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Measurement Invariance of the Eating Disorder Examination Questionnaire (EDE-Q) in a College Sample of Non-Hispanic White and Hispanic Women

Kelsey Serier

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**MEASUREMENT INVARIANCE OF THE EATING
DISORDERS EXAMINATION QUESTIONNAIRE (EDE-Q) IN
A COLLEGE SAMPLE OF NON-HISPANIC WHITE AND
HISPANIC WOMEN**

by

KELSEY N. SERIER

BACHELOR OF SCIENCE

THESIS

Submitted in Partial Fulfillment of the
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Psychology

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**MEASUREMENT INVARIANCE OF THE EATING DISORDER EXAMINATION
QUESTIONNAIRE (EDE-Q) IN A COLLEGE SAMPLE OF NON-HISPANIC WHITE
AND HISPANIC WOMEN**

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ABSTRACT

Objective: Rates of body dissatisfaction and eating disorders have increased in racial and ethnic minority groups, and yet the validity of various commonly-used eating disorder instruments has not been established in these populations. The primary goal of this study was to test the measurement invariance of one such measure, the Eating Disorder Examination Questionnaire (EDE-Q), across a non-clinical sample of non-Hispanic white and Hispanic undergraduate women. Secondary goals of this study were to determine the factor structure of the EDE-Q in this sample, provide information on EDE-Q norms in a non-clinical sample of Hispanic undergraduate women, and examine the effect of acculturation on EDE-Q scores.

Method: As part of a larger body image and eating disorder study, female undergraduates were recruited from a large university in the Southwestern United States. The current study focused on a single measure of eating disorder psychopathology, the EDE-Q, and a measure of ethnic

identification, the Orthogonal Cultural Identification Scale (OCIS). Factor analysis and measurement invariance of the EDE-Q were tested in non-Hispanic white and Hispanic samples.

Results: Confirmatory factor analyses (CFAs) indicated that only one of the six previously reported EDE-Q factor structures, a modified 7-item 3 factor structure of the EDE-Q previously reported by Grilo et al. (2013; 2015), was an acceptable fit of the data in both non-Hispanic white and Hispanic women. Tests of measurement invariance showed that there was configural invariance of the EDE-Q across non-Hispanic white and Hispanic women, indicating that the factor structure was the same across groups. Yet, a test of metric invariance indicated that the factor loadings were not the same across groups. Results from Structural Equation Modeling (SEM) suggested that levels of acculturation to Anglo/White culture was a significant predictor of EDE-Q scores above and beyond ethnic identity, such that greater orientation to Anglo/White culture was associated with higher dietary restraint and lower body dissatisfaction. **Discussion:** A modified 3 factor structure of the EDE-Q was an acceptable fit in both non-clinical samples of non-Hispanic white and Hispanic undergraduate women. However, tests of measurement invariance indicated that the EDE-Q performed differently across non-Hispanic white and Hispanic women. Thus, researchers should be careful when using the EDE-Q to make comparisons across these groups. Additionally, there needs to be further empirical testing of the factor structure of the EDE-Q given that five other previously reported EDE-Q factor structures failed to fit the data from this sample. Level of acculturation may be an important predictor of body dissatisfaction and ED symptomatology in ethnically diverse women and an area for future research.

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**MEASUREMENT INVARIANCE OF THE EATING DISORDER
EXAMINATION QUESTIONNAIRE (EDE-Q) IN A COLLEGE SAMPLE OF NON-
HISPANIC WHITE AND HISPANIC COLLEGE WOMEN**

INTRODUCTION

Eating disorders (EDs) are among the most serious mental health issues affecting young women (Smink, Van Hoeken, & Hoek, 2012). EDs have the highest mortality rate of any psychiatric illness, and the estimated societal costs of EDs are in the millions and growing (Arcelus, Mitchell, Wales & Nielsen, 2011). Although EDs have a low prevalence rate, previous research suggested that ED rates are increasing (Merikangus et al., 2010). Empirically supported treatments for EDs exist, yet only 40-50% of ED patients who undergo treatment will fully recover (Arcelus et al., 2011; Keel & Mitchell, 1997; Steinhausen, 2002). Given the serious consequences, growing prevalence, and the limitations of the efficacious treatments, it is important to continue to study EDs, which includes a careful examination of ED assessment measures.

The sociocultural model of EDs suggests that the wider societal context (e.g., parents, peers, and media) is largely responsible for the manifestation and maintenance of EDs (Thompson, Heinberg, Altabe, & Tantleff-Dunn, 1999). Societal promotion of an ultra-thin ideal for women and the internalization of this ideal have been associated with an increase in body dissatisfaction and ED prevalence (Thompson & Stice, 2001), and have even been proposed to be causal in the development of body dissatisfaction and EDs (Stice, 2002). Given the sociocultural model, it was thought previously that EDs primarily were limited to non-Hispanic white women (Crago, Shisslak, & Estes, 1996; Pate, Pumariega, Hester, & Garner, 1992). Yet

more recent research has challenged the “golden girl” myth and demonstrated that ED prevalence is comparable across racial and ethnic groups (Franko, 2007; Smolak & Striegel-Moore, 2001). In some instances, racial and ethnic minorities (particularly African Americans, Hispanics, and Native Americans) have shown higher rates of EDs than their Caucasian counterparts (Croll, Neumark-Sztainer, Story, & Ireland, 2002; Franko, 20007; Hudson, Hiripi, Pope, & Kessler, 2007). Thus, the sociocultural model would interpret the high rates of EDs in racial and ethnic minorities as suggesting that the thin ideals of the wider society are being projected to and internalized by a diversity of women.

Some studies tested the presence and internalization of the thin ideal in diverse samples and found support for the sociocultural model of EDs. Internalization of the thin ideal predicted body dissatisfaction and ED behaviors in female adolescents from Guatemala, and mediated the relationship between awareness of a thin ideal and body dissatisfaction in a sample of Mexican girls (Austin & Smith, 2008; Vander Wal, Gibbons & Grazioso, 2008). However, other studies found that race and ethnicity actually served as a protective factor against thin ideal internalization in Hispanic American women (Croll et al., 2002; Neumark-Sztainer et al., 2007; Warren, Gleaves, Cepeda-Benito, Fernandez & Rodriguez-Ruiz, 2005). Overall, thin ideal internalization may influence rates of EDs and body dissatisfaction in diverse women, but cultural factors can also affect this relationship. Thus, the relationship between race, ethnicity, and the sociocultural model of EDs is complicated and requires additional research.

The sociocultural model of EDs further suggests that as individuals become more acculturated to societies that value and promote the thin-ideal, body dissatisfaction and EDs will increase. And some studies have concluded that acculturation is a risk factor in body

dissatisfaction and EDs among racial and ethnic minorities, especially Hispanic women. For example, Chamorro and Flores-Ortiz (2000) found that 2nd generation Mexican American women were more acculturated and had greater rates of disordered eating compared to Mexican American women with other generational statuses. Additionally, U.S.-born Latinas and Latinas that had spent a greater percentage of their lifetime living in the U. S. had a significantly higher risk of developing EDs than recent immigrants (Alegría et al., 2007). The risk of EDs also was higher in Mexican Americans that reported higher orientation to Anglo American culture (Cachelin, Phinney, Schug, & Striegel-Moore, 2006). Acculturative stress also predicted drive for thinness and moderated the relationship between body dissatisfaction and bulimic symptoms among Hispanic women (Gordon, Castro, Sitnikov, & Holm-Denoma, 2010; Perez, Voelz, Pettit & Joiner, 2002). However, other studies found no significant effect of acculturation on prevalence rates of ED symptomology and body dissatisfaction in Hispanic American women (Gowen, Hayward, Killen, Robinson, & Taylor, 1999; Joiner & Kashubeck, 1996). Overall, the process of acculturation may influence rates of EDs and body dissatisfaction in women, but discrepant findings give cause to a need for continued research.

The Eating Disorder Examination Questionnaire (EDE-Q)

The EDE-Q is a widely used self-report measure of eating pathology that is largely considered “the gold standard” (Guest, 2000). This questionnaire is derived from the Eating Disorder Examination (EDE) semi-structured interview (Fairburn & Beglin, 1994). Both the EDE and EDE-Q are designed to assess the cognitive and/or attitudinal features of eating disorders, as well as specific behavioral symptoms (Fairburn, 2008). The EDE-Q is composed of four subscales: restraint, eating concern, weight concern, and shape concern. These four

subscales are averaged together to produce a global or total score (Cooper, Cooper, & Fairburn, 1989).

The reliability and validity (i.e., discriminant, criterion, and convergent) of this measure are widely tested and supported. Specifically, the EDE-Q, including subscales, shows good internal consistency and test-retest reliability (Mond, Hay, Rodgers, Owen, & Beumont, 2004; Peterson et al., 2007). The EDE-Q discriminates well between individuals with and without an ED diagnosis, with individuals with an ED scoring significantly higher than non-clinical individuals (Mond et al., 2004; Aardoom, Dingemans, Slof Op't Landt, & Van Furth, 2012). Additionally, individuals classified as having an ED according to cut-offs on the EDE-Q score significantly higher on other measures of ED psychopathology (Engelsen & Laberg, 2001). There are norms for this measure in many different populations, including in clinical, community, undergraduate, Caucasian, and African American women samples (Binford, Le Grange, & Jellar, 2005; Kelly, Cotter, & Mazzeo, 2012; Luce & Crowther, 2008; Mond et al., 2006). However, there are no established norms for the EDE-Q in non-clinical Hispanic women. Established norms are important for screening and diagnostic purposes in this subset of women who are at equal or higher risk for EDs compared to non-Hispanic white women (Hudson et al., 2007).

Factor Structure of the Eating Disorder Examination Questionnaire (EDE-Q)

Measurement properties of the EDE-Q, including its factor structure, were largely based on the EDE (Fairburn & Beglin, 1994). The EDE's conceptually-based original subscales showed good internal consistency and were discriminant between clinical and control groups when tested. These five factors included restraint, bulimia, eating concern, shape concern, and

weight concern (Cooper et al., 1989). However, with subsequent revisions of the EDE a distinction between the cognitive and behavioral features of eating psychopathology was made. Specifically, the bulimia subscale (which represents pathological eating behaviors) was considered separately from the other scales (which represent the underlying attitudinal and cognitive features of eating pathology). These latter four subscales were then averaged to generate a global score of pathological eating cognitions and attitudes (Fairburn & Cooper, 1993). Given that the EDE-Q was derived from the EDE, the authors proposed the same four conceptually-supported factors in the EDE-Q (Fairburn & Beglin, 1994). However, despite the conceptual and preliminary statistical support for the four factors, empirical research has been unable to replicate the factor structure of this measure in a variety of different samples, including obese bariatric surgery candidates, ED patients, female community members, and asymptomatic university and adolescent students (See Table 1).

Hrabosky et al. (2008) used confirmatory factor analysis (CFA) with obese bariatric surgery candidates and concluded that the original four factor structure was not a good fit. Instead, CFA found support for a 12-item measure with the following four factors: eating disturbance, appearance concern, dietary restraint, and shape/weight overvaluation. In another study examining the factor structure of the EDE-Q in bariatric surgery candidates, CFA supported a 7-item 3 factor model (Grilo, Henderson, Bell, & Crosby, 2013). The three factors were interpreted as: dietary restraint, weight and shape overvaluation, and body dissatisfaction. Overall, these findings raise more questions about the factor structure and validity of the EDE-Q, given that the factor structure was inconsistent across similar samples.

Peterson et al. (2007) found support for a 22-item, 3 factor measure in individuals with bulimic symptomatology using exploratory factor analysis (EFA). Two of the factors closely resembled the original restraint and eating concern subscales. The third factor largely included the items in the weight and shape concern subscales. Although two items did not load onto any factor and can hypothetically be interpreted as the presence of a fourth factor (albeit not identical to the original four factor structure), the authors concluded that the data supported a three factor structure of the EDE-Q. Another study with a clinical sample tested five previously reported EDE-Q models using CFA (Allen, Byrne, Lampard, Watson, & Fursland, 2011). Although none of the models provided a good fit of the data, a brief one factor model that included eight items from the original weight and shape concern subscales was acceptable in both samples.

When testing the EDE-Q in a university sample, Grilo, Reas, Hopwood, and Crosby (2015) found support for the 7-item 3 factor structure that they found previously in their study of bariatric surgery candidates (Grilo et al. 2013). The EDE-Q factor structure also was examined in both male and female college student athletes *and* male and female college students not engaged in competitive sports (Darcy, Hardy, Lock, Hill, & Peebles, 2013). CFA revealed that the original four structure model was not a good fit for all groups, so the authors used EFA. Since analyses suggested different items and factor structures for each of the four groups of students, it was decided that gender and activity status could be important considerations when interpreting EDE-Q responses. The original four factor model of the EDE-Q was also a poor fit with non-clinical adolescent girls and boys (White, Haycraft, Goodwin, & Meyer, 2014). EFA identified three factors: shape and weight concern, restraint, and preoccupation and eating concern.

Although the original factor structure was not supported, the authors hypothesized that the original factors were present, but the weight and shape concern subscales had been collapsed.

In summary, no study of the factor structure of the EDE-Q has replicated the original factor structure suggested by Fairburn and Beglin (1994). In fact, different studies showed evidence for three, two, and one factor models using all items. Other studies deleted measure items and found support for a brief one factor model and a modified three factor model. In addition, the factor structure varied across different samples. Based on previous research, it appeared important to continue to evaluate the psychometric properties of the EDE-Q in order to clarify the discrepancies in factor structure and improve measurement validity. Additionally, the factor structure of the EDE-Q had not been examined in diverse populations, despite its use to evaluate eating psychopathology in diverse samples. Previous research found that Latinas scored significantly higher on the EDE-Q restraint, shape concern, weight concern, and global scores than a non-Hispanic white comparison group (Franko et al., 2012). These elevated scores in Latinas highlighted the need to assess for measurement validity of the EDE-Q in this population.

