women display greater eating pathology as they endorse a smaller and thinner body size than what is idealized by their White peers (Sanders & Heiss, 1998, p. 15; Cummins et al., 2005, p. 562; Bruening & Perez, 2019, p. 131). A second example

of contradictory findings in Asian-Caucasian ED research involves differences over a fear of fat. Several studies argue that Caucasian women exhibit a more intense fear of fat (such as one study which found that Asian anorexic patients do not attribute their food refusal to a fear of fat like Caucasian patients), but an equal number of studies also make the opposite argument that a fear of fat is higher in Asian American women (Lee & Kaztman, 2002, p. 261; Sanders & Heiss, 1998, p. 15). Yet another example of inconsistent findings within Asian-Caucasian ED research involves compensatory behaviors and body dissatisfaction. Whereas several studies report that Asian women score higher in these categories, others argue that Caucasian women demonstrate greater levels of both compensatory and body dissatisfaction concerns (Bruening & Perez, 2019, p. 123; Smart & Tsong, 2014, p. 344; Cummins et al., 2005, p. 562).

Overall, these rampant inconsistencies in current Asian-Caucasian ED literature are largely attributed to various methodological shortcomings. Some of the commonly cited problems are the use of small convenience samples, measures that are not validated for Asian women (including unreliable assessments of acculturation), varying definitions of eating disorders, and inadequate knowledge of potential cultural differences (Smart & Tsong, 2014, p. 344; Cummins et al., 2005, p. 565). Given this prevalence of conflicting ED research and findings on Asian-Caucasian group differences, it is necessary that more ED studies explore Asian cultural applicability as well as build upon previously validated measures to increase reliability in future research.

3.1 The Significance of Mobile App Interventions for Disordered Eating

As previously noted, eating disorders are serious psychiatric conditions that present a considerable threat to one's physical, psychological, and social health. Even subclinical levels of

disordered eating have been found to associate with clinically significant distress and an increased risk for ED development. Given these risks associated with disordered eating, it is critical that treatment options include interventions that can be accessible and appealing to a wide range of client populations.

Although there is a wide range of evidence-based interventions for treating eating pathology, many individuals with relevant concerns either remain undertreated or untreated. Common causes of this treatment gap are a lack of accessibility to resources, high cost of treatment, and the stigma associated with mental health (Griffiths et al., 2018; Kazdin et al., 2016; Juarascio et al., 2015). Of even greater concern is that, for the few individuals who do receive clinical treatments, the interventions provided are often not evidence-based or are missing the most crucial elements of their empirically-supported effectiveness (Fairburn & Wilson, 2013; de Jong et al., 2020; von Ranson et al., 2013; Waller, 2016). Thus, there is a clear need for more evidence-based interventions that are highly disseminable and accessible for individuals with eating and weight concerns.

In response to the current treatment gap, more technological interventions have been developed in order to increase the dissemination and accessibility of various evidence-based ED interventions. Specifically, mobile-health applications (mHealth apps) are a mode of delivering interventions that can be accessible for individuals on their mobile devices (ie., iPhones). This specific form of intervention has proven to hold several advantages over traditional, face-to-face treatment approaches (Baumel & Kane, 2018). For instance, mHealth apps have been found to exponentially increase individuals' accessibility to evidence-based treatments. Not only are mHealth apps a low-cost and easily disseminable medium, but they can also help to overcome logistical barriers to receiving treatment (i.e., scheduling conflicts, travel; Rivera et al., 2016).

Mobile interventions have also demonstrated additional advantages over influencing behavioral change. For instance, users can engage more frequently with a given app (which would lead to greater sustained behavioral changes), and they can also engage in real-time self-monitoring of their eating behaviors (which would help to increase mindful awareness; Juarisco et al., 2015; Mason et al., 2018). In specific relation to mindful eating interventions, mHealth apps have also demonstrated significant effects on improving overall maladaptive eating patterns (Martinez, 2017; Marx, 2016; Mason et al., 2018). Therefore, the use of mobile app technology to provide disordered eating interventions can help to pointedly and effectively address the existing treatment gaps in eating pathology.

3.2 Incorporation of Mindful Eating in Disordered Eating Interventions

Out of the current evidence-based treatments for EDs, cognitive-behavioral therapy (CBT) is largely considered to be the first line of treatment. CBT primarily guides patients to identify and/or alter some of their own cognitions in order to prevent the onset of eating-related negative affect and behavior (de Jong et al., 2020). Across all these CBT-related treatments, a central component to their effectiveness is considered to be some form of self-monitoring. Therefore, CBT treatments for disordered eating typically center around a self-monitoring of one's food-intake (Fairburn, 2008). However, despite how monitoring food-intake has been evaluated as an effective intervention in several non-clinical and smaller samples, considerable research has also found food monitoring to increase aversive responses and an overall preoccupation with food across many individuals (Barakat et al., 2017; Lindgreen et al., 2021). Thus, eating interventions that focus on monitoring one's food-intake can potentially aggravate an individual's eating-related difficulties (Dicker & Craighead, 2004).

Substantial literature now suggests that mindful eating practices can be an effective alternative to the focus on food-monitoring in traditional disordered eating interventions; several studies have not only found food-monitoring to be unnecessary in treating disordered eating, but mindful eating has also been observed to significantly improve eating patterns as well as feelings of self-efficacy and control (Yu et al., 2020; Katterman et al., 2014; Sala et al., 2020). In general, mindful eating is defined as eating with intention while paying attention—the practice essentially entails developing a greater awareness of one's internal hunger and satiety cues during each eating experience (Nelson, 2017; Allen & Craighead, 1999). The overarching goals of this approach are to reduce mindless eating (through a heightened awareness of one's affect, cognitions, and behaviors when eating), and to maintain a more non-judgmental and flexible attitude towards one's food choices and calorie intake (Kristeller & Wolever, 2011; L. M. Martin et al., 2017). Since mindful eating is designed to maintain healthy eating practices (rather than to endorse dieting or self-critical approaches to food), it is overall a more sustainable and self-compassionate model for various eating interventions to implement (Hazzard et al., 2020).

In an effort to replace the traditional CBT model of food-monitoring with the more mindful approach of monitoring one's appetite, Craighead and colleagues developed the modified CBT intervention model called Appetite Awareness Training (AAT; Craighead, 2006). The AAT essentially keeps the self-monitoring focus of CBT treatment, but it replaces the self-monitoring of food with a self-monitoring of internal hunger and satiety cues (i.e., appetite-monitoring). Initial evaluations of the AAT have found this new intervention type to both promote mindful eating practices and improve disordered eating behaviors at levels comparable to the traditional CBT model (Dicker & Craighead, 2004). The latest adaptation of this AAT model is the mobile intervention called the Mindful Eating Coach (MEC).

3.3 The Mindful Eating Coach (MEC)

The Mindful Eating Coach (MEC) is an app-based mobile intervention on mindful eating. The current version of the MEC is an extension of several iterations that have been tested by the Healthy Eating and Weight Support Lab (HEWS). First developed in 2012, the MEC was designed based on the specific mindful eating strategies outlined in the Appetite Awareness Training (AAT) model (Jones, 2012; Martinez, 2017; Marx, 2016; Smith, 2013). Since the primary goal of AAT is to promote mindful eating, the current MEC app has developed an overall focus on supporting general mindful eating as an adaptive eating pattern (Craighead, 2006; Marx, 2016). To support this aim, the MEC includes appetite monitoring as well as additional "coaching tools" that guide the users through mindful eating practices. Overall, the current MEC intervention has demonstrated significant acceptability in past evaluations, with participants rating the app as highly acceptable, helpful, and easy to use (Marx, 2016). The app has also demonstrated intervention effectiveness with small to moderate effect sizes across various ED outcome measures (Marx, 2016; Martinez, 2017). Thus, over the course of several evaluative studies, the MEC has demonstrated effectiveness in increasing mindful eating while reducing maladaptive eating patterns.

4.1 Introduction to the Study

Research shows that Asian women experience disordered eating as do other racial and ethnic identities, but the overall ED literature on Asian versus Caucasian group differences report significantly mixed findings. Furthermore, the potential for Asian-Caucasian group differences in acceptability of eating interventions remains severely understudied (Smart & Tsong, 2014). To

address this gap in the literature and contribute to growing a more culturally inclusive database, the present study will specifically examine the MEC for its cultural applicability to Asian women. Despite how the MEC has demonstrated its efficacy as a mindful eating intervention, both the development and evaluation of the app involved research that used majority Caucasian female samples. Therefore, the present study will extend the evaluation of the MEC's effectiveness to examine racial identity, specifically pertaining to Asian versus Caucasian group differences.

The cultural applicability of the MEC will be assessed using a total of six different validated measures. The first four will be variables of eating pathology, each measured on the scales of: 1) dietary intent (DIS 1998; a self-report measure of dietary restraint), 2) anorectic cognitions (MAC-R 2000; a measure of one's agreement with beliefs and attitudes that are typical of individuals with eating pathology), 3) preoccupation with eating/weight/shape (PEWS 2002; a measure of one's cognitive preoccupation with eating, weight, and body shape), and 4) binge eating (BES 1982; a measure of one's behaviors, cognitions, and attitudes which relate to binge eating). The fifth measure will be a weight discrepancy score, which will be calculated by subtracting one's ideal weight from their actual weight. Since studies have shown weight discrepancy to be positively associated with eating pathology, the measured weight discrepancy score will be grouped with the other four eating pathology variables under the Aim 1 (baseline) data analysis (Gluck & Geliebter, 2002). The sixth and final measure will be self-compassion (SC), which will be tested as a mediator between the pre- and post-intervention scores for all five eating pathology variables.

4.1.2 Self-Compassion (SC) as a Mediator

Existing ED literature shows that self-compassion has a significant positive association with an improved ability to cope with perceived body-related failures or negative affect (Fresnics et al., 2019; Kelly et al., 2014). As a reduction in maladaptive cognitive strategies is associated with improved ED outcomes, increases in self-compassion (which implies greater levels of self-acceptance) are suggested to raise the effectiveness of eating interventions (Messer et al., 2021; Fekete et al., 2021; de Carvalho Barreto et al., 2020; Serpell et al., 2020). Furthermore, additional studies have found that greater levels of self-compassion are associated with less depressive rumination over one's negative eating and weight concerns (Gordon et al., 2012). Thus, an increase in self-compassion is also looked to as a potential, healthy alternative to a negative coping style of rumination (Fresnics et al., 2019). Overall, given the sufficient literature that reports self-compassion to hold a negative correlation with eating pathology (meaning that an increase in self-compassion is associated with a decrease in disordered eating attitudes and behaviors), we specifically chose to test self-compassion as a mediator across the intervention outcomes on each of our eating pathology measures (Fekete et al., 2021; de Carvalho Barreto et al., 2020).