Measurement Invariance and the Eating Disorder Examination Questionnaire (EDE-Q)

Before attempting to compare two groups' scores on a given questionnaire, one should first determine whether the instrument is measuring the same constructs across groups. If the questionnaire is shown to have measurement equivalence or invariance, one can assume it is measuring the same construct across groups. In the absence of measurement invariance/equivalence, group differences on a measure are not interpretable.

Tests of measurement invariance on ED measures in non-Hispanic white and Hispanic women have produced mixed findings. Warren et al. (2008) tested the Body Shape Questionnaire

(BSQ) in Euro-American, Hispanic American, non-clinical Spanish, and clinical Spanish women. They found that the BSQ was invariant across sample and language status. Thus, there is evidence that the BSQ measures the same underlying constructs across ethnicity, language, and eating disorder status. Belon et al. (2011) found that the Eating Attitudes Test (EAT) was invariant across a sample of non-clinical Caucasian and Hispanic women. A similar study by Belon et al. (2015) tested the measurement invariance of three clinical subscales (Drive for Thinness, Bulimia, and Body Dissatisfaction) of the Eating Disorders Inventory (EDI-II) across non-clinical Caucasian and Hispanic women. Only the Drive for Thinness scale was invariant across ethnic status; thus the Bulimia and Body Dissatisfaction subscales were measuring different constructs in the two groups. Regarding the EDE-Q, Peñelo et al. (2013) found that the EDE-Q was invariant across Mexican adolescents living in rural or urban environments, but they did not examine invariance across ethnicity.

In summary, the importance of tests of measurement invariance across Hispanic and non-Hispanic white women is underscored by the fact that eating disorders in Hispanic women are increasing, and well-validated assessment tools are needed (Hudson et al., 2007). Furthermore, given the mixed findings of previous tests of measurement invariance on widely used ED and body image measures, it is important to investigate the measurement invariance of the EDE-Q across ethnic and racial groups.

Current Study

The current study examined the factor structure and tested the measurement invariance of the EDE-Q across a non-clinical sample of non-Hispanic white and Hispanic college women.

The plan was to determine whether measurement invariance could be established, and in the

event that it was, the EDE-Q norms would be reported for a non-clinical sample of Hispanic undergraduate women. Given previous research, it was hypothesized that the original factor structure would not be upheld. However, it was hypothesized that one of the EDE-Q factor models: four (Fairburn & Beglin, 1994), three (Peterson et al., 2007), two (Becker et al., 2009), one (Pennings & Wojciechowski, 2004), brief one factor (Allen et al., 2011; Byrne et al., 2010), or the modified three factor model (Grilo et al., 2013; Grilo et al., 2015) would fit the data. In addition, it was hypothesized that the EDE-Q would be invariant across Hispanic and non-Hispanic white college women, given the findings by Grilo et al. (2015) and Penelo et al. (2013) in their tests of invariance across weight status, gender, and location. Furthermore, Belon et al. (2011) found the EAT invariant across Hispanic and Caucasian college women. Finally, the effect of acculturation on the relationship between ethnicity and EDE-Q scores would be examined. It was hypothesized that acculturation would not have a significant effect on the relationship between ethnicity and subscale/global scores on the EDE-Q or factor structure of the EDE-Q, because the sample was likely to be highly acculturated.

METHODS

Participants

Data for the current study were collected as part of a larger, on-going study on body image and eating disorder psychopathology in undergraduate women at the University of New Mexico. Study participants included 716 undergraduate women recruited via a web-based experiment management system associated with the General Psychology classes. Inclusionary criteria were: (1) female, (2) age 18 – 40 years, (3) proficiency in English. Because this study was interested in ethnic identity, participants that did not indicate an ethnicity were excluded ($n =$

12) from the study. Additionally, participants that reported a race other than White ($n = 103$; i.e. African American) or multiple races ($n = 46$; i.e. Hispanic and Black) were excluded from the study. We were primarily interested in comparing individuals that identified as Caucasian and Hispanic in this study given that most previous research has examined the validity of ED measures in largely White samples and few studies have examined the validity of ED measures in Latina populations. The final sample included 555 participants. All participants received course credit or extra credit for their participation in the study. This study was approved by the University of New Mexico Institutional Review Board (See Appendices A and B).

Measures

Demographic Questionnaire. A demographics form designed by the researchers asked the participants to report age, ethnic identity, marital status, education, height, and weight (See Appendix C). With the introduction of new census recommendations for reporting ethnicity and race (Sondik, Lucas, Madanas, & Smith, 2000), a revised demographics form was created to take these changes into account. However, participants were still asked to write in their ethnic identity. These write-ins, which were similar to the write-ins in the original demographic form, were used as the self-report measure of ethnic identity (See Appendix D).

Eating Disorder Examination Questionnaire (EDE-Q; Fairburn & Beglin, 1994). The EDE-Q is a self-report measure of eating disorder behaviors and attitudinal and cognitive features of eating disorder psychopathology (See Appendix E). It was developed from the Eating Disorders Examination, a semi-structured interview of eating disorder psychopathology and behaviors that is often considered the “gold standard” in eating disorder assessment (Cooper et al., 1989; Guest, 2000). The measure has four subscales: dietary restraint, eating concern, weight

concern, and shape concern. The EDE-Q has good internal consistency, test-retest reliability, criterion validity, and discriminant validity (Berg, Peterson, Frazier, & Crow, 2012). The internal consistency for the EDE-Q and its subscales in this sample was $\alpha = 0.95$ (global), $\alpha = 0.79$ (restraint), $\alpha = 0.77$ (eating concern), $\alpha = 0.92$ (shape concern), and $\alpha = 0.87$ (weight concern).

In the first part of the measure, participants are asked to indicate on a 7-point Likert scale (0 = no days, 1 = 1-5 days, ..., 6 = every day) how many days over the past 28 they have engaged in certain behaviors or had certain *thoughts* regarding body shape, weight, and eating. For example, participants are asked, "Have you had a definite desire to have a totally flat stomach?" In the second part of the measure, participants are asked to write in the number of times over the past 28 days that they have engaged in certain *behaviors*, such as, "Over the past 28 days, how many times have you made yourself sick (vomit) as a means of controlling your shape or weight?" The next part of the survey assesses the frequency of certain eating behaviors. Participants are asked to indicate on a 7-point Likert scale (0 = no days, 1 = 1-5 days, ..., 6 = every day) the number of days they have engaged in certain eating behaviors, such as, "Over the past 28 days, on how many days have you eaten in secret?" Lastly, the measure asks participants to answer questions about weight and shape on a 7-point Likert scale (0 = not at all, 6 = markedly). A sample item is, "Has your weight influenced how you think about (judge) yourself as a person?" Participants also are asked to indicate their current weight and height, the number of menstrual periods missed in the past 3-4 months, and whether or not the participant is taking birth control.

The Orthogonal Cultural Identification Scale (OCIS: Oetting & Beauvais, 1991). This measure asks participants to report their level of identification with different cultures (See

Appendix F). Participants respond to six different questions that ask to what degree they have certain traditions, live by, or are considered successful in five different cultural traditions: 1) White-American or Anglo culture, 2) Mexican-American or Spanish culture, 3) American-Indian culture, 4) Black-American culture, and 5) Other culture, in which participants can indicate a specific culture in a blank space. For example, one item asks, “In your own family, do you do special things together or have special traditions that are based on....” For each of the six items, participants are asked to respond on a 4-point Likert scale where 1 = None/not at all and 4 = a lot for each of the cultures listed. A cultural identification score for each culture is calculated by averaging the responses on each of the six items for each culture. Scores higher than three indicate high identification, whereas scores of one or less indicate low cultural identification (Oetting & Beauvais, 1991).

The OCIS was validated across many different race and ethnicities, including American Indian/Alaskan Natives and Hispanics (Venner, Wall, Lau, & Ehlers, 2006; Oetting, Swaim, & Chiarella, 1998). The measure showed good reliability and construct validity. In this sample, the OCIS for the White-American or Anglo and the Mexican American or Spanish culture subscales, respectively, were $\alpha = 0.93$ and $\alpha = 0.97$.

Procedure

Participants from undergraduate psychology classes signed up for the study via a web-based project management system. They received course credit or extra credit for their participation. A group of approximately six participants met at the laboratory at the designated time. A research assistant explained the study, including potential risks and benefits from participating. Participants had the opportunity to ask questions and were informed that they could

discontinue their involvement at any point without penalty. After all questions were answered, participants gave informed consent as approved by the University of New Mexico IRB, or chose to discontinue their participation in the study. After consenting, participants were instructed to fill out a battery of questionnaires. Research assistants were available to answer questions. After completing the questionnaires, participants were debriefed.

All participants responded to the question wrote in a description of their racial/ethnic identity on the demographics form. Two independent raters coded these statements as either indicating non-Hispanic white or Hispanic origin. Any discrepancies were resolved by consensus. Participants indicating a different racial/ethnic identity other than non-Hispanic white or Hispanic were removed from the analyses ($n = 103$). Individuals that identified as multiple races (with the exclusion of those who identified as non-Hispanic white and Hispanic) were removed from the study ($n = 46$). Some statements could not be coded as belonging to a particular ethnic origin (i.e., Human, Mixed). These participants were removed from the analysis ($n = 12$). The final sample included 555 participants.

Data Analytic Strategy

Although the recommendations for sample size in CFAs are varied, a critical sample size of 200 participants in each group is required. Therefore, the current sample size met the critical sample size recommendations (Hair, Black, Babin, Anderson & Tatham, 2006).

All analyses were performed with SPSS version 23 or Mplus version 7.31 (Muthén & Muthén, 2010) using maximum likelihood robust estimator because the data were highly non-normal (Yuan & Bentler, 2000). Model fit was examined using the Comparative Fit Index (CFI;

0.95), Tucker Lewis Index (TLI; 0.95), Root Mean Square Error of Approximation (RMSEA; 0.06), and Standardized Root Mean Square Residual (SRMR; 0.08; Hu & Bentler, 1999).

Successively restrictive models were fitted to the data to test for measurement invariance (see Chen, Sousa, & West, 2005). The first model, the configural model, indicated whether or not the factor structure of the EDE-Q was equivalent across non-Hispanic and Hispanic participants. The second model, the weak invariance model, tested and indicated whether or not the factor loadings of the EDE-Q items were equivalent in both groups. The third model, the strong invariance model, specified whether or not the factor loadings and the intercepts were invariant across groups. The fourth model, the strict factorial invariance model, held variances constant across groups. Corrected χ^2 tests were used to compare fits between models.

RESULTS

Demographics

Participants ($N = 555$) had a mean age of 20.06 years ($SD = 3.39$) and a mean BMI of 23.69 ($SD = 4.66$). Most participants had never been married ($n = 512$; 92.3%), with the remainder of participants having been married and living with a husband ($n = 31$; 5.6%), divorced ($n = 7$; 1.3%), married but not living with a husband ($n = 3$; 0.5%), or separated ($n = 1$; 0.2%). One participant did not provide marital status. Most participants had completed high school ($n = 275$; 49.5%), with the remainder having completed 1 year of college ($n = 113$; 20.4%), 3 years of college ($n = 74$; 13.3%), an associate's degree ($n = 71$; 12.8%), a bachelor's degree ($n = 13$; 2.3%), other ($n = 5$; 0.9%), 11th grade ($n = 2$; 0.4%), some graduate school ($n = 1$; 0.2%), or a master's degree ($n = 1$; 0.2%). Approximately 60.2% of participants ($n = 334$) identified as being of Hispanic, Latino, or Spanish origin and 39.8% of participants ($n = 221$)

identified as being of non-Hispanic white origin. Demographic information is presented in Table 2.

Ethnic Group Differences in Demographic Variables

To test for potential ethnic group differences on key demographic variables, independent-samples t-tests were conducted to compare age and BMI in Hispanic and Non-Hispanic undergraduate women. Levene's test for equality of variance was found to be violated for the analysis of age ($F = 26.97, p < .001$). Due to this violation, an independent samples t statistic not assuming homogeneity of variance was computed for age. Participants identifying as of Hispanic origin were significantly younger ($M = 19.69, SD = 2.80$) than participants identifying as of non-Hispanic white origin ($M = 20.62, SD = 4.06$); $t(357.051) = 2.98, p = .003$. Additionally, Hispanic participants had significantly higher BMIs ($M = 24.18, SD = 4.92$) than non-Hispanic white participants ($M = 22.96, SD = 4.15$); $t(695.98) = -3.05, p = .002$.

Item Variability and Skew

The means, standard deviations, skewness, and kurtosis were examined for all EDE-Q items included in the CFAs (See Table 3). Several items were particularly noteworthy. Item 2, "Have you gone for long periods of time (8 waking hours or more) without eating anything to influence your shape or weight?" was rarely endorsed ($M = .51$), with a skewness of 2.85 and kurtosis of 8.75. Similarly, Item 19, "Over the past 28 days, on how many days have you eaten in secret (i.e. furtively)?" was rarely endorsed ($M = .28$) with a skewness of 3.78 and a kurtosis of 17.48. These analyses of skewness and kurtosis indicate that the EDE-Q items in this sample were highly non-normal. Thus, a maximum likelihood estimator was used in tests of the factor structure and measurement invariance to account for this violation of the assumption of

normality (Flora & Curran, 2004). Inter-item correlations ranged from 0.10 to 0.75. (See Table 4). Some of these inter-correlations were quite low, but are to be expected given that these items tap different underlying constructs. Additionally, some factor structures of the EDE-Q have eliminated some items due to problematic statistical properties.

Confirmatory Factor Analyses

Four Factor Model

The original four factor model structure of the EDE-Q proposed by Fairburn and Beglin (1994) failed to converge in both non-Hispanic white and Hispanic groups. This model was not explored further.

Three Factor Model

A 22-item three factor model for the EDE-Q was tested with CFA in order to examine the fit of the overall model. The model fit was poor in both the non-Hispanic white [$\chi^2(206) = 699.84, p < .001$; CFI = 0.82; TLI = 0.80; RMSEA = 0.10 (90% CI = 0.09-0.11); SRMR = 0.07] and Hispanic groups [$\chi^2(206) = 1035.17, p < .001$; CFI = 0.80; TLI = 0.78; RMSEA = 0.11 (90% CI = 0.10-0.12) SRMR = 0.08]. The CFA models are provided in Figure 1 (non-Hispanic white) and Figure 2 (Hispanic). The unstandardized regression coefficients and standard errors are provided in Table 5 (non-Hispanic white) and Table 6 (Hispanic).

Two Factor Model

A test of a 22-item two-factor EDE-Q model suggested that this model was a poor fit of the data in both non-Hispanic white [$\chi^2(208) = 721.38, p < .001$; CFI = 0.82; TLI = 0.80; RMSEA = 0.11 (90% CI = 0.10-0.11); SRMR = 0.07] and Hispanic undergraduate women [$\chi^2(208) = 1137.99, p < .001$; CFI = 0.78; TLI = 0.75; RMSEA = 0.11 (90% CI = 0.10-0.11); SRMR

= 0.08]. The CFA models are provided in Figure 3 (non-Hispanic white) and Figure 4 (Hispanic). The unstandardized regression coefficients and standard errors are provided in Table 7 (non-Hispanic white) and Table 8 (Hispanic).

One Factor Model

The test of fit for a 22-item one factor model suggested that the overall model was a poor fit of the data in both non-Hispanic white [$\chi^2(209) = 787.02, p < .001$; CFI = 0.79; TLI = 0.77; RMSEA = 0.11 (90% CI = 0.10-0.12); SRMR = 0.07] and Hispanic groups [$\chi^2(209) = 1263.32, p < .001$; CFI = 0.75; TLI = 0.72; RMSEA = 0.12 (90% CI = 0.11-0.13); SRMR = 0.08]. The CFA models are provided in Figure 5 (non-Hispanic white) and Figure 6 (Hispanic). The unstandardized regression coefficients and standard errors are provided in Table 9 (non-Hispanic white) and Table 10 (Hispanic).

Brief One Factor Model

An 8-item one factor model for the EDE-Q was a poor fit for non-Hispanic white [$\chi^2(20) = 111.78, p < .001$; CFI = 0.91; TLI = 0.87; RMSEA = 0.14 (90% CI = 0.12-0.17); SRMR = 0.04] and Hispanic groups [$\chi^2(20) = 153.56, p < .001$; CFI = 0.91; TLI = 0.87; RMSEA = 0.14 (90% CI = 0.12-0.16); SRMR = 0.04]. The CFA models are provided in Figure 7 (non-Hispanic white) and Figure 8 (Hispanic). The unstandardized regression coefficients and standard errors are provided in Table 11 (non-Hispanic white) and Table 12 (Hispanic).

Brief Three Factor Model

A 7-item, 3 factor model, found by Grilo et al. (2015) in their undergraduate sample, was an acceptable fit of the data for both non-Hispanic white [$\chi^2(11) = 22.75, p < .001$; CFI = 0.98; TLI = 0.97; RMSEA = 0.07 (90% CI = 0.03-0.11); SRMR = 0.020] and Hispanic college women

[$\chi^2(11) = 44.98, p < .001$; CFI = 0.97, TLI = 0.94; RMSEA = 0.10 (90% CI = 0.07-0.13); SRMR = 0.04]. In these models, the significant χ^2 test is likely driven by the large sample size. Bentler and Bonnet (1980) reported that the χ^2 will typically reject the model when large sample sizes are used. The RMSEA fit statistic is slightly outside the recommended ranges to indicate a good fitting model (recommended range is RMSEA < 0.06). This reflects a lack of parsimony in the model (Hooper, Coughlin, & Mullen, 2008). However, it is important to note that the RMSEA fit index can be positively biased based on few degrees of freedom in the analysis (Kline, 2011). The CFA models are provided in Figure 9 (non-Hispanic white) and Figure 10 (Hispanic). The unstandardized regression coefficients and standard errors are provided in Table 13 (non-Hispanic white) and Table 14 (Hispanic).

Summary of Confirmatory Factor Analyses

The 7 item, 3 factor model was an acceptable fit of the data in both non-clinical samples of non-Hispanic white and Hispanic undergraduate women. The other tested models (e.g., four, two) poorly fit the data. Based on these findings, the 7 item 3 factor model was used in tests of measurement invariance between groups.

Measurement Invariance

A test of configural invariance indicated that the model fit the data reasonably well in both groups [$\chi^2(22) = 78.66, p < .001$; CFI = 0.98, TLI = 0.96; RMSEA = 0.10 (90% CI = 0.07-0.11); SRMR = 0.04]. This indicated that the factor structure of the EDE-Q was the same in non-Hispanic white and Hispanic groups. The χ^2 difference test was employed to compare the fit of the weak invariance (metric) and the configural invariance models. This difference test was significant, $\chi^2(4) = 17.27, p < .001$, indicating that the weak invariance was a significantly

worse fit than the configural invariance model. This suggested that the item factor loadings were not invariant across non-Hispanic and Hispanic undergraduate women. Overall, the tests of invariance indicate that the EDE-Q is not equivalent across groups. The results of tests of configural, metric, and scalar invariance are reported in Table 15.

Comparison of Confirmatory Factor Analysis Models in Hispanic Undergraduate Women

Given the lack of measurement invariance across samples of non-Hispanic and Hispanic undergraduate women, the model fit for Hispanic women was explored further. The 7 item, 3 factor structure displayed elevated RMSEA and high standardized residual values. Further analyses with correlated residuals based on modification indices and relevant theory (i.e., non-Hispanic and Hispanic women differ in dieting and body dissatisfaction prevalence; Chamorro & Flores-Ortiz, 2000; Crago & Shisslak, 2003; Marques et al, 2011) were carried out. Correlations were then eliminated progressively and a chi-square difference test was conducted to compare the respective models.

The model chosen was one that fit the data significantly well and was the most parsimonious. This 7-item, 3 factor model had correlated residuals between item 23 (importance of shape) and item 26 (dissatisfaction with shape). The model was an excellent fit of the data for our sample of non-clinical Hispanic undergraduate women [$\chi^2(10) = 23.12, p = 0.010$; CFI = 0.987; TLI = 0.972; RMSEA = 0.063 (90% CI = 0.029-0.097); SRMR = 0.04]. The CFA model with correlated residuals for Hispanic women is provided in Figure 11. The unstandardized regression coefficients and standard errors are provided in Table 16

Structural Equation Model with Acculturation and Ethnicity as Exogenous Predictors

In order to further explore possible explanations for the lack of measurement invariance across non-Hispanic and Hispanic women, acculturation and ethnicity were examined as exogenous predictors of EDE-Q factor structure and scores. Previous literature has suggested that level of acculturation may be associated with increased body dissatisfaction and ED symptomatology (Alegria et al., 2007; Cachelin et al., 2006). Thus, level of acculturation to Anglo/White culture was examined as an exogenous predictor of the measurement model to see if it was significantly associated with EDE-Q scores.

SEM indicated that the 7 item 3 factor model by Grilo et al. (2013; 2015) with ethnicity and level of acculturation to Anglo/White culture as exogenous predictors and BMI as a covariate was a good fit of the data in this non-clinical sample of undergraduate women [$\chi^2(25) = 104.38, p < 0.001$; CFI = 0.97; TLI = 0.94; RMSEA = 0.08 (90% CI = 0.08-0.09) SRMR = 0.03]. Level of Anglo/White acculturation was associated significantly with higher dietary restraint, shape/weight overvaluation, and body dissatisfaction. Ethnic identity significantly predicted the latent constructs. Non-Hispanic white identity was associated with increased dietary restraint and shape/weight overvaluation. Hispanic identity was associated with higher body dissatisfaction even when BMI was accounted for. The SEM is provided in Figure 12. The unstandardized regression coefficients and standard errors are provided in Tables 17 and 18.

EDE-Q Norms for Hispanic and Non-Hispanic White Undergraduate Women

Although the lack of measurement invariance calls into question the construct validity of the EDE-Q in Hispanic, undergraduate women, it is still important to establish normative data for this measure in this population because of its wide use. No normative data for the EDE-Q has been previously published for Hispanic undergraduate women. Averages, standard deviations,

and percentile ranks are reported for the EDE-Q global and subscale (restraint, eating concern, shape concern, and weight concern) scores in both Hispanic and non-Hispanic white undergraduate women (See Tables 19 and 20). Independent *t*-tests indicated that there were no significant differences in restraint ($t = 1.42, p = 0.16$), eating concern ($t = 0.40, p = 0.67$), shape concern ($t = -0.76, p = 0.45$), weight concern ($t = -0.15, p = 0.88$), and global scores ($t = 0.16, p = 0.88$) between Hispanic and non-Hispanic white undergraduate women.

Previous research in undergraduate populations has suggested that a score of 4 or greater on any subscale or global scale indicates clinical significance (Luce et al., 2008; Mond et al., 2006). In this sample, 5.6% of the undergraduate women (5.9% non-Hispanic white, 5.4% Hispanic) had clinically significant scores on the restraint subscale, 1.4% of the women (1.2% non-Hispanic white, 1.5% Hispanic) had clinically significant scores on the eating concern subscale, 25.0% of the women (24.0% non-Hispanic white, 25.7% Hispanic) had clinically significant scores on the shape concern subscale, 19.1% of the women (16.7% non-Hispanic white, 18.6% Hispanic) had clinically significant scores on the weight concern subscale, and 5.6% of the women (5.4% non-Hispanic white, 5.7% Hispanic) had clinically significant scores on the global scale.

The EDE-Q also includes items that assess the frequency of a variety of eating disordered behaviors (i.e., binge eating, self-induced vomiting, laxative misuse, and excessive exercise). Percentages reporting any occurrence and regular occurrence are reported in Tables 21 and 22 for both Hispanic and non-Hispanic undergraduate women. Independent *t*-tests showed no significant differences in the frequency of self-induced vomiting ($t = -0.37, p = 0.71$), laxative misuse ($t = 0.03, p = 0.98$), and excessive exercise ($t = 0.47, p = 0.64$) between Hispanic and

non-Hispanic white undergraduate women. However, Hispanic women were more likely to report episodes of binge eating ($M = 2.19, SD = 7.22$) than non-Hispanic white women ($M = 1.20, SD = 274$); $t(460.90) = -2.27, p = 0.02$. Although Fairburn and Beglin (1994) caution that the EDE-Q may result in an over-reporting of the key behavioral features of EDs, the data does suggest that Hispanic undergraduate women are more likely to self-report instances of binge eating compared to non-Hispanic white undergraduate women.

Ethnic Identification

Again, given the factor analysis and measurement invariance findings, caution must be used when interpreting EDE-Q findings in Hispanic women. However, it is still important to characterize the possible contributing factor of acculturation to ED symptomatology. As expected, non-Hispanic white women ($M = 3.30, SD = 0.74$) scored significantly higher on the Anglo orientation scale compared to Hispanic women ($M = 2.43, SD = 0.92$), $t(521.55) = 11.94, p < .001$, whereas Hispanic women ($M = 3.26, SD = 0.75$) scored significantly higher on the Spanish orientation scale compared to non-Hispanic women white ($M = 1.47, SD = 0.66$), $t(492.95) = -29.38, p < .001$. Both of these independent samples t-tests violated Levene's Test and so the degrees of freedom were adjusted from 532 to 521.554 for average orientation to Anglo culture and 543 to 492.95 for orientation to Spanish culture, respectively. Overall, non-Hispanic white women endorsed a high level of orientation to Anglo culture and a low level of orientation to Mexican/Spanish culture. Hispanic women in this sample endorsed a high level of orientation to Mexican/Spanish culture and a moderately high level of orientation to Anglo culture.

Ethnic Identification and EDE-Q Global Scores

Correlation analyses indicated that neither Anglo orientation, $r(534) = 0.01$, nor Mexican/Spanish orientation, $r(545) = 0.03$, were significantly related to EDE-Q scores. When relationships between EDE-Q scores and cultural orientation were analyzed separately for the two ethnic groups, orientation to Anglo culture $r(220) = 0.10$, and Mexican/Spanish culture $r(212) = -0.02$, were not significantly related to EDE-Q global scores in non-Hispanic white women. For Hispanic women, neither orientation to Anglo, $r(314) = -0.05$, nor Mexican/Spanish, $r(314) = -0.09$, culture was significantly related to EDE-Q global scores.

Ethnic Identification and EDE-Q *Subscale* Scores

Given the findings regarding ethnic identification and EDE-Q global scores yielded non-significant results, further analyses tested the relationship of ethnic identification and EDE-Q subscale scores. Neither orientation to Anglo or Spanish culture was correlated with EDE-Q subscale scores. When correlations between EDE-Q subscale scores and orientation to Anglo or Spanish culture were examined separately for each ethnic group, neither cultural orientation was significantly related to subscale scores for non-Hispanic white women. For Hispanic women, orientation to Spanish culture was significantly related to the weight concern subscale, $r(333) = 0.12, p = 0.03$.

Regression analyses were conducted to determine whether orientation to Anglo or Spanish culture was predictive of EDE-Q *subscale* scores. The results indicated that orientation to Anglo culture was not significantly predictive of any EDE-Q subscale scores. When regression analyses were conducted separately for non-Hispanic and Hispanic undergraduate women, both orientation to Anglo and Spanish culture were not significantly predictive of any EDE-Q subscale scores for non-Hispanic white and Hispanic college women, respectively.