Self-compassion was also chosen as our mediator variable since it is frequently examined as a mediator or moderator variable in various ED research (Fan & Wang, 2022). Though there is currently very minimal literature on self-compassion as it relates to Asian individuals (especially in relation to their experiences with disordered eating), the few studies that exist on this topic have also mostly studied self-compassion as a mediator or moderator between various attitude and behavior-related variables (Kim et al., 2021; Yu & Chang, 2020; Pisitsungkagarn et al., 2014). For instance, one study specifically found that self-compassion was a significant mediator between emotional self-control and help-seeking attitudes among Asian American college

students. The study concluded that having greater self-compassion may help these students to develop a more positive attitude towards professional counseling (Kim et al., 2021). Another study specifically looked at the moderating role of self-compassion for Thai female adolescents. The results of this study showed that self-compassion significantly moderated the positive relationship between body image satisfaction and self-esteem, suggesting that self-compassion should be further cultivated in these adolescents for more healthy eating and weight-related behaviors (Pisitsungkagarn et al., 2014, p. 333). Overall, the research on self-compassion in relation to Asian individuals is still largely insufficient. However, the growing number of studies examining self-compassion's mediating or moderating effects calls for future research to continue in this direction.

4.2 Individual Study Aims & Hypotheses

Given the numerous mixed findings in the current Asian-Caucasian comparative ED literature, the present study will largely be exploratory. There are a total of four specific aims, and each aim and their corresponding hypotheses are explained in detail below.

4.2.1 Aim 1: Pre-intervention Group Differences on ED variables and Self-Compassion

Aim:

The first aim of this study is to compare Asian and Caucasian participants on their baseline differences for each of the six variables.

Hypothesis 1 (ED Variables):

We predict that Asian participants will score higher than Caucasian participants on all five variables of eating pathology (dietary intent (DIS), preoccupation with eating/weight/shape (PEWS), anorectic cognitions (MAC-R), binge eating (BES), and weight discrepancy).

Rationale (ED Variables):

First, considerable research shows that Asian women on average have lower BMIs and smaller body frames than Caucasian women (Cachelin et al., 2002, 161; Gong et al., 2021; Wang et al., 1994; Bell et al., 2002). Research also shows that there seems to be less variability in BMI in Asian cultures in comparison to Caucasian groups. For instance, one study on obesity found that, as the study population shifted from majority foreign-born Asian individuals to a higher proportion of US-born Asian individuals (i.e., Asian Americans), both BMI and obesity rates increased on a consistent upward trend (Gluck & Geliebter, 2002; Liou & Bauer, 2007, pp. 135-136). Consequently, the group norm for body weight is not only slimmer in Asian cultures than in Caucasian groups, but Asian cultures also seem to have less variability over this norm of low body weight. Combining these findings, then, with the collectivist pressure to "fit in" that is predominant in Asian cultures, we predict that Asian women will score higher on all eating pathology measures as a consequence of trying harder to fit their bodies to the status quo. Research also shows how individuals from collectivist cultures may be more vulnerable to EDs due to this pressure to fit into the norm and to not become an outlier, which further supports our hypothesis (Root, 1990). Additionally, as mentioned earlier in the background (section 1.3.1), Asian women are subject to specific culture-based risk factors (i.e., gendered racial microaggressions, acculturative stress, and help-seeking stigma) to developing disordered eating. Therefore, in comparison to Caucasian women, we predict that Asian women will score higher on all eating pathology variables at baseline.

Hypothesis 2 (Self-Compassion):

We predict that Asian participants will score lower on self-compassion (SC) than Caucasian participants.

Rationale (Self-Compassion):

Having high self-compassion is described as practicing greater self-kindness and acceptance, as well as being able to contextualize one's struggles (and realize that one is not alone in them) rather than isolating in one's feelings of shame or embarrassment (de Carvalho Barreto et al., 2020; Fresnics et al., 2019). Though there is little to no research specifically examining self-compassion in relation to Asian individuals, several studies have found Asian individuals to score higher on public self-consciousness, higher on a tendency for self-concealment (which also reflects a tendency to isolate in one's struggles), and lower on self-esteem (Masuda et al., 2017; Mintz & Kashubeck, 1999; Akan & Grilo, 1995). Since all of these measures (i.e., public self-consciousness, self-concealment, self-esteem) have been specifically associated with eating pathology through prior ED literature, and since all of these reported findings for Asian individuals coincide with a state of low self-compassion, we predict that Asian participants will score lower than Caucasian participants on baseline self-compassion (Masuda et al., 2017; Akan & Grilo, 1995). Furthermore, since collectivist cultures promote more socially driven behaviors rather than acting for oneself, we predict that this will strengthen our hypothesis for lower baseline self-compassion in Asian participants.

4.2.2 Aim 2: Intervention Outcomes

Aim:

The second aim is to compare Asian and Caucasian participants on their pre- to post-intervention improvements across all four eating pathology variables (DIS, PEWS, MAC-R, BES) and self-compassion; the pre- to post-intervention change score for each variable will represent the intervention's effectiveness on that variable over the intervention's duration.

Hypothesis:

We predict that Asian participants will show lower pre- to post-intervention improvements for each of the ED variables and self-compassion than Caucasian participants.

Rationale:

Given the highly conflicting Asian-Caucasian comparative ED literature, we were only able to make a general prediction for the intervention's effectiveness on all variables. Since counseling is not considered to be a part of Asian culture, and since Asian individuals have repeatedly reported less favorable attitudes towards—and the lowest rates of utilizing—counseling services, we predicted that the overall effectiveness of any intervention will be lesser for Asian individuals in comparison to Caucasian individuals (Marbley, 2011; Gilbert et al., 2007; Abe-Kim et al., 2007). In further support of our hypothesis, research has shown that, as an overall cultural group, Asian individuals are highly private and discouraging of displaying emotions and psychological concerns openly. They have also demonstrated less tolerance for stigma associated with seeking professional help, and it is suggested by studies that Asian individuals show a greater tendency for self-concealment to avoid feelings of self-shame (Marbley, 2011; Tylka & Sabik, 2010; Masuda et al., 2017). Thus, we make the same general prediction that, for Asian participants, their pre- to post-intervention change scores across all variables will be lower than those of Caucasian participants.

4.2.3 Aim 3: Self-Compassion as a Mediator

Aim:

The third aim of this study is to examine for differences in self-compassion's mediator effects between the two racial identities (Asian versus Caucasian). Self-compassion will be evaluated as a mediator between the pre- to post-intervention outcomes for all variables.

Hypothesis:

Given the lack of sufficient ED literature on self-compassion in relation to Asian individuals, we intend for this aim to be exploratory and therefore do not make any predictions on the outcomes.

4.2.4 Aim 4: App Acceptability

Aim:

The fourth and final aim of this study is to conduct both a quantitative and qualitative comparison of app acceptability between Asian and Caucasian participants. The quantitative analysis will take the form of comparing acceptability rating scores, and the qualitative analysis will take the form of comparing written feedback on the intervention.

Hypothesis:

We predict that Asian participants will show both lower acceptability ratings and less positive feedback on the intervention than Caucasian participants.

Rationale:

Using the same rationale as in Aim 2, we predict that Asian individuals' greater help-seeking stigma and less favorable attitudes towards treatment will lead to self-reports of lower app acceptability compared to Caucasian participants.

Methods

This study analyzes existing data from the Healthy Eating and Weight Support (HEWS) laboratory led by Dr. Linda Craighead at Emory University. The data was collected as part of a master's thesis, *Evaluation of a Mindful Eating Mobile Intervention* (2021), written by Brittany Robbins. Relevant variables have been extracted from the larger dataset to address the aims of this study.

Participants

Participants in the parent study were 189 young adult females aged 18 to 30; for this study, data analysis was conducted with a subset (n=133) of the total sample, comprised of participants who self-identified as either Asian (n=39) or Caucasian (n=94). Participants were recruited via university student listservs, flyers posted within and around campus, and announcements made in college courses with permission of instructors. Announcements and emails described the study as a research study recruiting volunteers with eating and/or weight concerns to assess the efficacy of a mindful eating electronic app. Individuals interested in participating were instructed to contact the researchers for additional information.

Prospective participants were sent an email including a screening questionnaire and a brief overview of the study; the study was described as assessing a brief mobile mindful eating intervention designed to help young women develop healthier relationships with food and eating. The listed commitments of the study were two laboratory visits plus an additional one-time completion of feedback questionnaires at home. Interested individuals were also informed that this mobile intervention was not considered to be an appropriate stand-alone treatment for those

with clinically significant eating concerns and were provided with referrals for university and community treatment providers.

To determine study eligibility, individuals who received the study description and still expressed interest were asked to complete and return the screening questionnaire via email. Eligibility criteria included: current Emory undergraduate or graduate student between the ages of 18-30, use of an iPhone with an operating system of iOS 8.0 or greater, endorsing concerns with eating/weight/body shape, interest in using a mindful eating app, consent to random assignment, and a willingness to not use any other eating/weight apps (i.e., apps for calorie counting, weight management, eating practices) for the duration of the study. Potential participants were also instructed to sign a screening consent form that was attached to the questionnaire. The screening questionnaire included questions about contact information, date of birth, sex, race/ethnicity, year in school, extent of concern with weight/eating, and prior treatment for weight management and/or disordered eating. Those eligible for the study were then scheduled for two laboratory visits.

Compensation for participants included a $30 gift card sent via email after completion of the second laboratory visit. An additional $20 gift card was sent via email after completion of the follow-up questionnaire. Procedures are described in detail in the following sections. All study procedures were approved by the Emory University Institutional Review Board.

Self-Report Measures

The following self-report measures were obtained from participants either during screening or subsequent study visits.

Demographics and history. Participants were asked to provide demographic information including their date of birth, racial/ethnic identity, self-reported height and weight (including weight history), past/present ED diagnosis (if applicable); experience with mindfulness meditation and mindful eating, past/present use of health/diet/weight loss apps, and reasons for signing up for the study.

Measures of eating pathology. The following measures assessed eating pathology at all three time points (V1, V2, and follow-up) in the parent study and will be used to examine improvements in eating pathology over the course of study participation.

Dietary Intent Scale (DIS; Stice, 1998). The DIS is a 9-item self-report measure of dietary restraint and includes three subscales: consumption of low-calorie foods, reduced food intake, and abstaining from eating. Items are rated on a 5-point scale from 1 ("Never") to 5 ("Always"). Higher scores on the DIS denote more severe dietary restraint. Data demonstrate high internal consistency (α's = 0.93-0.94) and 1-month test-retest reliability (r = .92) of the DIS total score and subscales; the measure has also been found to predict a behaviorally-based measure of caloric intake (Stice, 1998).

Mizes Anorectic Cognitions Questionnaire -- Revised (MAC-R; Mizes, 2000). The MAC-R is a 24-item abbreviated version of the original MAC (Mizes & Klesges, 1989) and is intended to measure agreement with beliefs and attitudes typical of individuals with eating pathology. Items are rated on a 5-point Likert scale ranging from 1 ("Strongly disagree") to 5 ("Strongly agree"). The MAC-R yields a total score as well as scores on four subscales: Appearance, Weight, and Approval; Self-Control of Eating and Self-Esteem; and Rigid Weight Regulation and Fear of Weight Gain. Previous research has demonstrated good psychometric properties, including high internal consistency a=.90).

Binge Eating Scale (BES; Gormally et al., 1982). This 16-item self-report measure is used to assess behaviors (e.g., bingeing), cognitions (e.g., preoccupation with food), and feelings (e.g., guilt) related to binge eating. Total scores range from 0 to 46, with higher scores indicating more severe cognitions, behaviors, and feelings related to binge eating. Severe binge eating is typically indicated by scores ≥ 27, whereas scores ≤ 17 suggest mild (or absent) binge eating (Greeno et al., 1995). Test-retest reliability is good (r = .87; Timmerman, 1999) and internal consistency is high (α = .85; Gormally et al., 1982).

Preoccupation with Eating, Weight, and Shape Scale (PEWS; Craighead & Niemeier, 1999; Craighead et al., 2002). This 8-item self-report measure, adapted from the Modifying Distressing Thoughts Questionnaire (Clark et al., 1989), is used to assess cognitive preoccupation with food/eating and weight/shape. The PEWS consists of two subscales: preoccupation with food/eating and preoccupation with weight/shape. Respondents rate on a scale from 1 ("Not at all") to 6 ("Extremely") how distressing their thoughts are, how difficult they are to stop, and how much they interfere with concentration. Scores are then averaged to obtain separate subscale scores as well as a PEWS total score. Higher scores indicate greater cognitive preoccupation with food/eating and weight/shape. Preliminary analyses suggest adequate convergent validity, discriminant validity, sensitivity to change, and internal consistency (α = .84; Niemeier et al., 2002).

Weight Discrepancy Score. This score is a measured difference between a participant's self-reported ideal versus actual weight (the ideal weight is subtracted from the actual weight).

Measures of Mediators. The following measure was used to assess a hypothesized mediator for changes in pre- to post-intervention scores on eating pathology.

Self-Compassion Scale (SCS; Neff, 2003). The SCS is a 26-item self-report measure of individuals' self-compassion. Items are rated on a 5-point Likert scale ranging from 1 ("Almost never") to 5 ("Almost always"). The measure yields a total score as well as scores on six subscales: self-kindness, self-judgment, common humanity, isolation, mindfulness, and over-identification. Higher scores indicate greater self-compassion. Previous research has identified the measure as having good internal consistency (a=.92), test-retest reliability (ICCs=.80-.93), and both construct and predictive validity (Neff, 2003).

Procedure

Participants attended two laboratory visits that were held approximately three weeks apart; each session lasted for about 30 to 60 minutes. Three weeks after the second visit, participants were sent a link for an online follow-up questionnaire.

Visit 1. After providing written informed consent in the lab, participants were asked to complete questionnaires via the Qualtrics survey platform assessing eating pathology (i.e., binge eating (BES), anorectic cognitions (MAC-R)), general trait mindfulness, mindful eating, eating disorder history, and prior use of any related mobile interventions. Participants were randomly assigned to either the mobile intervention group (MI) or a waitlist control (WC) group using a random number generator. Those assigned to the waitlist control group were asked to return in 3 weeks to receive the intervention while those assigned to the mobile intervention group were given instructions for using the app and asked to return in 3 weeks. All participants were reminded of their next visit as well as their agreement to refrain from using other related apps/interventions.

Visit 2. Participants completed the same questionnaires from visit 1. At this time, participants in the mobile intervention group had used the app for a total of three weeks. Participants in the waitlist control group were provided instructions for using the app. All participants were reminded of their agreement to refrain from using other related apps/interventions as well as to complete a final assessment in 3 weeks.

Follow-up Assessment. Three weeks after their second study visit (six weeks since their entry into the study), participants received an email with a link to complete follow-up questionnaires online via Qualtrics. Questionnaires administered at follow-up were identical to those administered at visits 1 and 2. Upon confirming receipt of data from the app and online questionnaires, a research staff member emailed compensation (a $20 electronic gift card) directly to the participant. This concluded all individuals' study participation.

Data protection and participant privacy. Appropriate steps were taken to preserve participant anonymity and privacy, including the use of anonymous subject identification numbers and secure storage of all electronic and paper data.

Intervention Conditions

Mobile Intervention condition. Participants in the mobile intervention condition received the Mindful Eating Coach (MEC) app and were given instructions on its use during their first visit. Participants were also given written materials that described the rationale and practice of mindful eating as well as reviewed the use of the various tools within the mindful eating app. They were then asked to demonstrate the use of the MEC to ensure they had understood the instructions; any questions regarding the app's purpose or use were answered by research staff. Participants were also directed to the Craighead Lab website for additional

material on mindful eating and MEC use (http://craigheadlab.weebly.com/mindful-eating-coach-app.html). Participants were encouraged to contact the research staff with any questions or issues that might arise during their use of the app. After the second visit, individuals in the mobile intervention condition were informed that they were not required to use MEC for the next three weeks (until the follow-up assessment) but could continue using it as desired.

Waitlist Control condition. Participants in the waitlist control condition received no intervention during the first three weeks of the study (i.e., the weeks between visit 1 and visit 2). At visit 2, participants received the MEC app with instructions in a procedure identical to that given at visit 1 for the mobile intervention condition. At the end of the visit, participants were asked to use the app to practice mindful eating for the next three weeks (i.e., the weeks between visit 2 and the follow-up assessment).

The "Mindful Eating Coach" (MEC)

The Mindful Eating Coach (MEC) app was designed to prompt participants to "self-coach" their eating; the app asks participants to rate their appetite and mindfulness for each eating episode, as well as to note what went well or would be useful to remember next time. For additional coaching resources, participants were also given written psychoeducational material drawing from existing literature on mindful eating and appetite monitoring (Craighead, 2006; Kristeller et al., 2014; Mathieu, 2009; Rossy, 2012). Included in the app itself are five "coaching tools": coaching alerts, appetite ratings, mindfulness ratings, lessons, and history. All of these coaching tools are intended to help scaffold the participants' practice of mindful eating. Each tool is described in greater detail below:

Coaching alerts. This intervention utilizes reminders, or "coaching alerts," that prompt participants to practice mindful eating at various points during the day. These alerts are intended to scaffold the practice of mindful eating until it becomes automatic. In this study, alerts were set via the "Calendar" app available on all iPhones. Alerts appeared as notifications on the lock screen of users' iPhones; they remain on the screen until the user dismisses them or performs another function on their iPhone. Participants were asked to choose four alerts that corresponded with their personal goals from a list of 18 provided by the researchers; these pre-written alerts were written to be consistent with the psychoeducational material provided. Participants were encouraged to set an alert for first thing in the morning and then at three other times during the day. Participants were instructed to have four alerts set for the duration of their required use of the app, but they were informed that they could change the timing and the content of these alerts anytime, as desired.

Appetite ratings. Appetite ratings are the app's primary tool and prompt users to electronically rate the level of their hunger and fullness before and after eating.
These ratings are one of three tools that participants were instructed to use each time they ate. The use of appetite monitoring draws upon practices from Appetite Awareness Training (AAT; Craighead, 2006), a clinical intervention demonstrated to reduce concerns about overeating for different populations with problems related to disordered eating (Allen & Craighead, 1999; Craighead & Allen, 1995; Dicker & Craighead, 2004). In the app, appetite ratings are made on a visual analog scale that ranges from "Too Hungry" to "Too Full". The scale used in the app mimics the 7-point written Likert scale originally developed as part of AAT. The scale is color-coded such that the extremes of the scale are red, which fades to orange and then becomes green in the middle of the scale; participants are informed that their goal is to "stay in the green," that

is to avoid waiting until they are too hungry to eat and not to eat beyond the point of moderate fullness (not get too full). Participants were instructed to rate their appetite before and after each eating episode, with the intention of helping them attend to internal hunger and satiety cues and use this information to guide their eating decisions.

Mindfulness ratings. After the participant rates hunger and fullness, they are asked to rate how mindful they were while eating. These mindfulness ratings utilize three icons: participants select the "sunny" icon if they felt they were able to stay mindful while eating, the "partly cloudy" icon if they felt they were only partly mindful, and the "cloudy" icon if they had difficulty staying mindful. These ratings, along with the lessons described below, are intended to increase users' awareness of their ability to eat mindfully, reinforce progress, and identify areas for improvement.

Lessons. Finally, after completing mindfulness ratings, users can identify lessons they would like to remember from that eating episode. If the user indicates that she ate mindfully, she is asked to indicate what went well by selecting items from a pre-written list (e.g., "Didn't wait and get too hungry," or "Ate slowly"). If the user indicates that she had difficulty eating mindfully, she is asked to indicate what she would like to remember to do differently next time by selecting items from a pre-written list (e.g., "Plan ahead to avoid getting too hungry," or "Remember foods or amounts that didn't feel good"). Users also have the option to type in personal lessons in addition to selecting from the provided options; these personal lessons are compiled in a list under the app's history tool for later viewing. The goal of this tool is to help users learn from their past eating experiences rather than becoming self-critical or feeling guilty. Negative judgements/feelings are hypothesized to interfere with the accurate processing of and subsequent recall of important information. As noted earlier, theories of self-compassion propose

that the reduction of shame and self-criticism allows individuals to process negative information without becoming overwhelmed by it or losing their motivation to change (Neff, 2003a, 2003b).

History. The history tool allows users to track their progress with the aid of several graphs. These graphs utilize data from the user's past appetite and mindfulness ratings and allow the user to monitor her progress over time and identify new goals.

Additional coaching resources. The psychoeducational material on mindful eating and the use of the app remains available to users throughout the intervention via the app's "coaching" tab. This allows users to refer back to this material on an as-needed basis. Additionally, participants were informed of the availability of supplemental information available on the Craighead Lab website. This supplementary information included a description of the difference between mind*ful* and mind*less* eating, an explanation of how mindful eating differs from traditional dieting, instructions on how to adapt self-coaching for personal eating and weight goals, and an example of a day of successful "self-coaching" using the app.

Data Preparation

Out of the total participant sample in the parent study (N=189), 154 participants identified as either Asian (A; n=43) or Caucasian (C; n=111). A total of 21 participants were excluded from the analyses for failure to complete all questionnaires for an entire visit (15 failed to complete questionnaires from visit 3 and 6 failed to complete all questionnaires from both visits 2 and 3). Thus, data from a total of 133 participants (N_A=39, N_C=94) were included in the pre- and post-intervention outcome analyses. In addition, 15 participants failed to complete the acceptability measures and were excluded from the app acceptability analysis. Values for specific measures were imputed if a participant had missed less than 25% of that questionnaire.

Sample demographics and baseline group differences were examined across all participants with pre-intervention measures (*N*=154). Weight discrepancy was calculated by subtracting ideal weight from actual weight. Change scores for the disordered eating (i.e., binge eating, anorectic cognitions, dietary intent, and preoccupation with food/weight) and self-compassion measures were computed by subtracting visit 1 scores ("pre") from visit 3 ("post") scores for each measure.