DISCUSSION

This study investigated the factor structure and measurement invariance of the EDE-Q in a non-clinical sample of non-Hispanic white and Hispanic undergraduate women. CFAs were conducted to examine how well six previously published factor structures fit this sample. A test of measurement invariance was conducted to compare the construct validity of the EDE-Q across ethnic groups. Additionally, given the relative paucity of literature on normative data and validity of the EDE-Q in non-clinical samples of Hispanic women, and yet the increasing rates of EDs in ethnic minority women (Franko, 2007; Hudson et al., 2007), normative data were provided on the EDE-Q for this sample of Hispanic women. Finally, the role of acculturation to the dominant culture was investigated as a potentially important factor influencing variation in EDE-Q scores and construct validity, especially for Hispanic undergraduate women.

Factor Structure of the EDE-Q

Confirmatory factor analyses found that only the modified 7-item, 3 factor structure published by Grilo and colleagues (Grilo et al., 2013; 2015) was an acceptable fit of the data in these non-clinical samples of non-Hispanic white and Hispanic undergraduate women. Previously published four (Fairburn & Beglin, 1994), three (Peterson et al., 2007), two (Becker et al., 2009), one (Pennings & Wojciechowski, 2004), and brief one factor (Allen et al., 2011; Byrne et al., 2010) structures were a poor fit of the data in the current sample. Perhaps it is not surprising that the original four factor EDE-Q structure proposed by Fairburn and Beglin (1994) was a poor fit of the data, given that the original four factors were based on a conceptual understanding of how the items would group together, as opposed to being the result of empirical

testing (Cooper et al, 1989). The original factor structure has yet to be replicated in several factor analytic studies of the EDE-Q in both clinical and non-clinical populations (Allen et al., 2011).

There may be several explanations for why other proposed EDE-Q factor structures were a poor fit of the data, and why both the current and previous studies have had difficulty replicating these factor structures across samples (Allen et al., 2011). The three factor (Peterson et al., 2007) and brief one factor (Allen et al., 2011; Byrne et al., 2010) models were developed using clinical samples of ED patients. There is some evidence to suggest that factor structures of the EDE-Q that are an acceptable fit in ED patients are a poor fit in community samples (Byrne et al., 2010). The low rate of endorsement of EDE-Q items in the current non-clinical sample may have impacted the fit of these factor structures. Further, EFAs are data-driven and do not necessarily reflect underlying theory, and therefore a model that fits well in one sample may not fit well in another sample (Kline, 2011).

Both the previously developed two factor (Becker et al., 2009) and one factor (Pennings & Wojciechowski, 2004) models were derived from Fijian and Dutch samples of participants using translated versions of the EDE-Q. Given that the EDE-Q was not invariant across ethnic identity in the current study, it is reasonable to conclude that these previously reported structures were not an adequate fit of the data in this sample due to cultural differences. The translation of the EDE-Q into other languages may also explain why these respective factor structures did not replicate.

Grilo et al. (2015) found that their modified 7-item, 3 factor structure of the EDE-Q in a sample of male and female college students was a good fit of the data. This modified three factor structure had first been established in a sample of bariatric surgery candidates (Grilo et al.,

2013), and thus the authors concluded that this modified EDE-Q could be an effective screening tool across gender, age, and weight status. In the current study we were able to replicate the 7-item, 3 factor structure in a *diverse*, non-clinical undergraduate sample. However, in the current sample, the factor structure was only an adequate model fit of the data. Specifically, the RMSEA fit index was particularly problematic, suggesting that this model was not adequately explaining the variance, and that the reduction from 22 items to 7 items may have been problematic. However, RMSEA, like the χ^2 statistics, are influenced by degrees of freedom. The reduced degrees of freedom may have positively biased the RMSEA results, suggesting a poorer fit than actually warranted (Kline, 2011).

Overall, these findings call into question the use of the theorized subscales and the standard scoring system of the EDE-Q, and more generally demonstrate the difficulties in determining and replicating previously reported EDE-Q factor structures. Findings from both earlier studies and the current study support the use of the EDE-Q with fewer items and a different factor structure, especially when considering *diverse* populations. Nonetheless, the findings from this study do add support to a modified 7 item version of the EDE-Q. This modified 3 factor structure holds promise as a valid screening tool for ED pathology, particularly with diverse samples of undergraduate women.

Measurement Invariance of the EDE-Q

Tests of measurement invariance across non-Hispanic white and Hispanic participants achieved configural invariance, but failed to achieve weak or metric invariance. This indicates that the same latent constructs (dietary restraint, shape/weight overvaluation, and body dissatisfaction) are being measured across groups and that the same items load onto the latent

constructs in the two samples. However, the lack of metric invariance suggests that items load differently onto the latent constructs across non-Hispanic white and Hispanic women. The lack of invariance warrants caution when using the EDE-Q to make comparisons across non-clinical samples of non-Hispanic white and Hispanic undergraduate women. This finding is in contrast to previous tests of measurement invariance that found the EDE-Q to be invariant across age, weight status, gender, and residence (Grilo et al., 2015; Peñelo et al., 2013). However, this was the first invariance test on the EDE-Q across ethnicity.

Tests of measurement invariance on other measures of ED symptomatology and body dissatisfaction across non-Hispanic white and Hispanic women have yielded mixed results with some tests finding invariance (Belon et al., 2011; Warren et al., 2008) and others finding a lack of invariance (Belon et al., 2015). Belon et al. (2015) suggested that the lack of invariance potentially could be explained by level of acculturation. In the current sample, Hispanic undergraduate women were highly acculturated to Mexican/Spanish culture and were moderately acculturated to Anglo/White culture, with some within-group differences in level of acculturation. Measurement invariance may have been more likely in a more highly acculturated ethnic minority sample with less within-group variation. More generally, previous research demonstrated problems with the validity of the EDE-Q and this may contribute to the lack of invariance across groups in this sample.

Model Respecification and Structural Equation Modeling of the EDE-Q

To determine a better fitting model in the Hispanic sample and understand potential sources of the lack of measurement invariance, nested CFAs in which residuals were correlated on the 7-item, 3 factor structure in Hispanic undergraduate women were conducted. The final

model was a good fit of the data, and results suggested that the overvaluation of shape and dissatisfaction of shape indicators overlapped in Hispanic undergraduate women. In previous literature, there were different standards of ideal body size and shape among Hispanic women, and the Hispanic culture was more likely to be accepting of curvier, voluptuous body types (Chamorro & Flores-Ortiz, 2000; Franko et al., 2012). However, qualitative research among Hispanic college women demonstrated that there is often conflict between being thin and having curves (Franko et al., 2012). Additionally, other research showed that Hispanic women choose larger ideal figures when considering the ideal figure for their ethnic group, but similar ideal figures to non-Hispanic white women when considering a personal ideal figure (Gordon et al., 2010). Thus, for Hispanic women there seemed to be higher acceptance of larger body sizes but also a value of and drive toward thinness that is affected by level of acculturation (Poloskov & Tracey, 2013).

When examining the effect of acculturation on ethnicity and EDE-Q factor structure, SEM analyses determined that level of acculturation to Anglo/White culture was a significant exogenous predictor of dietary restraint, shape/weight overvaluation, and body dissatisfaction. Ethnicity was also a significant exogenous predictor of the latent constructs. Consequently, both ethnicity and acculturation appear to be important factors in EDE-Q response pattern and may potentially explain the lack of measurement invariance across groups, especially considering within-group differences in orientation to Anglo/White culture among Hispanic women in the current sample.

Overall, these findings speak to the larger difficulties of measuring ED pathology in racially and ethnically diverse groups. In line with the current study research commonly has

failed to find empirical support for the invariance of many popular body dissatisfaction and ED measures across ethnicity (Belon et al., 2015; Kelly et al., 2012; Rutt et al., 2001). This lack of invariance makes comparisons between groups on these measures extremely problematic, which in turn makes it difficult to understand racial/ethnic differences in ED prevalence and the protective or risk factor mechanisms that may be driving these differences. One potential solution would be to develop separate ED measures for racially/ethnically diverse groups. Such measures could become vitally important for future research and clinical practice, given the increasing prevalence rates of body dissatisfaction and EDs in minority women (Croll et al., 2002; Hudson et al., 2007; Shaw et al., 2004).

Effect of Acculturation on EDE-Q Scores and Construct Validity

The findings from the current study, which show the importance of acculturation when considering ethnic differences in the scores and construct validity of the EDE-Q, reflect the theory underlying the socio-cultural model of EDs (Thompson et al., 1999). The current study found that higher rates of acculturation to Anglo/White culture was associated with increased restraint of eating, shape/weight overvaluation, and body dissatisfaction even when taking into account differences in BMI. This pattern of results adds support to previous reports in the literature and hypotheses put forth by the sociocultural model of EDs, which found that level of acculturation was a risk factor for greater body dissatisfaction and ED pathology (Alegria et al., 2007; Cachelin et al., 2006). According to the sociocultural model of EDs, restraint, overvaluation of weight/shape, and body dissatisfaction should all increase as level of acculturation to the dominant culture increases as seen in this sample.

Despite some within-group variation in level of acculturation to Anglo/White culture among Hispanic women, most of our sample of Hispanic women were highly or moderately acculturated to Anglo/White culture. Hispanic women that are moderately acculturated may be struggling to resolve the discrepancy they see between the body ideals of their ethnic identity and the body ideals of the dominant culture. This discrepancy and the mixed messages they receive may cause dissatisfaction with size and shape (Franko et al., 2012). Additionally, these women are more likely to struggle with norms regarding patterns of food consumption. Focus group studies about weight loss treatment in Mexican American women have emphasized the importance of traditional foods (Lindberg & Stevens, 2011; McLaughlin et al, 2016), and yet these traditional foods and food patterns might not align with the restrained eating patterns of the dominant culture. Hispanic women that are moderately acculturated (e.g., value both Mexican/Spanish and Anglo/White culture) may still be trying to determine how to handle these discrepant messages regarding food and body shape. Since the majority of Hispanic women in the current sample were moderately acculturated, their attempts to navigate these discrepant messages may explain the increased rates of binge eating in Hispanic women in general in the study.

The pronounced effect of acculturation on ED pathology and the lack of measurement invariance across ethnically diverse groups in the current study may highlight problems with the Diagnostic Statistical Manual (DSM) criteria mapping onto and capturing ED pathology in Hispanic women. Previous findings by Alegria et al. (2007) have found that the categorical nosology of EDs may be rooted in a Western conceptualization of ED pathology that may not generalize to Latina women. Future work is needed to understand the manifestation and

conceptualization of EDs across ethnically diverse groups, and to design assessment/diagnostic instruments that capture these differences.

Normative Data on EDE-Q Scores in Non-clinical, Hispanic Undergraduate Women

The reported norms for the Hispanic sample should be interpreted with caution because of the lack of measurement invariance. However, since the EDE-Q is a widely used, standard eating disorder measure, it was important to add to the literature regarding normative data in samples of non-clinical undergraduate Hispanic women. There were no significant differences between EDE-Q subscale and global scores between non-Hispanic white and Hispanic undergraduate women. This is in line with similar findings that suggest rates of ED symptomatology are similar across Caucasian and Latina women (Franko, 2007; Smolak & Striegel-Moore, 2001). The cut-off score of 4 or greater on any subscale or global scale in undergraduate populations as suggested by Luce et al. (2008) and Mond et al. (2006) may be appropriate for Hispanic undergraduate women when considering use of the EDE-Q as a clinical screening tool. However, further research is needed to understand how the EDE-Q factor structure and construct validity affect EDE-Q norms across different populations, specifically ethnic and racial minority groups.

The EDE-Q also includes behavioral measures of ED symptoms, including frequency of vomiting, laxative use, compulsive exercise, and objective/subjective binge eating. There were significant differences on these behavioral measures between non-Hispanic white and Hispanic undergraduate women, such that Hispanic women were more likely to report episodes of objective and subjective binge eating compared to non-Hispanic white women. This finding is consistent with previous literature suggesting that Latina women have elevated rates of binge

eating and binge eating disorder (Alegria et al., 2007). Although Fairburn and Beglin (1994) caution that the EDE-Q may overestimate the presence of behavioral ED symptoms, it is important to note these self-reported elevated rates of binge eating in Hispanic undergraduate women.

Limitations and Future Directions

There are several limitations to this study that must be considered. First, participants self-reported their ethnic identity, and additional data on country of origin, generational status, and language spoken were not collected. These variables may be important when looking at variations in body dissatisfaction and EDs across ethnic groups. Second, the measure of acculturation, although supported by the literature, is less informative than newer measures of acculturation, such as the Scale of Ethnic Experience (SEE; Malcarne et al., 2006). Using a more comprehensive measure of acculturation in future studies may help to better understand which aspects of acculturation influence body dissatisfaction and ED symptomatology in ethnic minority women. Third, the current sample did not include a clinical population of ED patients, and thus it is not possible to generalize our findings to clinical samples. This may be an important area of future research given the increasing rates of EDs among ethnic minority women (Hudson et al., 2007). Finally, since this sample consisted entirely of college women our findings cannot be generalized to men, different age groups, or across educational statuses. Future research should look at the modified three factor structure of the EDE-Q in different samples in order to test for its utility as an assessment measure of ED pathology.

Conclusions

A modified 7 item, 3 factor structure of the EDE-Q was an acceptable fit of the data in this sample of non-clinical non-Hispanic and Hispanic undergraduate women. This factor structure has been found to fit the data in other college samples and in obese patients presenting for bariatric surgery (Grilo et al. 2013; Grilo et al., 2015). These findings support the use of this modified version of the EDE-Q in research and clinical practice. However, tests of measurement invariance indicated that the measure is not the same across non-Hispanic and Hispanic women. This is an important finding for researchers to consider when trying to make comparisons across groups. Acculturation seems to be an important factor influencing EDE-Q scores above and beyond the effect of ethnic identity.