Analyses

All analyses were performed using SPSS version 26. In order to assess for baseline differences between racial identity groups across all variables (i.e., DIS, PEWS, MAC-R, BES, weight discrepancy, and SCS), independent samples t-tests were conducted. Correlation analyses were used to examine baseline correlations among all six variables. To evaluate racial identity group differences in intervention response, two-way repeated-measures ANOVAs were conducted to examine pre- to post-intervention changes in the four ED outcome variables (DIS, PEWS, MAC-R, and BES) and self-compassion. Because no significant group differences (Time*Group) were found, data from both racial identity groups were combined for the subsequent analyses to maximize power. Correlation analyses were used to examine whether pre-post changes in self-compassion were associated with pre-post changes in eating pathology. Linear regression analyses were used to examine post-intervention self-compassion as a mediator of change in binge eating, preoccupation, and anorectic cognitions from pre- to post-intervention. Finally, racial identity group differences in app acceptability were assessed using independent samples t-tests on participant's ratings of specific questions about their experience using the app.

Results

Demographics. Sample demographics for the 154 participants who were originally enrolled in the study are summarized in Table 1.

Study retention. Overall, study retention was high (86.3%), 133 out of 154 participants completing post-intervention measures (N_A=39, N_C=94). There were no differences between the racial identity groups in the total number of dropouts ($X^2_{(1, N=154)}$=.717, p=.397).

Baseline group differences. One-way analyses of variance (ANOVAs) revealed no baseline differences between the Asian and Caucasian groups in age ($F_{(1, 152)}$=3.02, p=.06) or baseline BMI ($F_{(1, 151)}$=.003, p=.96). Chi-square analyses additionally revealed no differences in experience with mindfulness/meditation ($\chi^2_{(1, N=154}$=1.09, p=.30), experience with mindful eating ($\chi^2_{(1, N=154)}$=1.39, p=.24), past self-monitoring experience ($\chi^2_{(1, N=133)}$=1.23, p=.26), history of past eating- or weight-related treatment ($\chi^2_{(1, N=154)}$=1.34, p=.45), or past self-monitoring ($\chi^2_{(1, N=154)}$=.611, p=.51). Fisher's exact test was used where the assumptions of Chi-square analyses were violated and indicated that the groups did not differ in history of past ED diagnosis (p=.47, *FET*). The groups also did not differ on any of the measures of disordered eating (all p's>.1).

Preliminary Analyses. To first test for differences between the two racial identity groups depending upon time of app use (the first three weeks for participants who used the app between visits 1 and 2 and the second three weeks for those who used the app between visits 2 and 3), 2x2 ANCOVAs were conducted on the post-test scores for the total sample (N=133), using pre-intervention scores (Visit l) as a covariate. ANCOVAs revealed no significant effects by time of use between groups for any of the five outcome measures (SCS, PEWS, MAC-R, DIS, or BES). Thus, for subsequent analyses, the two waves of intervention were combined, providing greater

power to investigate ethnic group effects. Visit 1 scores were used as baseline measures for all participants. Visit 3 scores were used as post-intervention scores for all participants.

Pre-intervention Group Differences

Pre-intervention variable means for both racial identity groups are summarized in Table 2.

Eating pathology. We predicted that Asian participants would report significantly greater levels of disordered eating and weight discrepancy at baseline than Caucasian participants. Independent samples t-tests revealed no significant differences between groups on pre-intervention dietary intent (t_{131}=1.286, p=.201), preoccupation (t_{131}=-1.295, p=.201), anorectic cognitions (t_{131}=1.505, p=.135), binge eating (t_{131}=.228, p=.820), or weight discrepancy (t_{126}=1.592, p=.114).

Self-compassion. We predicted that Asian participants would report significantly lower levels of self-compassion at baseline than Caucasian participants. An independent samples t-test revealed no significant differences between groups on pre-intervention self-compassion (t_{131}=-.478, p=.634).

Correlations among variables at baseline. We examined the relationships among measures of eating pathology and self-compassion at pre-intervention for the combined sample (N=133). Pearson correlations revealed significant associations among all of the eating pathology variables (including weight discrepancy) (all p's<.001). Self-compassion was significantly associated with preoccupation, anorectic cognitions, and binge eating, but not with dietary intent or weight discrepancy. Correlations are summarized in Table 3.

Intervention Outcomes

Variable means at pre- and post-intervention for the Asian and Caucasian groups are summarized in Table 4.

Eating pathology. We predicted that there would be an overall poorer intervention response on measures of eating pathology for Asians compared to Caucasians. Repeated-measures ANOVAs revealed a significant effect of Time (pre to post) for dietary intent ($F_{(1,131)}$=4.757, p=.031), anorectic cognitions ($F_{(1,131)}$=15.412, p<.001), binge eating ($F_{(1,131)}$=32.087, p<.001), and preoccupation ($F_{(1,131)}$=72.7507, p<.001). However, there were no significant effects of Time*Group for any of the eating pathology outcome variables.

Self-compassion. We predicted that Caucasians would show greater pre- to post-intervention improvements in self-compassion compared to Asians. Repeated-measures ANOVAs revealed a significant effect of Time (pre, post) for self-compassion ($F_{(1,131)}$=31.897, p<.001), but there was not a significant effect of Time*Group.

Correlation between changes in self-compassion and eating pathology. We examined whether improvements in self-compassion were associated with reductions in eating pathology for the combined sample. Pearson correlations revealed that pre-intervention to post-intervention changes in self-compassion were associated with changes in anorectic cognitions ($r_{(132)}$=-.552, p<.001), binge eating ($r_{(132)}$=-.223, p=.011), and preoccupation ($r_{(132)}$=-.245, p=.005), but not with dietary intent ($r_{(132)}$=-.122, p=.162).

Self-Compassion as a Mediator

A series of regression analyses were conducted following the Baron and Kenny (1986) method to examine whether self-compassion at post-intervention mediated changes in preoccupation, anorectic cognitions, and binge eating between pre-intervention and post-intervention. Given that changes in self-compassion were not related to changes in dietary intent, self-compassion was not evaluated as a mediator for this variable. The regression analyses were

conducted using participants who completed all four measures (SCS, PEWS, MAC-R, and BES) at all three time points.

For PEWS, simple regression analyses first demonstrated that pre-intervention PEWS was a significant predictor for both post-intervention PEWS ($F_{(1,131)}$=84.60, p<.001, R^2=.39) and post-intervention SCS ($F_{(1,130)}$=17.76, p<.001, R^2=.12). Second, simple regression analysis demonstrated that post-intervention SCS significantly predicted post-intervention PEWS ($F_{(1,130)}$=26.07, p<.001, R^2=.17). Lastly, multiple regression revealed that post-intervention SCS significantly predicted post-intervention PEWS (β=−.357, $t_{(129)}$=-3.07, p=.003) and explained an additional 4.1% of the variance in PEWS at post-intervention ($F_{(2,129)}$=50.50, p<.001, R^2=.44), when controlling for pre-intervention PEWS.

For MAC-R, simple regression analyses first demonstrated that pre-intervention MAC-R was a significant predictor for both post-intervention MAC-R ($F_{(1,130)}$=153.49, p<.001, R^2=.54) and post-intervention SCS ($F_{(1,130)}$=20.63, p<.001, R^2=.14). Second, simple regression analysis demonstrated that post-intervention SCS significantly predicted post-intervention MAC-R ($F_{(1,129)}$=39.38, p<.001, R^2=.23). Lastly, multiple regression revealed that post-intervention SCS significantly predicted post-intervention MAC-R (β=-4.59, $t_{(128)}$=-4.13, p<.001) and explained an additional 5.4% of the variance in MAC-R at post-intervention ($F_{(2,128)}$=93.63, p<.001, R^2=.59), when controlling for pre-intervention MAC-R.

For BES, simple regression analyses first demonstrated that pre-intervention BES was a significant predictor for both post-intervention BES ($F_{(1,129)}$=109.09, p<.001, R^2=.46) and post-intervention SCS ($F_{(1,130)}$=13.41, p<.001, R^2=.09). Second, simple regression analysis demonstrated that post-intervention SCS significantly predicted post-intervention BES ($F_{(1,128)}$=24.06, p<.001, R^2=.16). Lastly, multiple regression revealed that post-intervention SCS

significantly predicted post-intervention BES (β=-2.43, $t_{(127)}$=-3.22, p=.002) and explained an additional 4.1% of the variance in BES at post-intervention ($F_{(2,127)}$=62.60, p<.001, R^2=.50), when controlling for pre-intervention BES.

App Acceptability

To examine group differences between Asian and Caucasian participants on how acceptable they found the intervention to be, we conducted both a quantitative and qualitative comparison of app acceptability. The quantitative analysis compared acceptability rating scores, and the qualitative analysis compared written feedback on the intervention.

For the quantitative analysis, five questions that most directly addressed helpfulness and usefulness were selected from the full acceptability questionnaire. Question 1 asked, "How helpful did you find the app overall?"; the question was measured on a scale of 1 ("not at all helpful") to 5 ("very helpful"). Questions 2-4 ("The app was a positive way to address my eating and/or weight concerns," "Using the app reduced the distress and negative emotions (e.g., guilt, regret) I experience related to eating," and "I would recommend this app to other young women with similar problems or concerns") prompted participants to select the value that best describes their experience of using the app on a scale of 1 ("disagree") to 5 ("agree"). Question 5 ("While using the app, how helpful would it have been for you to have met or talked several times with a counselor or therapist?") was measured on the same scale as the first question. Racial identity group differences for these questions were evaluated with independent samples t-tests.

Independent samples t-tests then revealed that there were no significant differences between Asian and Caucasian participants on any of the five acceptability questions. Thus, there were no racial identity group differences in reported app acceptability. Table 5 summarizes the Asian versus Caucasian group statistics for each of the acceptability questions.

For the qualitative analysis, written feedback from Asian and Caucasian participants were compared. The perusal of open-ended comments did not suggest differences between the two groups' feedback responses.

Discussion

The present study evaluated the cultural applicability of a brief (i.e., three-week) mobile intervention on mindful eating, called the Mindful Eating Coach (MEC), specifically for Asian women. Cultural applicability was assessed through evaluations of group differences between Asian and Caucasian women on their use of the MEC app. Measures of eating pathology (i.e., dietary intent (DIS), preoccupation with eating/weight/shape (PEWS), anorectic cognitions (MAC-R), and binge eating (BES)), weight discrepancy (the difference between one's ideal versus actual weight), and self-compassion (SCS) were all used to explore group differences in baseline eating attitudes and intervention effectiveness. The study had four aims:

Aim 1: Pre-intevention Group Differences on ED variables and Self-Compassion

The first aim of this study was to compare Asian and Caucasian participants on their baseline differences across all variables of eating pathology and self-compassion. We first predicted that, for all variables of eating pathology (which also included weight discrepancy for the baseline comparison), Asian participants would score significantly higher than Caucasian participants on each measure. However, contrary to our hypothesis, no significant group differences were found on any of the pre-intervention measures of dietary intent, preoccupation with eating/weight/shape, anorectic cognitions, binge eating, and weight discrepancy. Similarly, contrary to our prediction that Asian participants would report significantly lower levels of baseline self-compassion than Caucasian participants, there was no significant group difference

found on pre-intervention self-compassion. This overall lack of significant baseline group differences between the two racial identities closely reflects the currently mixed literature on Asian-Caucasian ED differences. A relatively equal number of studies report Asian women as exhibiting higher levels of eating pathology as those that report opposite findings or no significant group differences between the two racial identities (Smart & Tsong, 2014). One explanation for the inconsistent ED literature on Asian women is the lack of relevant studies, as well as high variability in study methodologies. Additional factors such as using small convenience samples and measures that are not validated for Asian women are cited as common concerns (Smart & Tsong, 2014; Cummins et al., 2005, p. 565). Though the current study used validated measures from previous ED research, the development of new, more culturally applicable measures for Asian women can be an area of further investigation. Overall, there is a significant need for more cross-cultural studies to come to any conclusions about ED symptoms for Asian individuals.