Table 1

Previously published factor structures of the Eating Disorder Examination Questionnaire (EDE-Q)

<u>Reference</u>	<u>N</u>	<u>Sample</u>	<u>Factor Structure</u>
Allen et al. (2011)	439	228 Female ED Patients; 211 Female University Students	8 item; 1 factor
Becker et al. (2009)	532	Fijian Adolescent Females	22 item; 2 factor
Byrne et al. (2010)	657	158 Female ED Patients; 170 Female Obese Patients; 329 Female Community Members	8 item; 1 factor
Darcy et al. (2013)	1637	432 Male University Athletes; 544 Female University Athletes; 229 Male University Non-Athletes; 429 Female University Non-Athletes	21 item; 3 factor 19 item; 3 factor 19 item; 2 factor 18 item; 3 factor
Fairburn & Beglin (1994)	243	36 Female ED Patients; 207 Female Community Members	22 item; 4 factor
Grilo et al. (2013)	174	Obese Bariatric Surgery Candidates	7 item; 3 factor
Grilo et al. (2015)	801	537 Female University Students; 228 Male University Students	7 item; 3 factor
Hrabosky et al. (2008)	337	Obese Bariatric Surgery Candidates	12 item; 4 factor
Pennings &	1491	935 Female ED	22 item; 1 factor

Wojciechowski (2004)		Patients; 235 Female Community Members	
Peterson et al. (2007)	203	Symptomatic Bulimic Women	22 item; 3 factor
White et al. (2014)	917	522 Adolescent Girls; 395 Adolescent Boys	22 item; 3 factor

Table 2

Sample characteristics

Demographic Characteristic	Frequency (n)	Percentage (%)
<u>Age</u>		
18-19	353	63.6%
20-21	117	21.1%
22-23	33	5.9%
24-25	13	2.3%
26+	39	7.0%
<u>Ethnicity</u>		
Non-Hispanic White	221	39.8%
Hispanic	334	60.2%
<u>Marriage Status</u>		
Married and living with husband	31	5.6%
Married but not living with husband	3	0.5%
Never married	512	92.3%
Divorced	7	1.3%
Separated	1	0.2%
Widowed	0	0.0%
Missing	1	0.2%
<u>Education</u>		
Completed junior year in high school	2	0.4%
Graduated from high school or GED	275	49.5%
Completed at least 1 year of college	113	20.4%
Completed an associate's degree or equivalent	71	12.8%
Completed 3 years of college	74	13.3%
Completed a bachelor's degree	13	2.3%
Completed some graduate school	1	0.2%
Completed a master's degree	1	0.2%
Other	5	0.9%
<u>Body Mass Index (BMI)</u>		
Underweight (<18.5)	35	6.3%
Normal Weight (18.5-24.9)	356	64.1%
Overweight (25-29.9)	100	18.0%
Obese (>30)	56	10.2%
Missing	8	1.4%

Table 3

Descriptive statistics for the Eating Disorder Examination Questionnaire (EDE-Q)

<u>Item</u>	<u>M</u>	<u>SD</u>	<u>Skewness</u>	<u>Kurtosis</u>
Restraint over eating (Item 1)	2.23	2.14	0.58	-1.06
Avoidance of eating (Item 2)	0.52	1.11	2.85	8.75
Food avoidance (Item 3)	2.36	2.12	0.48	-1.13
Dietary rules (Item 4)	1.76	2.11	0.92	-0.58
Empty stomach (Item 5)	0.65	1.37	2.35	4.86
Flat stomach (Item 6)	3.56	2.38	-0.27	-1.60
Preoccupation with food, eating, calories (Item 7)	0.72	1.32	2.25	4.97
Preoccupation with weight and shape (Item 8)	1.02	1.63	1.81	2.35
Fear of losing control over eating (Item 9)	0.84	1.66	2.16	3.57
Fear of weight gain (Item 10)	2.39	2.32	0.50	-1.32
Feelings of fatness (Item 11)	2.91	2.15	0.24	-1.42
Desire to lose weight (Item 12)	3.13	2.47	-0.01	-1.69
Eating in secret (Item 19)	0.28	0.72	3.78	17.48
Guilt after eating (Item 20)	1.32	1.65	1.25	0.51
Social eating (Item 21)	0.70	1.34	2.08	3.68
Importance of weight (Item 22)	2.49	2.03	0.34	-1.16
Importance of shape (Item 23)	2.57	1.96	0.30	-1.10
Reaction to prescribed weighing (Item 24)	1.42	1.76	1.04	-0.10
Dissatisfaction with weight (Item 25)	2.83	2.12	0.20	-1.36
Dissatisfaction with shape (Item 26)	2.86	1.96	0.16	-1.25
Discomfort seeing body (Item 27)	2.76	2.00	0.15	-1.26
Avoidance of exposure (Item 28)	2.91	2.13	0.12	-1.35

Table 4

Inter-item correlations of Eating Disorder Examination Questionnaire (EDE-Q)

	<u>Item 1</u>	<u>Item 2</u>	<u>Item 3</u>	<u>Item 4</u>	<u>Item 5</u>	<u>Item 6</u>	<u>Item 7</u>	<u>Item 8</u>
Item 1								
Item 2	0.41							
Item 3	0.60	0.32						
Item 4	0.57	0.28	0.66					
Item 5	0.42	0.63	0.25	0.28				
Item 6	0.40	0.31	0.39	0.32	0.35			
Item 7	0.39	0.31	0.32	0.39	0.39	0.35		
Item 8	0.43	0.40	0.35	0.36	0.46	0.37	0.75	
Item 9	0.39	0.34	0.25	0.24	0.46	0.30	0.45	0.49
Item 10	0.55	0.42	0.48	0.43	0.44	0.52	0.49	0.62
Item 11	0.52	0.38	0.45	0.39	0.44	0.46	0.43	0.55
Item 12	0.62	0.39	0.55	0.49	0.42	0.56	0.41	0.53
Item 19	0.20	0.16	0.18	0.18	0.23	0.10	0.24	0.31
Item 20	0.51	0.39	0.40	0.38	0.49	0.36	0.49	0.56
Item 21	0.30	0.31	0.24	0.29	0.33	0.22	0.39	0.43
Item 22	0.50	0.35	0.43	0.38	0.42	0.40	0.47	0.59
Item 23	0.44	0.36	0.38	0.35	0.43	0.39	0.46	0.58
Item 24	0.25	0.28	0.18	0.13	0.29	0.26	0.34	0.38
Item 25	0.50	0.33	0.42	0.36	0.37	0.36	0.41	0.51
Item 26	0.50	0.34	0.41	0.39	0.41	0.45	0.42	0.54
Item 27	0.45	0.28	0.38	0.38	0.37	0.43	0.43	0.52
Item 28	0.49	0.29	0.30	0.38	0.37	0.45	0.41	0.51

** All inter-item correlations are $p < .001$

	<u>Item 9</u>	<u>Item 10</u>	<u>Item 11</u>	<u>Item 12</u>	<u>Item 19</u>	<u>Item 20</u>	<u>Item 21</u>	<u>Item 22</u>
Item 1								
Item 2								
Item 3								
Item 4								
Item 5								
Item 6								
Item 7								
Item 8								
Item 9								
Item 10	0.52							
Item 11	0.42	0.73						
Item 12	0.38	0.74	0.81					
Item 19	0.25	0.25	0.29	0.22				
Item 20	0.51	0.64	0.62	0.60	0.40			
Item 21	0.39	0.43	0.46	0.40	0.46	0.55		
Item 22	0.38	0.68	0.67	0.65	0.28	0.60	0.47	
Item 23	0.38	0.62	0.62	0.58	0.33	0.59	0.47	0.86
Item 24	0.29	0.42	0.48	0.45	0.19	0.41	0.36	0.49
Item 25	0.37	0.65	0.77	0.77	0.26	0.61	0.47	0.74
Item 26	0.36	0.63	0.76	0.76	0.25	0.60	0.44	0.70
Item 27	0.36	0.61	0.74	0.70	0.21	0.58	0.44	0.70
Item 28	0.37	0.63	0.72	0.71	0.23	0.56	0.46	0.69

** All inter-item correlations are $p < .001$

	<u>Item 23</u>	<u>Item 24</u>	<u>Item 25</u>	<u>Item 26</u>	<u>Item 27</u>
Item 1					
Item 2					
Item 3					
Item 4					
Item 5					
Item 6					
Item 7					
Item 8					
Item 9					
Item 10					
Item 11					
Item 12					
Item 19					
Item 20					
Item 21					
Item 22					
Item 23					
Item 24	0.50				
Item 25	0.68	0.51			
Item 26	0.71	0.47	0.83		
Item 27	0.67	0.51	0.77	0.83	
Item 28	0.69	0.50	0.76	0.76	0.83

** All inter-item correlations are $p < .001$

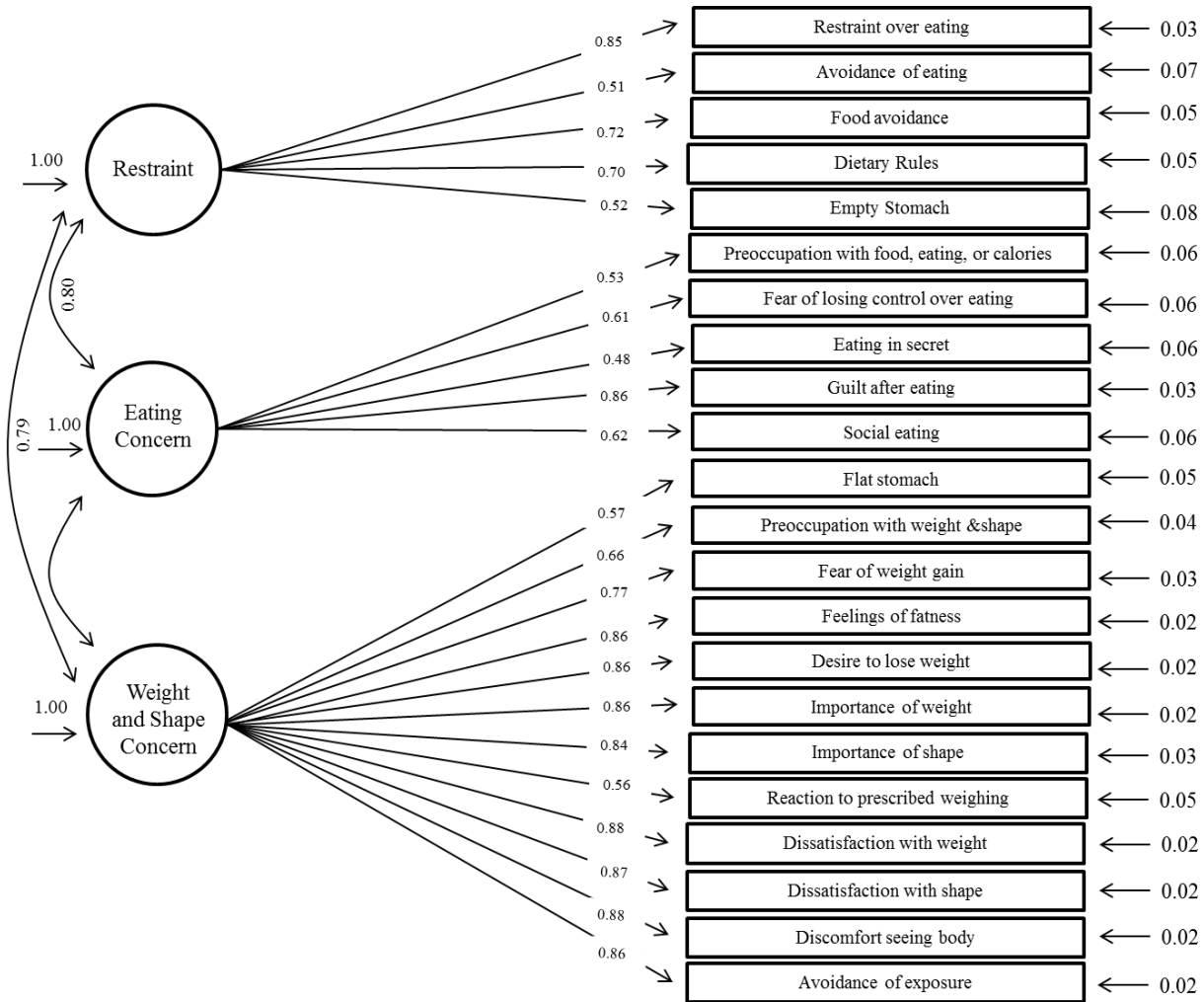


Figure 1. Confirmatory factor analysis (CFA) of a three factor model of the Eating Disorder Examination Questionnaire (EDE-Q) with standardized factor loadings and residuals in non-Hispanic undergraduate women.