The insignificant group differences across all baseline ED and self-compassion measures may also be due to specific sample limitations in this study: participants were recruited from within and around Emory University's campus, which generally implies that individuals were fairly acculturated to the same community culture and weight ideals. Also worth noting is that the majority of participants (82.5%) reported that English was their first language, which further implies that the Asian participants in this study were relatively acculturated to typical Western patterns of thought and behavior. Additionally, the use of a community sample at a prestigious university suggests that all participants uniquely shared the same educational level, access to educational resources, living conditions, cultural norms and values, food options, and other key environmental influences on eating experiences. Therefore, there may have been very few

cultural differences between the Asian and Caucasian participants in this sample despite how they reported different racial identities. Specifically related to eating, being a part of the same environment and campus culture could have reduced any pre-existing, race-based differences. As Orji explains, "People within a particular community often share common markets, restaurants, and foods…once ingrained into a culture, eating behaviors then become a way of expressing cultural identity" (Orji & Mandryk, 2014, p. 209). Thus, the specific sample used for this study may have exhibited less cultural differences in eating behaviors given its unique immersion into the college environment.

A third potential explanation for the lack of group differences on baseline eating pathology and self-compassion relates to the collectivist mindset that is believed to be more common in Asian cultures. Since individuals from collectivist cultures typically value adjusting to the norms of the larger group, it is possible that they also adjust their attitudes and behaviors based on the most proximate cultural group that they belong to. Studies on this topic have shown that collectivist individuals are less consistent in their attitude-behavior patterns as they adjust them in favor of group benefit (Orji & Mandryk, 2014; Khaled et al., 2006; Tao, 2005). Thus, the Asian participants in the present study may have already adjusted their eating attitudes and behaviors to fit the Western norms of their immediate college community. Unfortunately, the current study did not assess collectivist mindset.

Aim 2: Intervention Outcomes

Our second aim was to compare Asian and Caucasian participants on their pre- to post-intervention improvements across all four eating pathology variables (DIS, PEWS, MAC-R, BES) and self-compassion. Though we had predicted that Asian participants would show less pre- to post-intervention improvement across all measures, our results showed that the

intervention was not differentially effective for Asian and Caucasian participants. Furthermore, when grouped together, both Asians and Caucasians showed equal improvements on anorectic cognitions, binge eating, preoccupation, dietary intent, and self-compassion. Thus, we combined the two groups for further analyses. A notable observation from the correlational results was that improvement in self-compassion (pre- to post-intervention change) was associated with improvement in anorectic cognitions, binge eating, and preoccupation, but it was not associated with decreased dietary intent.

These findings demonstrated the MEC's overall effectiveness for the total sample. Though there were no group differences found between Asians and Caucasians, the intervention was effective on all measures for the whole participant sample. Specifically for self-compassion, our correlational analyses demonstrated that improved self-compassion is associated with reductions in anorectic cognitions, binge eating, and preoccupation, but not with dietary intent.

Aim 3: Self-Compassion as a Mediator

The initial third aim of this study had been to determine if self-compassion might serve as a mediator of the effects on eating disorder symptoms. However, given that our previous analyses showed that the intervention was not differentially effective for Asian and Caucasian participants, the two samples were also combined for these analyses. Since the previous results showed that changes in self-compassion were not related to changes in dietary intent, self-compassion was not evaluated as a mediator for this variable. The following sets of our regression analyses, then, showed that self-compassion was a significant mediator for predicting post-intervention scores of anorectic cognitions, binge eating, and preoccupation.

The current study's findings suggest that self-compassion significantly improved participants' *distress* over eating. The measures of anorectic cognitions, binge eating, and

preoccupation all reflect some level of cognitive distress in relation to food. Self-compassion's significant mediating effects for these variable outcomes suggest that increasing self-compassionate practices (such as greater self-acceptance and less depressive rumination over eating concerns) can help to alleviate disordered eating symptoms that specifically relate to cognitive distress. On the other hand, our results suggest that increased self-compassion does not significantly impact individuals' *drive* to practice certain eating behaviors. Since self-compassion did not significantly correlate with, nor mediate for, dietary intent, this implies that self-compassion was unable to impact the drive that individuals had towards restricting their food intake.

These findings on self-compassion's mediating effects align with existing literature on both clinical and subclinical treatments for disordered eating. In the case of dietary intent, previous research shows that it is particularly more difficult to treat in comparison to other eating concerns. Although explanations for these findings are mixed, the difficulty of treating dietary intent is often attributed to the many subconscious processes that can be involved in motivating restrictive behavior, as well as to the difficulty of targeting such processes behaviorally (Stice et al., 2010; Dochat et al., 2019). Thus, in the context of the present study, self-compassion may not have significantly mediated dietary intent because of the short duration of our intervention. Since the intervention lasted only three weeks, it is likely that this was not enough time to significantly effect individuals' level of dietary intent. Another potential explanation for this finding is that dietary intent may specifically have a closer relation to culture. If specific cultural ideals substantially impact one's level of dietary intent, then self-compassion on its own may not be enough to improve one's dietary behaviors. Overall, this study provides an impetus for further research into self-compassion's specific relationship to dietary intent.

Aim 4: App Acceptability

The fourth and final aim of this study was to conduct both a quantitative and qualitative comparison of app acceptability between Asian and Caucasian participants. The quantitative analysis took the form of comparing acceptability rating scores, and the qualitative analysis was conducted by comparing written feedback from participants. For both our quantitative and qualitative analyses, we predicted that Asian participants would report lower acceptability ratings than Caucasian participants. The rationale behind our hypothesis was broadly based on Asian individuals' reportedly more negative attitudes towards help-seeking and professional treatment compared to Caucasian individuals. However, this hypothesis was not supported. The quantitative results revealed that there were no significant differences between Asian and Caucasian participants on any of the five acceptability questions, and the qualitative results similarly revealed no racial identity group differences in written feedback. Furthermore, the qualitative results generally demonstrated a wide range of positive responses from both groups. A potential feedback worth noting is that several of the participants (both Asian and Caucasian women) wished to receive less daily "coaching alerts" for future iterations of the MEC. However, overall, the written responses across both groups were very similar.

Despite the lack of group differences found in the app acceptability ratings as well as in the overall intervention outcomes, the findings did support the efficacy of the intervention for *both* racial identities. As demonstrated in Aim 2, the participant sample as a whole showed significant pre- to post-intervention improvements for anorectic cognitions, binge eating, preoccupation, and dietary intent. Therefore, Asian participants in this study demonstrated equal levels of improved intervention outcomes and positive acceptability ratings as their Caucasian counterparts. Given the extensive literature on Asian culture's unfavorable attitudes towards

help-seeking and professional treatment, the absence of any race-based group differences in treatment response—along with Asian participants' significant improvement on all eating pathology variables—can be a positive indicator that this type of intervention may be quite acceptable to Asian individuals.

The absence of Asian versus Caucasian differences in the MEC's effectiveness may also demonstrate the specific acceptability of a *mobile* intervention in addressing the concerns of Asian individuals. As previously stated, research suggests Asian individuals demonstrate less tolerance for the stigma associated with seeking professional psychological services, as well as less interpersonal openness about psychological concerns compared to White American subjects (Tylka & Sabik, 2010; Masuda et al., 2017). These culturally founded, less favorable attitudes toward professional interventions can also affect Asian individuals' treatment experiences when they require face-to-face and/or other forms of social interaction. For instance, Japanese counselor and psychologist Makiko Kasai explains how, due to "the collectivists' emphasis on harmony within the in-group[,] saving the face of the other, avoiding conflict, and 'smoothing out' interactions with others," a client in therapy who is presented with ideas different from their own will "tend to agree with the therapist to save the therapist's face and maintain the relationship" (Gerstein et al., 2009, 167). Another source explains how Asian individuals are typically discouraged within their cultures from openly displaying their emotions, which can negatively affect their specific experiences with initiating and maintaining professional counseling (Marbley, 2011). In the face of such complex cultural considerations for the treatment of Asian individuals, *mobile* interventions provide an alternative that may reduce the nuanced elements of social interaction. Since mobile interventions do not explicitly incorporate one's racial identity into a socially interactive experience, they may prove to be a uniquely applicable

and effective intervention strategy for Asian individuals. Furthermore, given the mobile app format of the MEC intervention, Asian individuals may view the MEC as a more psychoeducational and approachable tool for addressing their eating concerns (as opposed to a form of therapy or counseling). The present study should inform future research to be done on comparing Asian individuals' responses to mobile versus socially interactive interventions.

Limitations and Future Directions

A notable limitation to this study was the use of a pre-collected sample—relevant variables were extracted from the larger dataset of a parent study. Therefore, this study was not able to increase power by recruiting more Asian participants than the thirty-nine individuals who completed the original intervention. Additionally, for the present study, no acculturation measures were incorporated in the overall assessment of MEC's cultural applicability for Asian participants. Research shows, however, that it is critical for acculturation measures—along with other measures of intersectionality—to be more consistently incorporated in examining Asian American women and their disordered eating behaviors (Le et al., 2020). Since Asian American women may adapt differently to the combination of cultures represented by their upbringing in America and their family of origin, acculturative measures may be quite important in understanding the wide range of responses across Asian American women. Thus, future studies may also do well to cross-culturally compare the effects of acculturation for Asian women living in heterogeneous cultures (i.e., America) versus those who are living in more homogenous, Asian countries.

Another limitation of this study is that it did not specifically address the significant intragroup differences that exist within the larger Asian racial identity. Though collectivism is often hypothesized to be a defining factor of all Asian cultures, it is important to note that there

are various other dimensions on which collectivistic cultures differ from one another (Gerstein et al., 2009, p. 160). At the most fundamental level, the significant ethnic diversity within the Asian identity needs to be more specifically considered. Asia is the world's largest continent with about thirty-seven countries and an additional fourteen Arab nations. Therefore, Asian identity cannot easily be considered homogenous (Marbley, 2011, p. 50).

As of now, a select number of studies have examined these Asian ethnic intragroup differences as they relate to eating and weight concerns. For instance, traditional Chinese, Indian, and Arabic cultures have been found to prefer plumpness in women whereas Japanese culture has been found to emphasize thinness in their feminine beauty standards (Orji & Mandryk, 2014, p. 210). However, the current ED literature on different Asian ethnic identities reports highly inconsistent results, with different methodological designs cited as a primary source of concern (Ponterotto et al., 2010, p. 253). There also seem to be considerable international differences in definitions of the "Asian" racial identity. For instance, the majority of ED research in the United Kingdom uses the term "Asian" to refer to those with genetic roots in the Indian subcontinent. On the other hand, most ED research in the United States uses the term "Asian" to represent a wide range of East Asian, Southeast Asian, and other Asian ethnic groups (Cummins et al., 2005, p. 559). Therefore, it is critical that future ED research on Asian individuals more specifically define which ethnic groups are being included in the sample demographics, use consistent measures to assess ethnic identity (the two currently established measures for Asian Americans are the Int-Ext Measure and the EAEIS), as well as examine how these different ethnic groups specifically compare with one another across various eating and weight concerns (Ponterotto, 2010, pp.264-265).

Overall, the Asian racial identity is multilayered and complex, and there are numerous sociocultural constructs that have yet to be examined with this group that could provide significant contributions to cross-cultural ED literature. Future studies would do well to consider new constructs that could relate Asian culture to disordered eating (i.e., the cultural meaning of food and meals, culture-specific eating practices), and should also seek to expand Asian women's overall representation in the field of eating concerns and pathology (Cummins et al., 2005, p. 569).

Conclusions

This study set out to assess the cultural applicability of the Mindful Eating Coach (MEC) intervention for Asian women. Asian and Caucasian women were assessed for group differences on their use of the MEC mobile app. The first objective of this study was to compare Asian and Caucasian participants on their baseline differences across variables of eating pathology and self-compassion. Results showed no significant group differences on any of the pre-intervention measures of dietary intent (DIS), preoccupation with eating/weight/shape (PEWS), anorectic cognitions (MAC-R), binge eating (BES), weight discrepancy, and self-compassion (SCS). The second objective of this study was to compare Asian and Caucasian participants on their pre- to post-intervention improvements across four eating pathology variables (DIS, PEWS, MAC-R, BES) and self-compassion. Results showed that the intervention was not differentially effective for Asian and Caucasian participants on any of the intervention outcomes. However, results also demonstrated that the Mindful Eating Coach (MEC) app was an effective intervention for the *combined* sample of Asian and Caucasian users. For the third objective, our results showed that self-compassion was a significant mediator for predicting post-intervention scores of anorectic

cognitions, binge eating, and preoccupation, but not for dietary intent. These findings indicated that increased self-compassion was associated with decreased eating pathology across MAC-R, BES, and PEWS. Future studies may explore how self-compassion specifically relates to dietary intent to inform new suggestions for treatment. The fourth and final objective found that there were no group differences in app acceptability ratings. Overall, this study established the efficacy of the MEC app for *both* Asian and Caucasian participants. The mobile format of the intervention may have contributed to the equal response across the racial identity groups as it did not require significant interpersonal interaction and was likely viewed as a relatively acceptable form of psychoeducation rather than therapy. The sample was a relatively homogenous university sample so the power to detect race-based differences in response to an intervention was limited. More ED research on Asian women using valid and consistent measures, including acculturative measures, is needed. Most importantly, consideration of intragroup differences (i.e., differences between various Asian ethnicities) is needed to improve the field's understanding of the sociocultural elements related to eating behaviors and weight ideals that may drive disordered eating among Asian women.

References

Abe-Kim, J., Takeuchi, D. T., Hong, S., Zane, N., Sue, S., Spencer, M. S., & Alegría, M. (2007). Use of mental health-related services among immigrant and US-born Asian Americans: Results from the National Latino and Asian American study. *America Journal of Public Health*, *97*(1), 91-98. https://doi.org/10.2105/AJPH.2006.098541

Airhihenbuwa, C. O. (2010). Culture Matters in Global Health. *European Health Psychologist*, *12*, 52-55.

Akan, G. E., & Grilo, C. M. (1995). Sociocultural Influences on Eating Attitudes and Behaviors, Body Image, and Psychological Functioning: A Comparison of African-American, Asian-American, and Caucasian College Women. *The International Journal of Eating Disorders*, *18*(2), 181-187. https://doi.org/10.1002/1098-108x(199509)18:2<181::aid-eat2260180211>3.0.co;2-m

Allen, H. N., & Craighead, L. W. (1999). Appetite monitoring in the treatment of Binge Eating Disorder. *Behavior Therapy*, *30*(2), 253-272. https://doi.org/10.1016/S0005-7894(99)80007-0

Barakat, S., Maguire, S., Surgenor, L., Donnelly, B., Miceska, B., Fromholtz, K., Russell, J., Hay, P., & Touyz, S. (2017). The Role of Regular Eating and Self-Monitoring in the Treatment of Bulimia Nervosa: A Pilot Study of an Online Guided Self-Help CBT Program. *Behavioral Sciences*, *7*(3). https://doi.org/10.3390/bs7030039

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, *51*(6), 1173-1182. https://doi.org/10.1037/0022-3514.51.6.1173

Baumel, A., & Kane, J. M. (2018). Examining Predictors of Real-World User Engagement with Self-Guided eHealth Interventions: Analysis of Mobile Apps and Websites Using a Novel Dataset. *Journal of Medical Internet Research*, *20*(12). https://doi.org/10.2196/11491

Bell, A. C., Adair, L. S., & Popkin, B. M. (2002). Ethnic Differences in the Association between Body Mass Index and Hypertension. *American Journal of Epidemiology*, *155*(4), 346-353. https://doi.org/10.1093/aje/155.4.346

Bruening, A. B., & Perez, M. (2019). Compensatory behaviors among racial and ethnic minority undergraduate women. *Eating Disorders*, *27*(2), 123-136. https://doi.org/10.1080/10640266.2019.1585685

Cachelin, F. M., Rebeck, R. M., Chung, G. H., & Pelayo, E. (2002). Does Ethnicity Influence Body-Size Preference? A Comparison of Body Image and Body Size. *Obesity Research*, *10*(3), 158-166. https://doi.org/10.1038/oby.2002.25

Claudat, K., White, E. K., & Warren, C. S. (2016). Acculturative Stress, Self-Esteem, and Eating Pathology in Latina and Asian American Female College Students. *Journal of Clinical Psychology*, *72*(1), 88-100. https://doi.org/10.1002/jclp.22234

Craighead, L. (2006). *The Appetite Awareness Workbook: How to Listen to your Body and Overcome Bingeing, Overeating, and Obsession with Food*. New Harbinger Publications.

Cummins, L. H., Simmons, A. M., & Zane, N. W.S. (2005). Eating Disorders in Asian Populations- A Critique of Current Approaches to the Study of Culture, Ethnicity, and Eating Disorders. *American Journal of Orthopsychiatry*, *75*(4), 553-574. https://doi-org.proxy.library.emory.edu/10.1037/0002-9432.75.4.553

de Carvalho Barreto, M., Ferreira, C., Marta-Simões, J., & Mendes, A. L. (2020). Exploring the paths between self-compassionate attributes and actions, body compassion and disordered eating. *Eating and Weight Disorders*, *25*(2), 291-297. https://doi.org/10.1007/s40519-018-0581-3

de Jong, M., Spinhoven, P., Korrelboom, K., Deen, M., van der Meer, I., Danner, U. N., van der Schuur, S., Schoorl, M., & Hoek, H. W. (2020). Effectiveness of enhanced cognitive behavior therapy for eating disorders: A randomized controlled trial. *International Journal of Eating Disorders*, *53*(5), 717-727. https://doi.org/10.1002/eat.23239

Dicker, S. L., & Craighead, L. W. (2004). Appetite-focused cognitive-behavioral therapy in the treatment of binge eating with purging. *Cognitive and Behavioral Practice*, *11*(2), 213-221. https://doi.org/10.1016/S1077-7229(04)80032-4

Dochat, C., Godfrey, K. M., Golshan, S., Cuneo, J. G., & Afari, N. (2019). Dietary restraint and weight loss in relation to disinhibited eating in obese Veterans following a behavioral weight loss intervention. *Appetite*, *140*, 98-104. https://doi.org/10.1016/j.appet.2019.05.013

Evans, P. C., & McConnell, A. R. (2003). Do racial minorities respond in the same way to mainstream beauty standards? Social comparison processes in Asian, Black, and White women. *Self and Identity*, *2*, 153-167. https://doi.org/10.1080/15298860309030

Fairburn, C. G. (2008). *Cognitive Behavior Therapy and Eating Disorders*. Guilford Press.

Fairburn, C. G., & Wilson, G. T. (2013). The dissemination and implementation of psychological treatments: Problems and solutions. *International Journal of Eating Disorders*, *46*(5), 516-521. https://doi.org/10.1002/eat.22110

Fan, L., & Wang, Y. (2022). Healthy eating behaviors and self-control in scarcity: The protective effects of self-compassion. *Appetite*, *169*. https://doi-org.proxy.library.emory.edu/10.1016/j.appet.2021.105860

Fekete, E. M., Herndier, R. E., & Sander, A. C. (2021). Self-compassion, internalized weight stigma, psychological well-being, and eating behaviors in women. *Mindfulness*, *12*(5), 1262-1271. http://dx.doi.org.proxy.library.emory.edu/10.1007/s12671-021-01597-6

Fresnics, A. A., Wang, S. B., & Borders, A. (2019). The unique associations between self-compassion and eating disorder psychopathology and the mediating role of rumination. *Psychiatry Reesearch*, *274*, 91-97. https://doi.org/10.1016/j.psychres.2019.02.019

Gerstein, L. H., Heppner, P. P., Ægisdóttir, S., Leung, S.-M. A., & Norsworthy, K. L. (Eds.). (2009). *International Handbook of Cross-Cultural Counseling: Cultural Assumptions and Practices Worldwide*. Sage Publications.

Gilbert, P., Bhundia, R., Mitra, R., McEwan, K., Irons, C., & Sanghera, J. (2007). Cultural differences in shame- focused attitudes towards mental health problems in Asian and non-Asian student women. *Mental Health, Religion and Culture*, *10*(2), 127-141. https://doi.org/10.1080/13694670500415124.