Table 5

Unstandardized estimates and residuals for confirmatory factor analysis (CFA) of a three factor structure of the Eating Disorder Examination Questionnaire (EDE-Q) in non-Hispanic undergraduate women

<u>Latent Factor</u>	<u>Item</u>	<u>Estimate</u>	<u>Standard Error</u>
Restraint	Restraint over eating	1.00	0.00
	Avoidance of eating	0.32**	0.07
	Food avoidance	0.83**	0.06
	Dietary rules	0.84**	0.07
	Empty stomach	0.40**	0.09
Eating Concern	Preoccupation with food, eating, calories	1.00	0.00
	Fear of losing control over eating	1.48**	0.24
	Eating in secret	0.47**	0.11
	Guilt after eating	1.96**	0.31
	Social eating	1.14**	0.18
Weight and Shape Concern	Preoccupation with weight and shape	1.00	0.00
	Flat stomach	1.32**	0.17
	Fear of weight gain	1.70**	0.16
	Feelings of fatness	1.76**	0.17
	Desire to lose weight	1.70**	0.18
	Importance of weight	1.65**	0.16
	Importance of shape	1.56**	0.16
	Reaction to prescribed weighing	0.95**	0.13
	Dissatisfaction with weight	1.70**	0.18
	Dissatisfaction with shape	1.63**	0.17
Discomfort seeing body	1.62**	0.17	
Avoidance of exposure	1.69**	0.18	

Note. * $p < .05$, ** $p < 0.01$

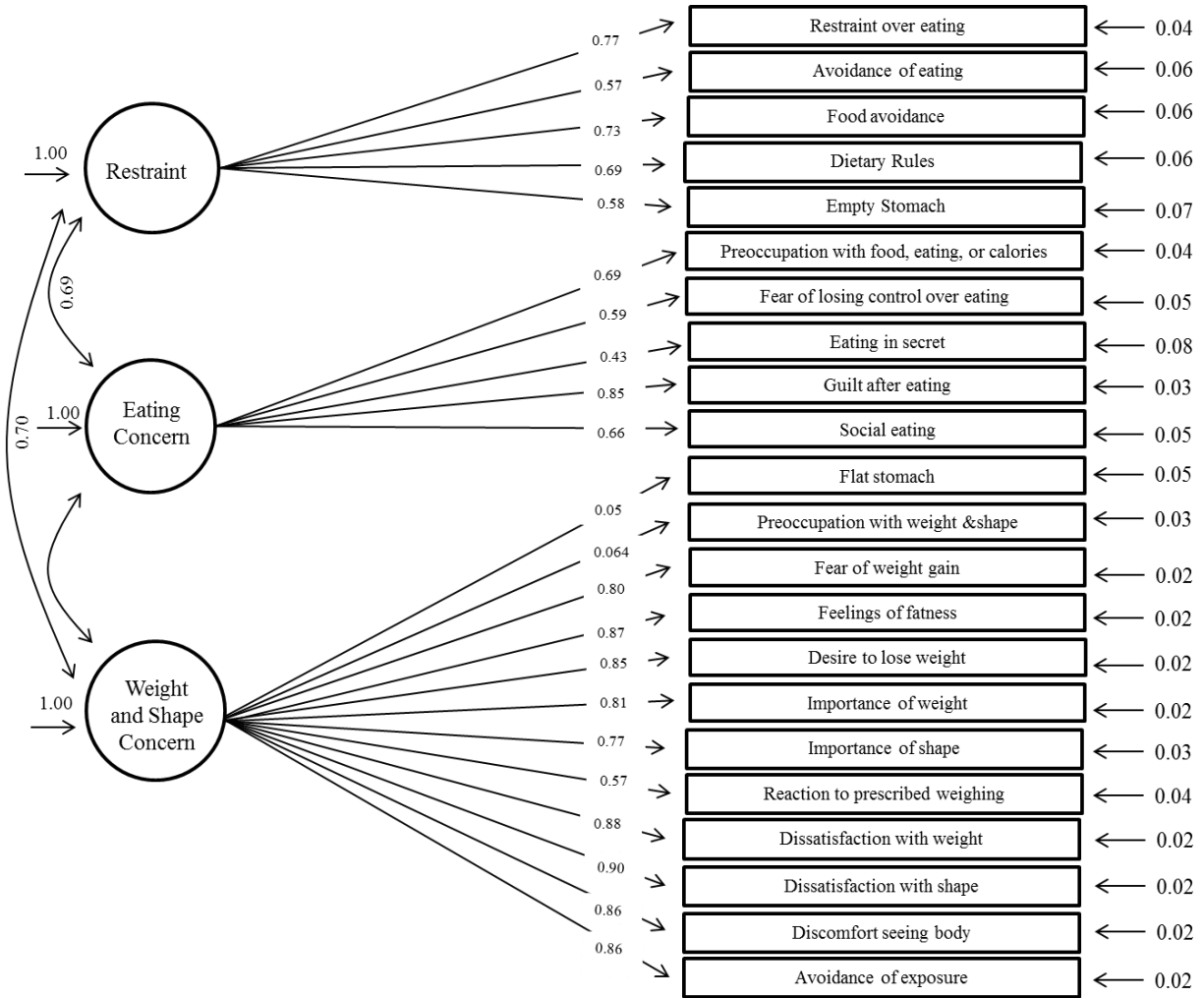


Figure 2. Confirmatory factor analysis (CFA) of a three factor model of the Eating Disorder Examination Questionnaire (EDE-Q) with standardized factor loadings and residuals in Hispanic undergraduate women.

Table 6

Unstandardized estimates and residuals for confirmatory factor analysis (CFA) of a three factor structure of the Eating Disorder Examination Questionnaire (EDE-Q) in Hispanic undergraduate women

<u>Latent Factor</u>	<u>Item</u>	<u>Estimate</u>	<u>Standard Error</u>
Restraint	Restraint over eating	1.00	0.00
	Avoidance of eating	0.38**	0.06
	Food avoidance	0.94**	0.10
	Dietary rules	0.87**	0.09
	Empty stomach	0.48**	0.07
Eating Concern	Preoccupation with food, eating, calories	1.00	0.00
	Fear of losing control over eating	1.48**	0.24
	Eating in secret	0.47**	0.11
	Guilt after eating	1.96**	0.31
	Social eating	1.14**	0.18
Weight and Shape Concern	Preoccupation with weight and shape	1.00	0.00
	Flat stomach	1.32**	0.17
	Fear of weight gain	1.70**	0.16
	Feelings of fatness	1.76**	0.17
	Desire to lose weight	1.70**	0.18
	Importance of weight	1.65**	0.16
	Importance of shape	1.56**	0.16
	Reaction to prescribed weighing	0.95**	0.13
	Dissatisfaction with weight	1.70**	0.18
	Dissatisfaction with shape	1.63**	0.17
Discomfort seeing body	1.62**	0.17	
Avoidance of exposure	1.69**	0.18	

Note. * $p < .05$, ** $p < 0.01$

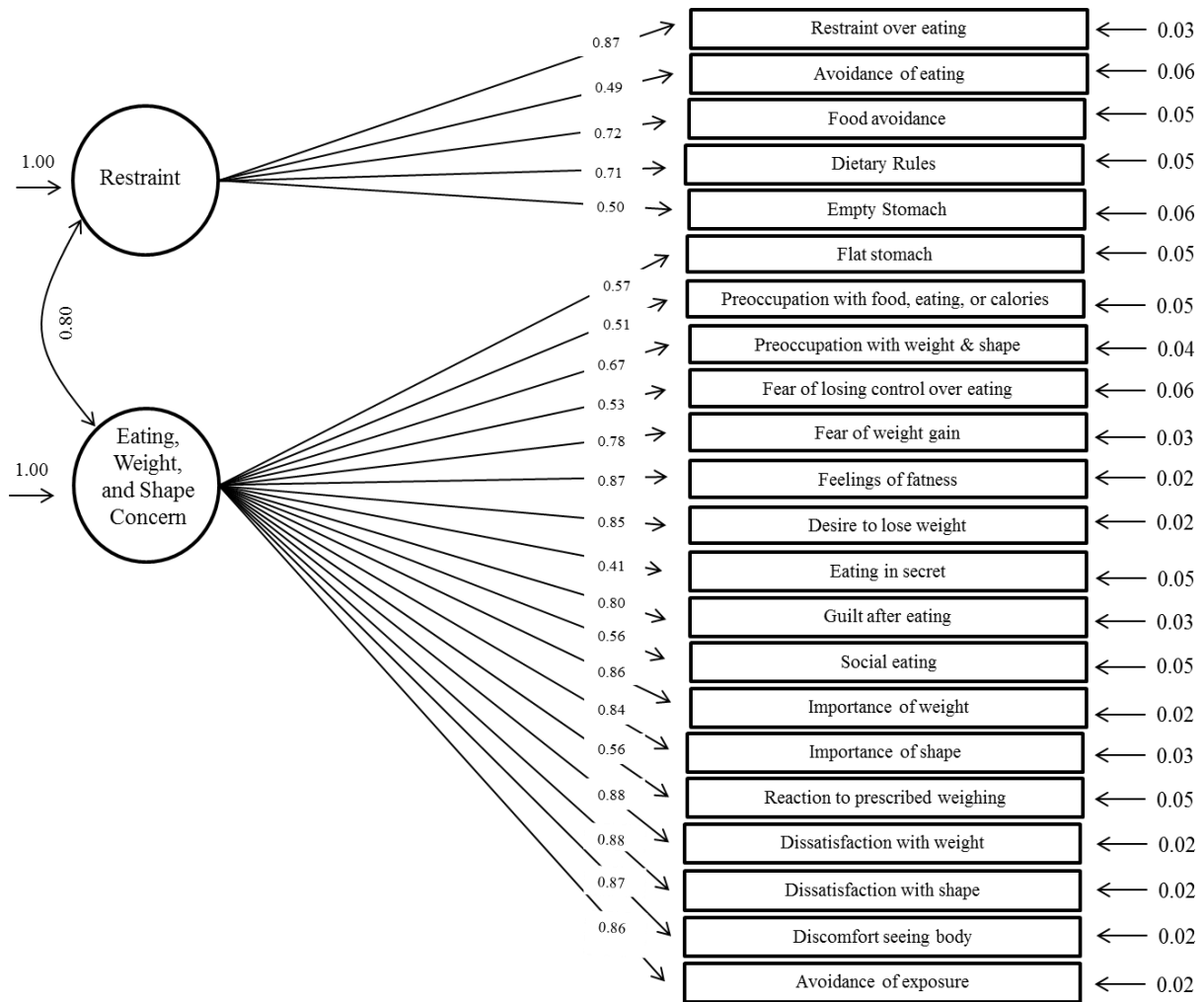


Figure 3. Confirmatory factor analysis (CFA) of a two factor model of the Eating Disorder Examination Questionnaire (EDE-Q) with standardized factor loadings and residuals in non-Hispanic undergraduate women.

Table 7

Unstandardized estimates and residuals for confirmatory factor analysis (CFA) of a two factor structure of the Eating Disorder Examination Questionnaire (EDE-Q) in non-Hispanic undergraduate women

<u>Latent Factor</u>	<u>Item</u>	<u>Estimate</u>	<u>Standard Error</u>
Restraint	Restraint over eating	1.00	0.00
	Avoidance of eating	0.30**	0.06
	Food avoidance	0.83**	0.06
	Dietary rules	0.84**	0.06
	Empty stomach	0.38**	0.08
Weight, Eating, and Shape Concern	Flat stomach	1.00	0.00
	Preoccupation with food, eating, or calories	0.49**	0.08
	Preoccupation with weight and shape	0.77**	0.10
	Fear of losing control over eating	0.66**	0.11
	Fear of weight gain	1.30**	0.13
	Feelings of fatness	1.33**	0.13
	Desire to lose weight	1.54**	0.14
	Eating in secret	0.20**	0.04
	Guilt after eating	0.93**	0.11
	Social eating	0.52**	0.09
	Importance of weight	1.25**	0.13
	Importance of shape	1.20**	0.12
	Reaction to prescribed weighing	0.72**	0.10
	Dissatisfaction with weight	1.29**	0.13
	Dissatisfaction with shape	1.23**	0.12
Discomfort seeing body	1.23**	0.12	
Avoidance of exposure	1.28**	0.12	

Note. * $p < .05$, ** $p < 0.01$

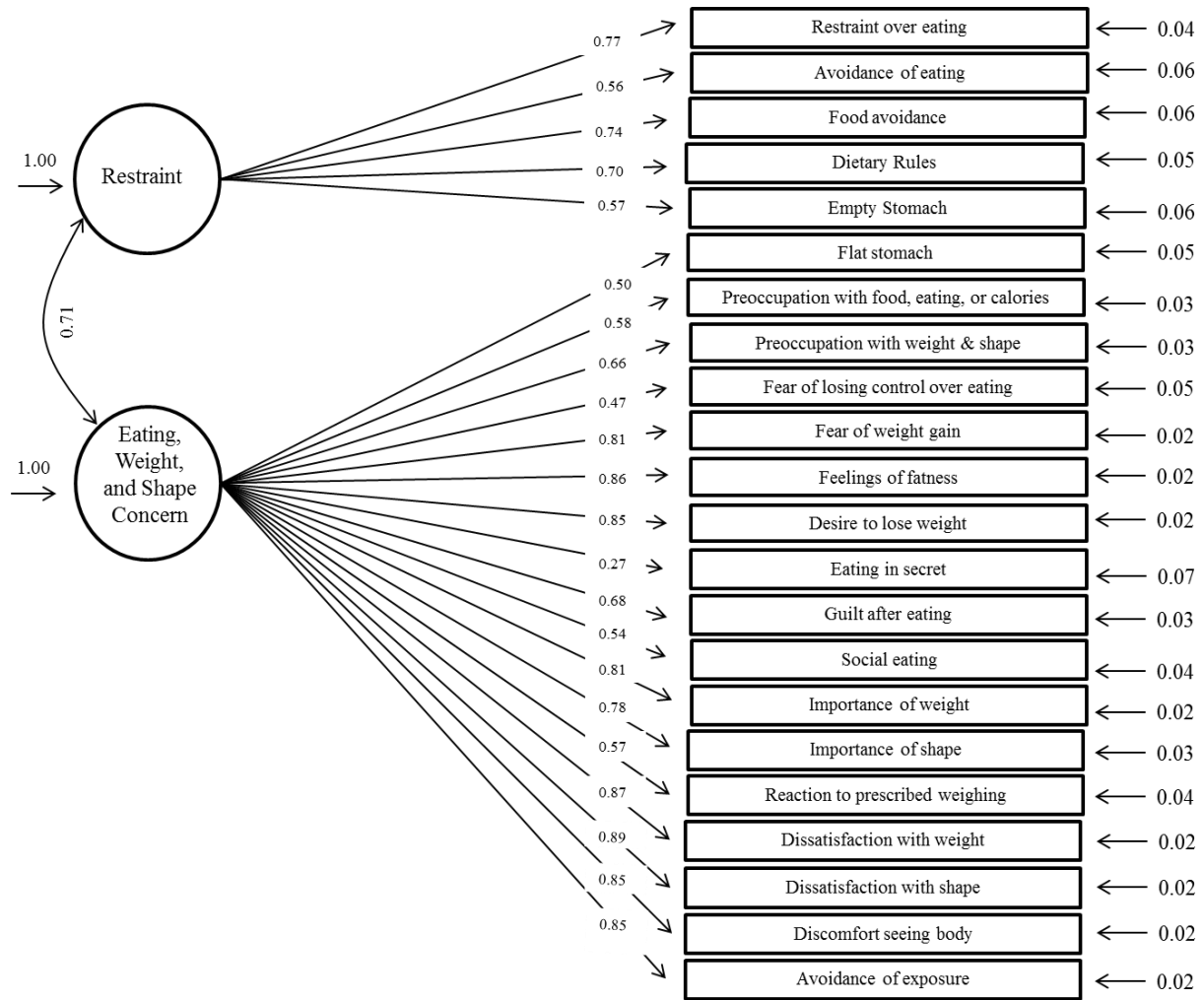


Figure 4. Confirmatory factor analysis (CFA) of a two factor model of the Eating Disorder Examination Questionnaire (EDE-Q) with standardized factor loadings and residuals in Hispanic undergraduate women.

Table 8

Unstandardized estimates and residuals for confirmatory factor analysis (CFA) of a two factor structure of the Eating Disorder Examination Questionnaire (EDE-Q) in Hispanic undergraduate women

<u>Latent Factor</u>	<u>Item</u>	<u>Estimate</u>	<u>Standard Error</u>
Restraint	Restraint over eating	1.00	0.00
	Avoidance of eating	0.38**	0.06
	Food avoidance	0.96**	0.10
	Dietary rules	0.89**	0.09
	Empty stomach	0.47**	0.07
Weight, Eating, and Shape Concern	Flat stomach	1.00	0.00
	Preoccupation with food, eating, or calories	0.64**	0.08
	Preoccupation with weight and shape	0.94**	0.11
	Fear of losing control over eating	0.64**	0.10
	Fear of weight gain	1.60**	0.14
	Feelings of fatness	1.58**	0.14
	Desire to lose weight	1.77**	0.15
	Eating in secret	0.17**	0.04
	Guilt after eating	0.97**	0.11
	Social eating	0.63**	0.09
	Importance of weight	1.40**	0.15
	Importance of shape	1.28**	0.14
	Reaction to prescribed weighing	0.84**	0.11
	Dissatisfaction with weight	1.62**	0.16
	Dissatisfaction with shape	1.50**	0.14
Discomfort seeing body	1.48**	0.14	
Avoidance of exposure	1.57**	0.15	

Note. * $p < .05$, ** $p < 0.01$

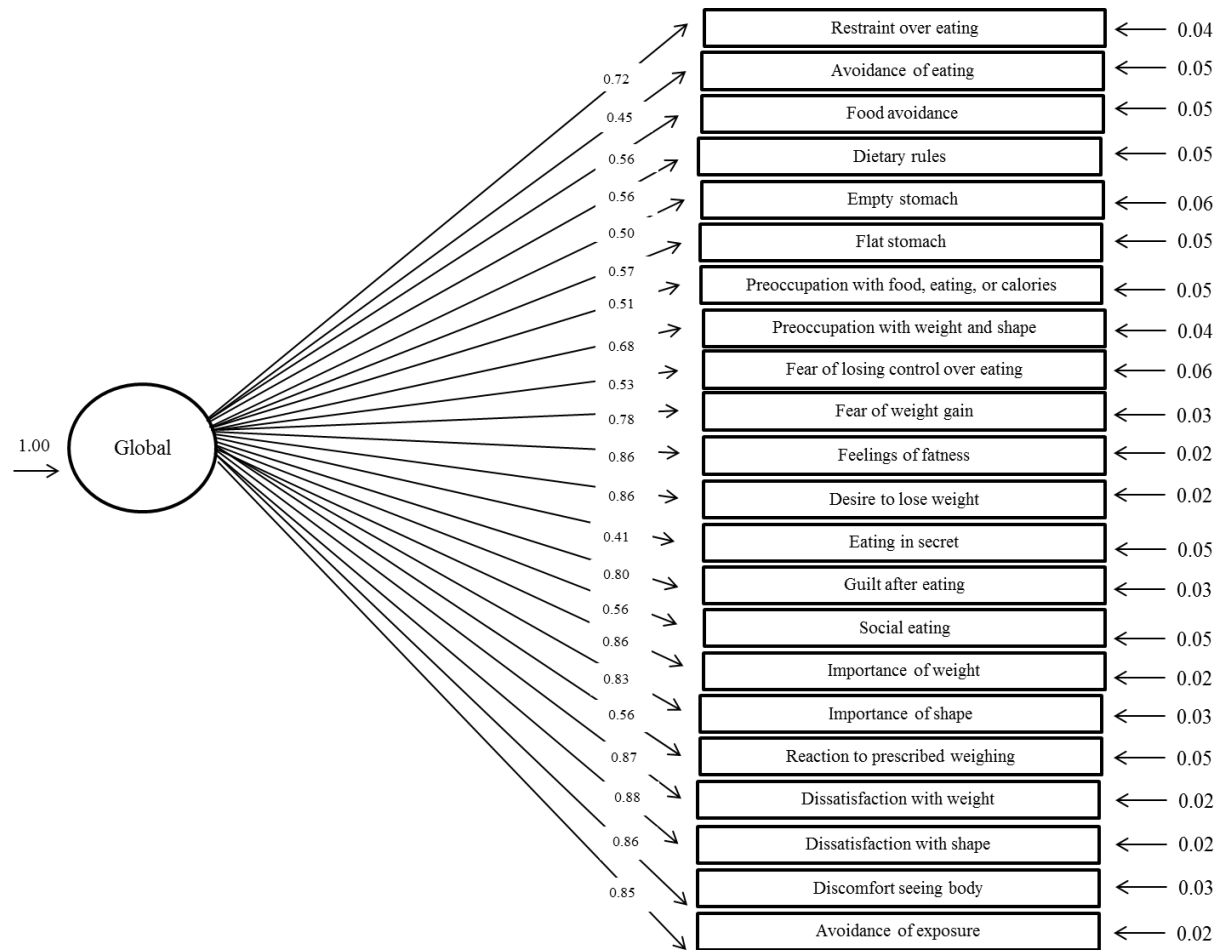


Figure 5. Confirmatory factor analysis (CFA) of a one factor model of the Eating Disorder Examination Questionnaire (EDE-Q) with standardized factor loadings and residuals in non-Hispanic undergraduate women.

Table 9

Unstandardized estimates and residuals for confirmatory factor analysis (CFA) of a one factor structure of the Eating Disorder Examination Questionnaire (EDE-Q) in non-Hispanic undergraduate women

<u>Latent Factor</u>	<u>Item</u>	<u>Estimate</u>	<u>Standard Error</u>
Global	Restraint over eating	1.00	0.00
	Avoidance of eating	0.33**	0.06
	Food avoidance	0.78**	0.07
	Dietary rules	0.80**	0.08
	Empty stomach	0.46**	0.08
	Flat stomach	0.91**	0.10
	Preoccupation with food, eating, or calories	0.45**	0.07
	Preoccupation with weight and shape	0.70**	0.08
	Fear of losing control over eating	0.60**	0.09
	Fear of weight gain	1.18**	0.09
	Feelings of fatness	1.20**	0.08
	Desire to lose weight	1.40**	0.09
	Eating in secret	0.19**	0.04
	Guilt after eating	0.85**	0.07
	Social eating	0.47**	0.07
	Importance of weight	1.13**	0.08
	Importance of shape	1.10**	0.08
	Reaction to prescribed weighing	0.64**	0.09
	Dissatisfaction with weight	1.15**	0.08
	Dissatisfaction with shape	1.11**	0.08
Discomfort seeing body	1.11**	0.08	
Avoidance of exposure	1.15**	0.08	

Note. * $p < .05$, ** $p < 0.01$

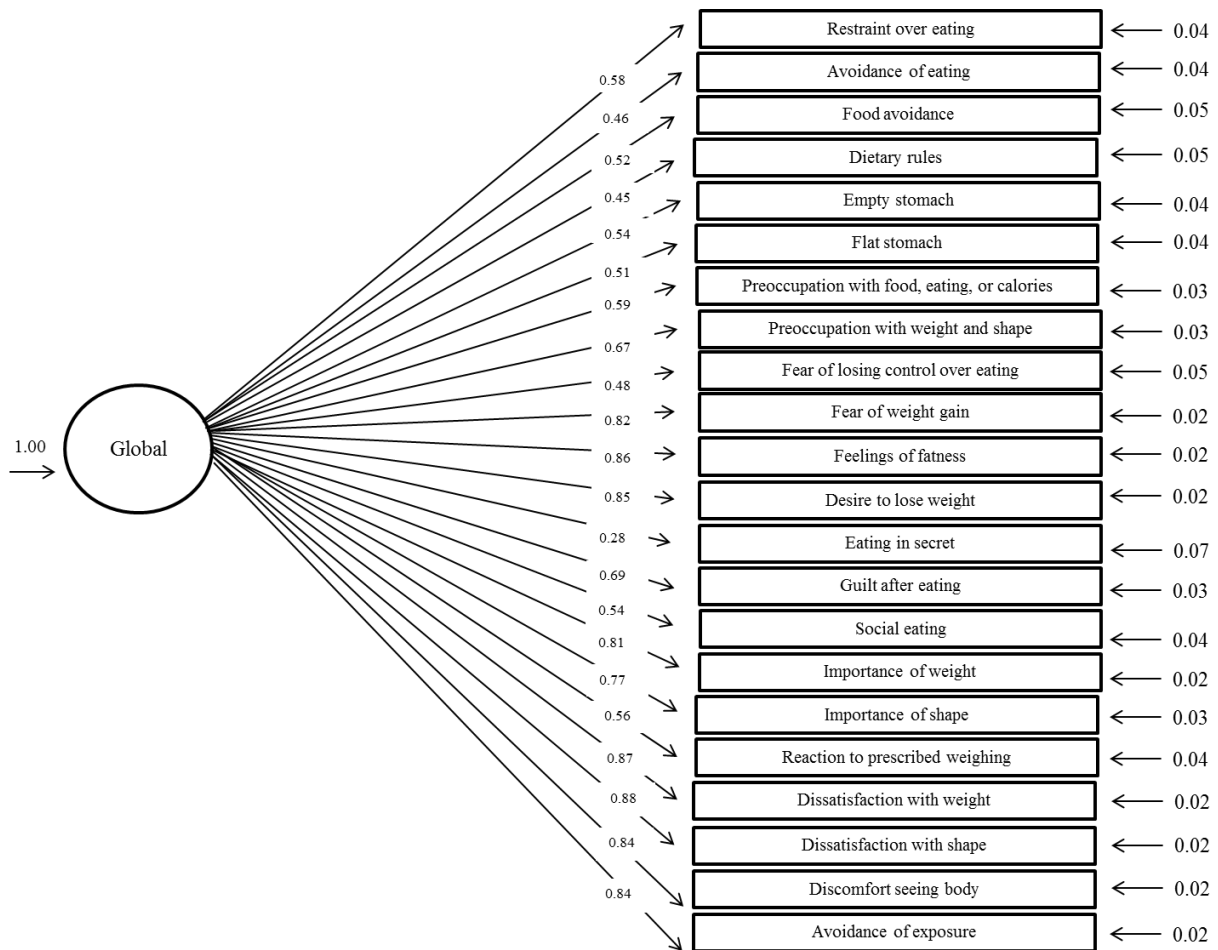


Figure 6. Confirmatory factor analysis (CFA) of a one factor model of the Eating Disorder Examination Questionnaire (EDE-Q) with standardized factor loadings and residuals in Hispanic undergraduate women.

Table 10

Unstandardized estimates and residuals for confirmatory factor analysis (CFA) of a one factor structure of the Eating Disorder Examination Questionnaire (EDE-Q) in Hispanic undergraduate women

<u>Latent Factor</u>	<u>Item</u>	<u>Estimate</u>	<u>Standard Error</u>
Global	Restraint over eating	1.00	0.00
	Avoidance of eating	0.41**	0.05
	Food avoidance	0.89**	0.08
	Dietary rules	0.75**	0.08
	Empty stomach	0.59**	0.07
	Flat stomach	0.97**	0.11
	Preoccupation with food, eating, or calories	0.62**	0.07
	Preoccupation with weight and shape	0.91**	0.10
	Fear of losing control over eating	0.62**	0.09
	Fear of weight gain	1.54**	0.12
	Feelings of fatness	1.51**	0.12
	Desire to lose weight	1.70**	0.13
	Eating in secret	0.17**	0.04
	Guilt after eating	0.93**	0.10
	Social eating	0.60**	0.08
	Importance of weight	1.34**	0.12
	Importance of shape	1.21**	0.12
	Reaction to prescribed weighing	0.80**	0.10
	Dissatisfaction with weight	1.53**	0.13
	Dissatisfaction with shape	1.42**	0.13
Discomfort seeing body	1.39**	0.13	
Avoidance of exposure	1.48**	0.13	

Note. * $p < .05$, ** $p < 0.01$

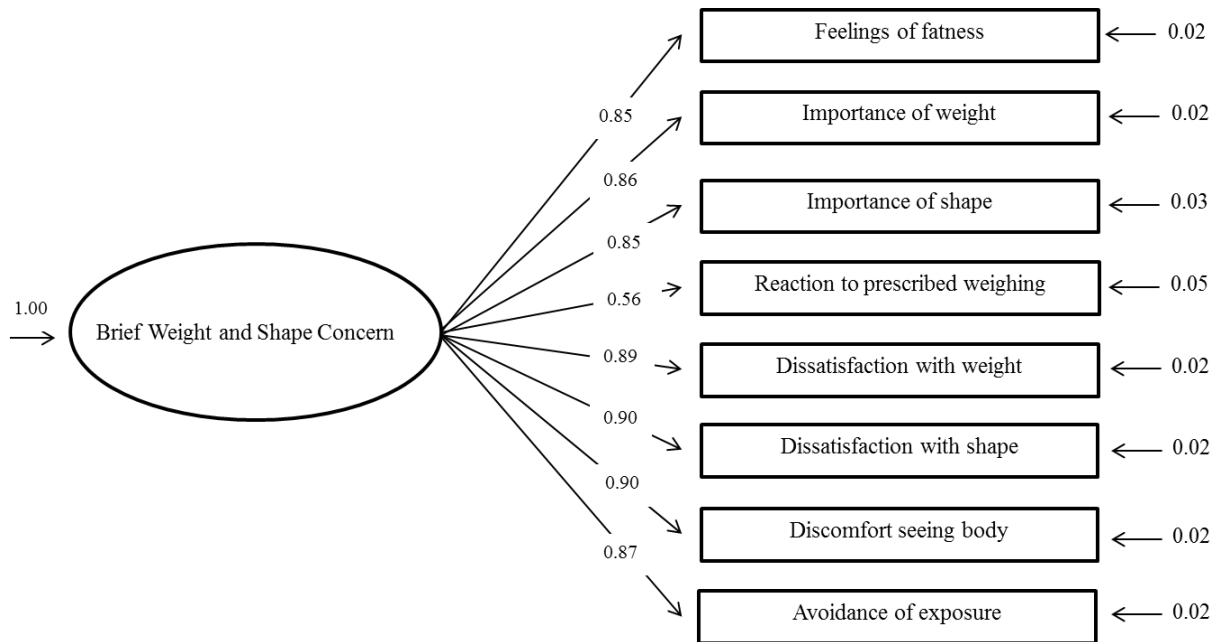


Figure 7. Confirmatory factor analysis (CFA) of a brief one factor model of the Eating Disorder Examination Questionnaire (EDE-Q) with standardized factor loadings and residuals in non-Hispanic undergraduate women.