Gluck, M. E., & Geliebter, A. (2002). Racial/ethnic differences in body image and eating behaviors. *Eating Behaviors*, *3*(2), 143-151. https://doi.org/10.1016/s1471-0153(01)00052-6

Gong, S., Wang, K., Li, Y., Zhou, Z., & Alamian, A. (2021). Ethnic group differences in obesity in Asian Americans in California, 2013–2014. *BMC Public Health*, *21*(1). https://doi.org/10.1186/s12889-021-11612-z

Gordon, K. H., Holm-Denoma, J. M., Troop-Gordon, W., & Sand, E. (2012). Rumination and body dissatisfaction interact to predict concurrent binge eating. *Body Image*, *9*(3), 352-357. https://doi.org/10.1016/j.bodyim.2012.04.001

Griffiths, S., Rossell, S. L., Mitchison, D., Murray, S. B., & Mond, J. M. (2018). Pathways into treatment for eating disorders: A quantitative examination of treatment barriers and treatment attitudes. *The Journal of Treatment & Prevention*, *26*(6), 556-574. https://doi.org/10.1080/10640266.2018.1518086

Hall, C. I. (1995). Asian Eyes: Body image and eating disorders of Asian and Asian American women. *Eating Disorders*, *3*, 8-19. https://doi.org/10.1080/10640269508249141

Hazzard, V. M., Telke, S. E., Simone, M., Anderson, L. M., Larson, N. I., & Neumark-Sztainer, D. (2020). Intuitive eating longitudinally predicts better psychological health and lower use of disordered eating behaviors: findings from EAT 2010–2018. *Eating and Weight Disorders*, *26*, 287-294. https://doi.org/10.1007/s40519-020-00852-4

Jackson, S. C., Keel, P. K., & Lee, Y. H. (2006). Trans-cultural Comparison of Disordered Eating in Korean Women. *International Journal of Eating Disorders*, *39*(6), 498-502. https://doi.org/10.1002/eat.20270

Jones, E. M. (2012). *Electronic Apps for Food and Appetite Monitoring: Acceptability and Reactive Effects in Women with Eating and Weight Concerns* [Unpublished doctoral dissertation]. Emory University. https://etd.library.emory.edu/concern/etds/pr76f390s?locale=en

Juarascio, A. S., Manasse, S. M., Goldstein, S. P., Forman, E. M., & Butryn, M. L. (2015). Review of Smartphone Applications for the Treatment of Eating Disorders. *European Eating Disorders Review*, *23*(1), 1-11. http://doi.org/10.1002/erv.2327

Katterman, S. N., Kleinman, B. M., Hood, M. M., Nackers, L. M., & Corsica, J. A. (2014). Mindfulness meditation as an intervention for binge eating, emotional eating, and weight loss: A systematic review. *Eating Behaviors*, *15*(2), 197-204. http://doi.org/10.1016/j.eatbeh.2014.01.005

Kawamura, K. Y. (2002). Asian American Body Images. In T. F. Cash & T. Pruzinsky (Eds.), *Body image: A handbook of theory, research, and clinical practice* (pp. 243-249). Guilford Press.

Kazdin, A. E., Fitzsimmons-Craft, E. E., & Wilfley, D. E. (2017). Addressing critical gaps in the treatment of eating disorders. *International Journal of Eating Disorders*, *50*(3), 170-189. https://doi.org/10.1002/eat.22670

Kelly, A. C., Vimalakanthan, K., & Carter, J. C. (2014). Understanding the roles of self-esteem, self-compassion, and fear of self-compassion in eating disorder pathology: An examination of female students and eating disorder patients. *Eating Behaviors*, *15*(3), 388-391. https://doi.org/10.1016/j.eatbeh.2014.04.008

Kim, P. Y., Jin, J., & Bau, K. E. (2021). A Mediator or Moderator? Self-Compassion's Role in the Association Between Emotional Self-Control and Help-Seeking Attitudes Among Asian American College Students. *Asian American Journal of Psychology*. https://doi.org/10.1037/aap0000248

Koff, E., Benavage, A., & Wong, B. (2001). Body-Image Attitudes and Psychosocial Functioning in Euro-American and Asian-American College Women. *Psychological Reports*, *88*(3), 917-928. https://doi.org/10.2466/PR0.88.3.917-928.

Kristeller, J., Wolever, R. Q., & Sheets, V. (2014). Mindfulness-Based Eating Awareness Training (MB-EAT) for Binge Eating: A Randomized Clinical Trial. *Mindfulness*, *5*(3), 282-297. http://doi.org/10.1007/s12671-012-0179-1

Le, T. P., Kuo, L., & Yamasaki, V. (2020). Gendered Racial Microaggressions, Feminism, and Asian American Women's Eating Pathology: An Intersectional Investigation. *Sex Roles*, *83*, 127-142. https://doi.org/10.1007/s11199-019-01100-5

Lee, S., & Katzman, M. A. (2002). Cross-cultural Perspectives on Eating Disorders. In C. G. Fairburn & K. D. Brownell (Eds.), *Eating Disorders and Obesity: A Comprehensive Handbook* (2nd ed., pp. 260-264). Guilford Press.

Lindgreen, P., Lomborg, K., & Clausen, L. (2021). Patient use of a self-monitoring app during eating disorder treatment: Naturalistic longitudinal cohort study. *Brain and Behavior*, *11*(4). https://doi.org/10.1002/brb3.2039

Liou, D., & Bauer, K. D. (2007). Exploratory Investigation of Obesity Risk and Prevention in Chinese Americans. *Journal of Nutrition Education and Behavior*, *39*(3), 134-141. https://doi.org/10.1016/j.jneb.2006.07.007

Marbley, A. F. (2011). *Multicultural Counseling: Perspectives from Counselors as Clients of Color*. Routledge/Taylor & Francis Group.

Martin, L., Espel-Huynh, H. M., Marando-Blanck, S., Evans, B. C., Forman, E. M., Butryn, M. L., Baer, R. A., Wolever, R. Q., & Herbert, J. D. (2017). Trusting homeostatic cues versus accepting hedonic cues: A randomized controlled trial comparing two distinct mindfulness-based intervention components. *Journal of Contextual Behavioral Science*, *6*(4), 409-417. https://doi.org/10.1016/j.jcbs.2017.09.002

Martinez, M. A. (2017). *Mediators and Moderators in a Brief Mobile Intervention For Disordered Eating* [Unpublished doctoral dissertation]. Emory University. https://etd.library.emory.edu/concern/etds/5m60qr88b?locale=es

Marx, L. S. (2016). *A Mindful Eating "App" for Non-Treatment-Seeking University Women with Eating and Weight Concerns* [Unpublished doctoral dissertation]. Emory University. https://etd.library.emory.edu/concern/etds/kd17ct10k?locale=en

Mason, A. E., Jhaveri, K., Cohn, M., & Brewer, J. A. (2018). Testing a mobile mindful eating intervention targeting craving-related eating: feasibility and proof of concept. *Journal of Behavioral Medicine*, *41*(2), 160-173. https://doi.org/10.1007/s10865-017-9884-5

Masuda, A., Goodnight, B. L., Ng, S. Y., Schaefer, L. W., Tully, E. C., Chan, W. Y., & Drake, C. E. (2017). Help-Seeking Stigma in Asian American College Women: the Role of Disordered Eating Cognitions and Psychological Inflexibility. *International Journal for the Advancement of Counselling*, *39*(2), 188-201. https://doi.org/10.1007/s10447-017-9291-1

Mathieu, J. (2009). What should you know about mindful and intuitive eating? *Journal of the American Dietetic Association*, *109*(12), 1982-1987. https://doi.org/10.1016/j.jada.2009.10.023

McCarty, C. A., Weisz, J. R., Wanitromanee, K, Eastman, K. L., Suwanlert, S., Chaiyasit, W., & Band, E. B. (1999). Culture, coping, and context: primary and secondary control among Thai and American youth. *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, *40*(5), 809-818.

Messer, M., Anderson, C., & Linardon, J. (2021). Self-compassion explains substantially more variance in eating disorder psychopathology and associated impairment than mindfulness. *Body Image*, *36*, 27-33. https://doi.org/10.1016/j.bodyim.2020.10.002

Miller, M. N., & Pumariega, A. J. (2001). Culture and Eating Disorders: A Historical and Cross-Cultural Review. *Psychiatry*, *64*(2), 93-100. https://doi.org/10.1521/psyc.64.2.93.18621

Mintz, L. B., & Kashubeck, S. (1999). Body Image and Disordered Eating Among Asian American and Caucasian College Students: An Examination of Race and Gender Differences. *Psychology of Women Quarterly*, *23*(4), 781-796. https://doi.org/10.1111/j.1471-6402.1999.tb00397.x

Neff, K. D. (2003a). Self-compassion: An alternative conceptualization of a healthy attitude toward oneself. *Self and Identity*, *2*, 85–101. http://doi.org/10.1080/15298860390129863

Neff, K. D. (2003b). The development and validation of a scale to measure self-compassion. *Self and Identity*, *2*, 223–250. http://doi.org/10.1080/15298860390209035

Nelson, J. B. (2017). Mindful Eating: The Art of Presence While You Eat. *Diabetes Spectrum : A Publication of the American Diabetes Association*, *30*(3), 171-174. https://doi.org/10.2337/ds17-0015

Orji, R., & Mandryk, R. L. (2014). Developing culturally relevant design guidelines for encouraging healthy eating behavior. *International Journal of Human-Computer Studies*, *72*(2), 207-223. http://dx.doi.org/10.1016/j.ijhcs.2013.08.012

Pisitsungkagarn, K., Taephant, N., & Attasaranya, P. (2014). Body image satisfaction and self-esteem in Thai female adolescents: The moderating role of self-compassion. *International Journal of Adolescent Medicine and Health*, *26*(3), 333-338. https://doi-org.proxy.library.emory.edu/10.1515/ijamh-2013-0307

Polivy, J., & Herman, C. P. (1993). Etiology of binge eating: Psychological mechanisms. In C. G. Fairburn & G. T. Wilson (Eds.), *Binge Eating: Nature, Assessment, and Treatment* (pp. 173-205). Guilford Press.

Ponterotto, J. G., Casas, J. M., Suzuki, L. A., & Alexander, C. M. (Eds.). (2010). *Handbook of Multicultural Counseling* (3rd ed.). Sage Publications.

Querimit, D. S. (2005). *Visible Racial-ethnic Identity and Womanist Identity as Predictors of Body Image and Eating Concerns Among Asian American College Women* [Unpublished doctoral dissertation]. Columbia University.

Regan, P. C., & Cachelin, F. M. (2006). Binge Eating and Purging in a Multi-Ethnic Community Sample. *International Journal of Eating Disorders*, *39*(6), 523-526. https://doi.org/10.1002/eat.20268

Rivera, J., McPherson, A., Hamilton, J., Birken, C., Coons, M., Iyer, S., Agarwal, A., Lalloo, C., & Stinson, J. (2016). Mobile Apps for Weight Management: A Scoping Review. *JMIR Mhealth Uhealth*, *4*(3). https://doi.org/10.2196/mhealth.5115

Robbins, B. (2021). *Evaluation of a Mindful Eating Mobile Intervention* [Unpublished master's thesis]. Emory University. https://etd.library.emory.edu/concern/etds/0k225c276?locale=en

Root, M. P. (1990). Disordered eating in women of color. *Sex Roles*, *22*, 525-536. https://doi.org/10.1007/BF00288168

Rossy, L. (2012). BASICS of Mindful Eating. *Tasting Mindfulness.* Retrieved from http://www.umsystem.edu/newscentral/mindfuleating/basics-of-mindful-eating/

Sala, M., Ram, S. S., Vanzhula, I. A., & Levinson, C. A. (2020). Mindfulness and eating disorder psychopathology: A meta-analysis. *International Journal of Eating Disorders*, *53*(6), 834-851. https://doi.org/10.1002/eat.23247

Sanders, N. M., & Heiss, C. J. (1998). Eating attitudes and body image of asian and caucasian college women. *Eating Disorders*, *6*(1), 15-27. https://doi.org/10.1080/10640269808249244

Santomauro, D. F., Melen, S., Mitchison, D., Vos, T., Whiteford, H., & Ferrari, A. (2021). The Hidden Burden of Eating Disorders: An Extension of Estimates from the Global Burden of Disease Study 2019. *The Lancet Psychiatry*, *8*(4), 320-328. https://doi.org/10.1016/S2215-0366(21)00040-7

Serpell, L., Amey, R., & Kamboj, S. K. (2020). The role of self-compassion and self-criticism in binge eating behaviour. *Appetite*, *144*. http://dx.doi.org.proxy.library.emory.edu/10.1016/j.appet.2019.104470

Sharan, P., & Sundar, A. S. (2015). Eating Disorders in Women. *Indian J Psychiatry*, *57*(2), 286-295. https://doi.org/10.4103/0019-5545.161493

Smart, R., & Tsong, Y. (2014). Weight, Body Dissatisfaction, and Disordered Eating: Asian American Women's Perspectives. *Asian American Journal of Psychology*, *5*(4), 344-352. https://doi.org/10.1037/a0035599

Smith, L. M. (2013). *Sustained Effects of Brief Electronic Self-monitoring as an Early Intervention for Eating Pathology* [Unpublished doctoral dissertation]. Emory University.

Stein, K. F., Corte, C., & Ronis, D. L. (2010). Personal identities and disordered eating behaviors in Mexican American women. *Eating Behaviors*, *11*, 197-200. https://doi.org/10.1016/j.eatbeh.2010.02.001

Stein, R. I., Saelens, B. E., Dounchis, J. Z., Lewczyk, C. M., Swenson, A. K., & Wilfley, D. E. (2001). Treatment of Eating Disorders in Women. *The Counseling Psychologist*, *29*(5), 695-732. https://doi.org/10.1177/0011000001295004

Stice, E. (2001). Risk factors for eating pathology: Recent advances and future directions. In R. H. Striegel-Moore & L. Smolak (Eds.), *Eating Disorders: Innovative Directions in Research and Practice* (pp. 51-73). American Psychological Association. https://doi.org/10.1037/10403-003

Stice, E., Sysko, R., Roberto, C. A., & Allison, S. (2010). Are Dietary Restraint Scales Valid Measures of Dietary Restriction? Additional Objective Behavioral and Biological Data Suggest Not. *Appetite*, *54*(2), 331-339. https://doi.org/10.1016/j.appet.2009.12.009

Tsai, J. L., Ying, Y. W., & Lee, P. A. (2001). Cultural predictors of self-esteem: A study of Chinese American female and male young adults. *Cultural Diversity & Ethnic Minority Psychology*, *7*(3), 284-297. https://doi.org/10.1037/1099-9809.7.3.284

Tylka, T. L., & Sabik, N. J. (2010). Integrating social comparison theory and self-esteem within objectification theory to predict women's disordered eating. *Sex Roles*, *63*(1-2), 18-31. https://doi.org/10.1007/s11199-010-9785-3

Uba, L. (1994). *Asian Americans: Personality Patterns, Identity, and Mental Health*. Guilford Press.

van Hoeken, D., & Hoek, H. W. (2020). Review of the Burden of Eating Disorders: Mortality, Disability, Costs, Quality of Life, and Family Burden. *Current Opinion in Psychiatry*, *33*(6), 521-527. https://doi.org/10.1097/YCO.0000000000000641

Von Ranson, K. M., Wallace, L. M., & Stevenson, A. (2013). Psychotherapies provided for eating disorders by community clinicians: Infrequent use of evidence-based treatment. *Psychotherapy Research*, *23*(3), 333-343. http://doi.org/10.1080/10503307.2012.735377

Waller, G. (2016). Treatment Protocols for Eating Disorders: Clinicians' Attitudes, Concerns, Adherence and Difficulties Delivering Evidence-Based Psychological Interventions. *Current Psychiatry Reports*, *18*(4), 1-8. https://doi.org/10.1007/s11920-016-0679-0

Wang, J., Thornton, J. C., Russell, M., Burastero, S., Heymsfield, S., & Pierson, R. N., Jr. (1994). Asians have lower body mass index (BMI) but higher percent body fat than do whites: comparisons of anthropometric measurements. *The American Journal of Clinical Nutrition*, *60*(1), 23-28. https://doi.org/10.1093/ajcn/60.1.23

Yokoyama, K. (2007). The Double Binds of Our Bodies: Multiculturally-Informed Feminist Therapy Considerations for Body Image and Eating Disorders Among Asian American Women. *Women and Therapy*, *30*(3-4), 177-192. https://doi.org/10.1300/J015v30n03_13

Yu, E. A., & Chang, E. C. (2020). Depressive Symptoms and Life Satisfaction in Asian American College Students: Examining the Roles of Self-Compassion and Personal and Relational Meaning in Life. *Asian American Journal of Psychology*, *11*(4), 259-268. http://dx.doi.org/10.1037/aap0000214

Yu, J., Song, P., Zhang, Y., & Wei, Z. (2020). Effects of Mindfulness-Based Intervention on the Treatment of Problematic Eating Behaviors: A Systematic Review. *The Journal of Alternative and Complementary Medicine*, *26*(8), 666-679. https://doi.org/10.1089/acm.2019.0163

Zones, J. S. (2005). Beauty myths and realities and their Impact on women's health. In M. B. Zinn, P. Hondagneu-Sotelo, & M. A. Messner (Eds.), *Gender through the Prism of Difference* (pp. 65-80). Oxford University Press.

Table 1.

Sample demographics for all participants at Visit 1.

	Mean + SD
Age (n=153)	22.40 ± 3.15 (range: 18.22-30.98)
BMI (n=152)	24.11 ± 4.43 (range: 16.00-45.61)
	n (%)
Race (n=154)	
Asian	43 (27.9%)
White	111 (72.1%)
English as first language (n=154)	
Yes	127 (82.5%)
No	27 (17.5%)
Past ED diagnosis (n=154)	
Yes	6 (3.9%)
No	147 (96.1%)
Past ED treatment (n=154)	
Yes	9 (5.8%)
No	145 (94.2%)
Past mindfulness/meditation experience (n=154)	
Yes	66 (42.9%)
No	88 (57.1%)
Past mindful eating experience (n=154)	
Yes	39 (25.3%)
No	115 (74.7%)
Past experience with self-monitoring eating (n=154)	
Yes	121 (78.6%)
No	33 (21.4%)

Table 2.

Pre-intervention means for treatment completers.

	Means (SD)	
	Asians	Caucasians
DIS	22.49 (5.62) n=39	21.02 (6.13) n=94
PEWS	3.55 (1.39) n=39	3.86 (1.24) n=94
MAC-R	69.15 (11.97) n=39	65.52 (12.95) n=94
BES	15.26 (8.25) n=39	14.91 (7.98) n=94
Weight Discrepancy	15.62 (11.43) n=39	12.24 (10.67) n=94
SCS	2.91 (0.54) n=39	2.97 (0.74) n=94

Note. DIS=Dietary Intent Scale; PEWS=Preoccupation with Eating, Weight, and Shape Scale; MAC-R=Mizes Anorectic Cognitions Questionnaire—Revised; BES=Binge Eating Scale; Weight Discrepancy= discrepancy between ideal versus actual weight; SCS=Self-Compassion Scale

Table 3.

Correlations between variables at baseline for combined sample.

	DIS	SCS	PEWS	MAC-R	BES	Weight Discrepancy
DIS		-.167 n=133	.456** n=133	.503** n=133	.355** n=133	.342** n=128
SCS	-.167 n=133		-.441** n=133	-.468** n=133	-.372** n=133	-.134 n=128
PEWS	.456** n=133	-.441** n=133		.658** n=133	.676** n=133	.356** n=128
MAC-R	.503** n=133	-.468** n=133	.658** n=133		.582** n=133	.350** n=128
BES	.355** n=133	-.372** n=133	.676** n=133	.582** n=133		.418** n=128
Weight Discrepancy	.342** n=128	-.134 n=128	.356** n=128	.350** n=128	.418** n=128	

Note. DIS=Dietary Intent Scale; SCS=Self-Compassion Scale; PEWS=Preoccupation with Eating, Weight, and Shape Scale; MAC-R=Mizes Anorectic Cognitions Questionnaire—Revised; BES=Binge Eating Scale; Weight Discrepancy=discrepancy between ideal versus actual weight

**Correlation is significant at p<.01

Table 4.

Variable means at pre- and post-intervention for the Asian and Caucasian groups.

		Means (SD)	
		Pre-intervention	Post-intervention
DIS			
	Asian	22.49 (5.62) n=39	22.18 (6.55) n=39
	Caucasian	21.02 (6.13) n=94	19.50 (5.47) n=94
MAC-R			
	Asian	69.15 (11.97) n=39	65.47 (12.82) n=39
	Caucasian	65.52 (12.95) n=94	62.06 (12.92) n=93
PEWS			
	Asian	3.55 (1.39) n=39	2.62 (1.03) n=39
	Caucasian	3.86 (1.24) n=94	3.05 (1.19) n=94
BES			
	Asian	15.26 (8.25) n=39	11.03 (7.03) n=39
	Caucasian	14.91 (7.98) n=94	12.20 (8.42) n=92
SCS			
	Asian	2.91 (0.54) n=39	3.20 (0.55) n=39
	Caucasian	2.97 (0.74) n=94	3.19 (0.76) n=93

Note. DIS=Dietary Intent Scale; MAC-R=Mizes Anorectic Cognitions Questionnaire—Revised; PEWS=Preoccupation with Eating, Weight, and Shape Scale; BES=Binge Eating Scale; SCS=Self-Compassion Scale

Table 5.

Asian vs Caucasian group statistics on selected acceptability questions.

	Means (SD)	
	Asian	Caucasian
1) How helpful did you find the app overall?	3.35 (0.88) n=34	3.13 (0.83) n=84
2) The app was a positive way to address my eating and/or weight concerns.	3.88 (0.91) n=32	3.73 (0.94) n=84
3) Using the app reduced the distress and negative emotions (e.g., guilt, regret) I experience related to eating.	3.12 (1.02) n=33	3.00 (0.93) n=84
4) I would recommend this app to other young women with similar problems or concerns.	3.48 (1.03) n=33	3.55 (1.03) n=84
5) While using the app, how helpful would it have been to have also met or talked with a counselor or therapist?	2.33 (1.27) n=33	2.82 (1.35) n=83

Note. Questions 1 & 5 were measured on a scale of 1 (“not at all helpful”) to 5 (“very helpful”);

Questions 2-4 were measured on a scale of 1 (“disagree”) to 5 (“agree”)