Table 11

Unstandardized estimates and residuals for confirmatory factor analysis (CFA) of a brief one factor structure of the Eating Disorder Examination Questionnaire (EDE-Q) in non-Hispanic undergraduate women

<u>Latent Factor</u>	<u>Item</u>	<u>Estimate</u>	<u>Standard Error</u>
	Feelings of fatness	1.00	0.00
	Importance of weight	0.95**	0.05
	Importance of shape	0.92**	0.05
Brief Weight and Shape Concern	Reaction to prescribed weighing	0.55**	0.06
	Dissatisfaction with weight	0.99**	0.04
	Dissatisfaction with shape	0.96**	0.04
	Discomfort seeing body	0.97**	0.05
	Avoidance of exposure	0.99**	0.05

Note. * $p < .05$, ** $p < 0.01$

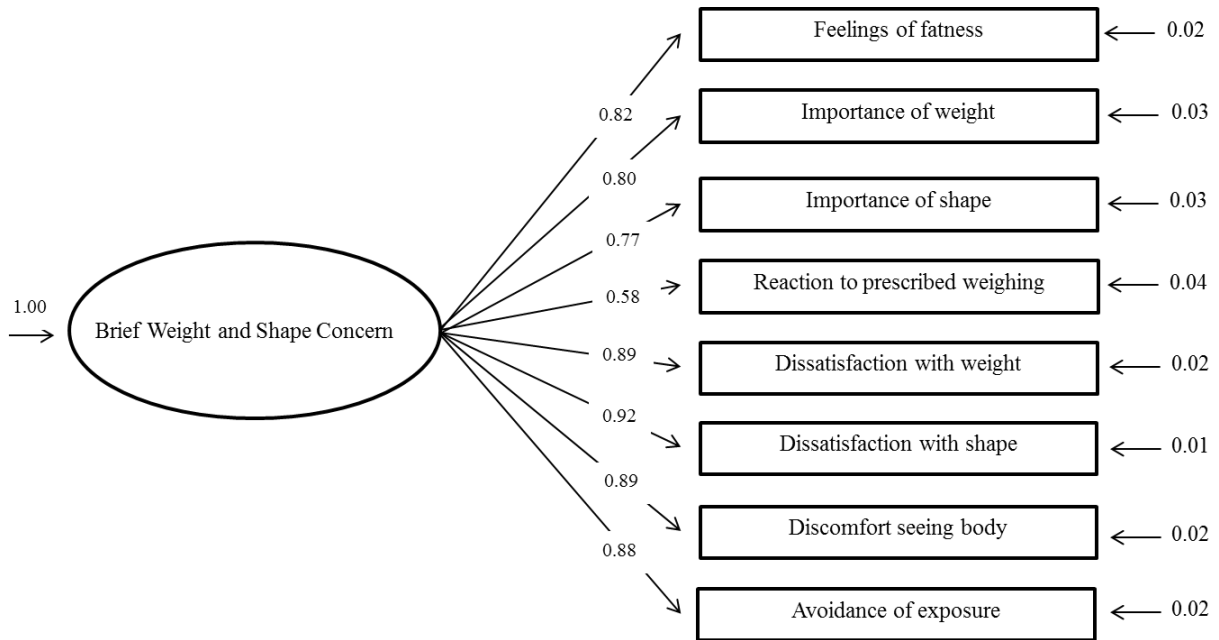


Figure 8. Confirmatory factor analysis (CFA) of a brief one factor model of the Eating Disorder Examination Questionnaire (EDE-Q) with standardized factor loadings and residuals in Hispanic undergraduate women.

Table 12

Unstandardized estimates and residuals for confirmatory factor analysis (CFA) of a brief one factor structure of the Eating Disorder Examination Questionnaire (EDE-Q) in Hispanic undergraduate women

<u>Latent Factor</u>	<u>Item</u>	<u>Estimate</u>	<u>Standard Error</u>
	Feelings of fatness	1.00	0.00
	Importance of weight	0.91**	0.05
	Importance of shape	0.84**	0.05
Brief Weight and Shape Concern	Reaction to prescribed weighing	0.57**	0.06
	Dissatisfaction with weight	1.10**	0.04
	Dissatisfaction with shape	1.03**	0.04
	Discomfort seeing body	1.02**	0.04
	Avoidance of exposure	1.10**	0.04

Note. * $p < .05$, ** $p < 0.01$

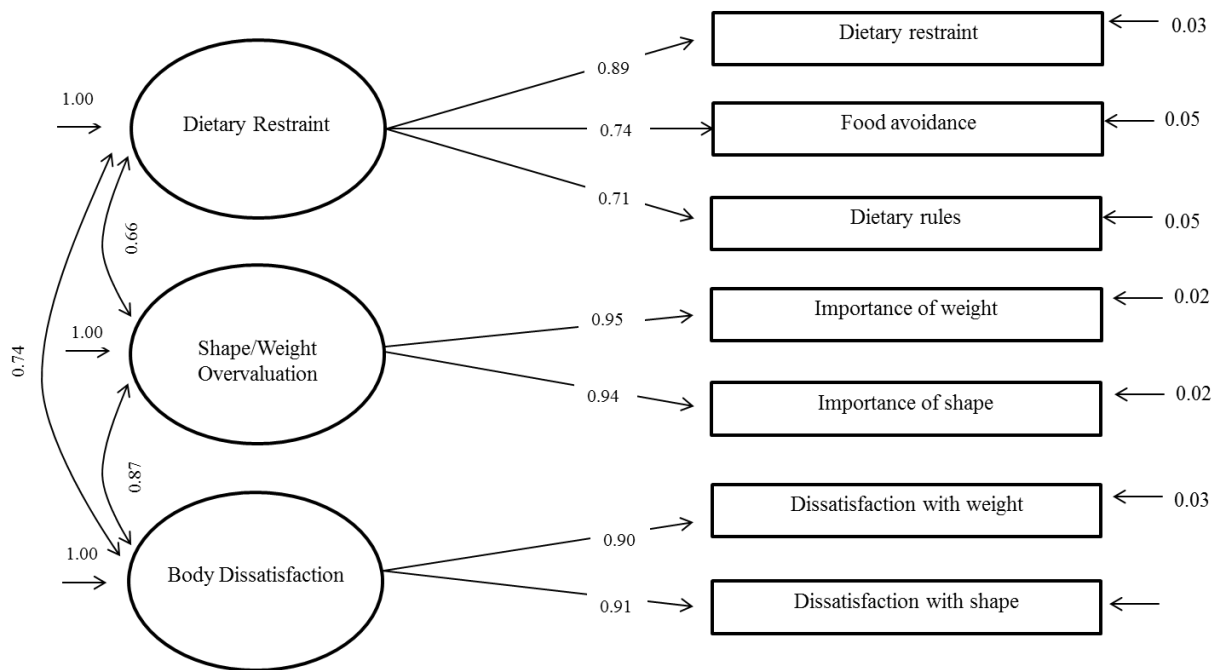


Figure 9. Confirmatory factor analysis (CFA) of a modified three factor model of the Eating Disorder Examination Questionnaire (EDE-Q) with standardized factor loadings and residuals in non-Hispanic undergraduate women.

Table 13

Unstandardized estimates and residuals for confirmatory factor analysis (CFA) of a three factor structure of the Eating Disorder Examination Questionnaire (EDE-Q) in non- Hispanic undergraduate women

<u>Latent Factor</u>	<u>Item</u>	<u>Estimate</u>	<u>Standard Error</u>
Dietary Restraint	Restraint over eating	1.00	0.00
	Food avoidance	0.82**	0.08
	Dietary rules	0.82**	0.08
Shape/Weight Overvaluation	Importance of weight	1.00	0.00
	Importance of shape	0.97**	0.03
Body Dissatisfaction	Dissatisfaction with weight	1.00	0.00
	Dissatisfaction with shape	0.96**	0.05

*Note. * $p < .05$, ** $p < 0.01$*

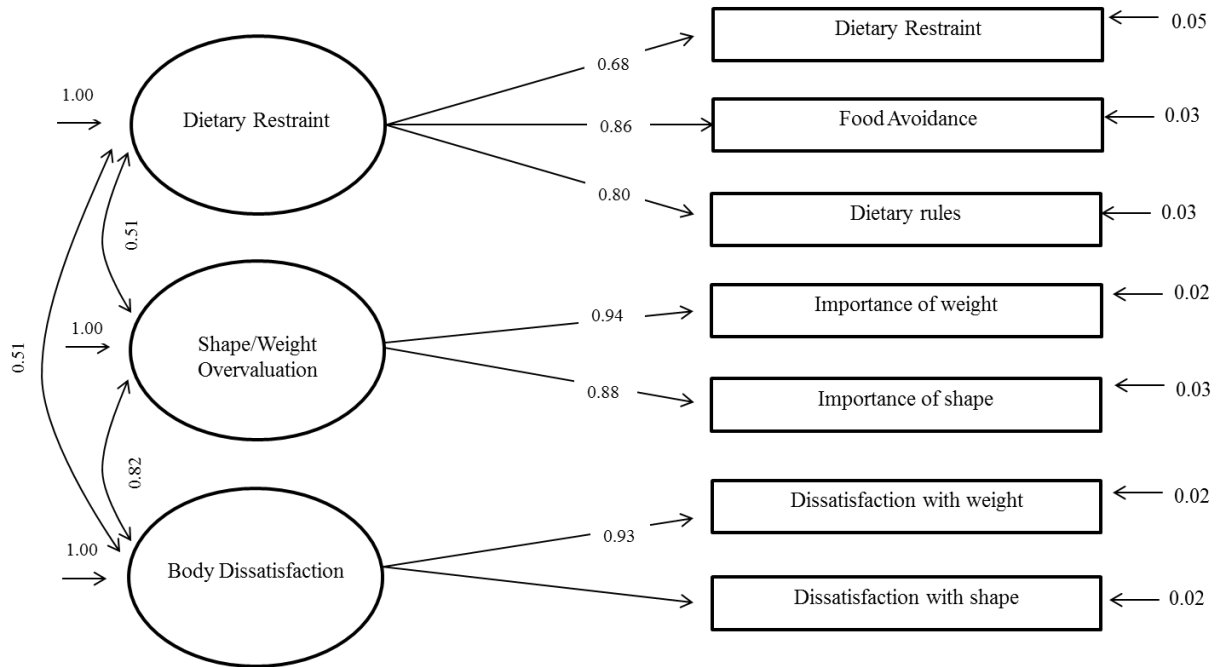


Figure 10. Confirmatory factor analysis (CFA) of a modified three factor model of the Eating Disorder Examination Questionnaire (EDE-Q) with standardized factor loadings and residuals in Hispanic undergraduate women.

Table 14

Unstandardized estimates and residuals for confirmatory factor analysis (CFA) of a three factor structure of the Eating Disorder Examination Questionnaire (EDE-Q) in Hispanic undergraduate women

<u>Latent Factor</u>	<u>Item</u>	<u>Estimate</u>	<u>Standard Error</u>
Dietary Restraint	Restraint over eating	1.00	0.00
	Food avoidance	1.27**	0.14
	Dietary rules	1.14**	0.12
Shape/Weight Overvaluation	Importance of weight	1.00	0.00
	Importance of shape	0.89**	0.04
Body Dissatisfaction	Dissatisfaction with weight	1.00	0.00
	Dissatisfaction with shape	0.88**	0.03

Note. * $p < .05$, ** $p < 0.01$

Table 15

Summary of overall fit of the multiple-group confirmatory factor analysis (CFA) models and comparison of sequential models using χ^2 difference tests

<u>Model</u>	<u>χ^2 (df)</u>	<u>χ^2 difference</u>	<u>CFI</u>	<u>TLI</u>	<u>RMSEA</u>	<u>SRMR</u>
Configural Invariance	78.66(22)	Not applicable	.980	.961	.096	.037
Metric Invariance	95.92(26)	Configural vs Metric: $\chi^2 =$ 17.27, $p = 0.001$.975	.959	.098	.045
Scalar Invariance	99.10(30)	Configural vs Scalar: $\chi^2 = 20.43,$ $p = 0.009$ Metric vs Scalar: $\chi^2 = 3.16, p =$ 0.077	.975	.965	.091	.045

Note. CFI = Comparative Fit Index; TLI = Tucker Lewis Index, RMSEA = Root Mean Square Error of Approximation, SRMR = Standardized Root Mean Square Residual

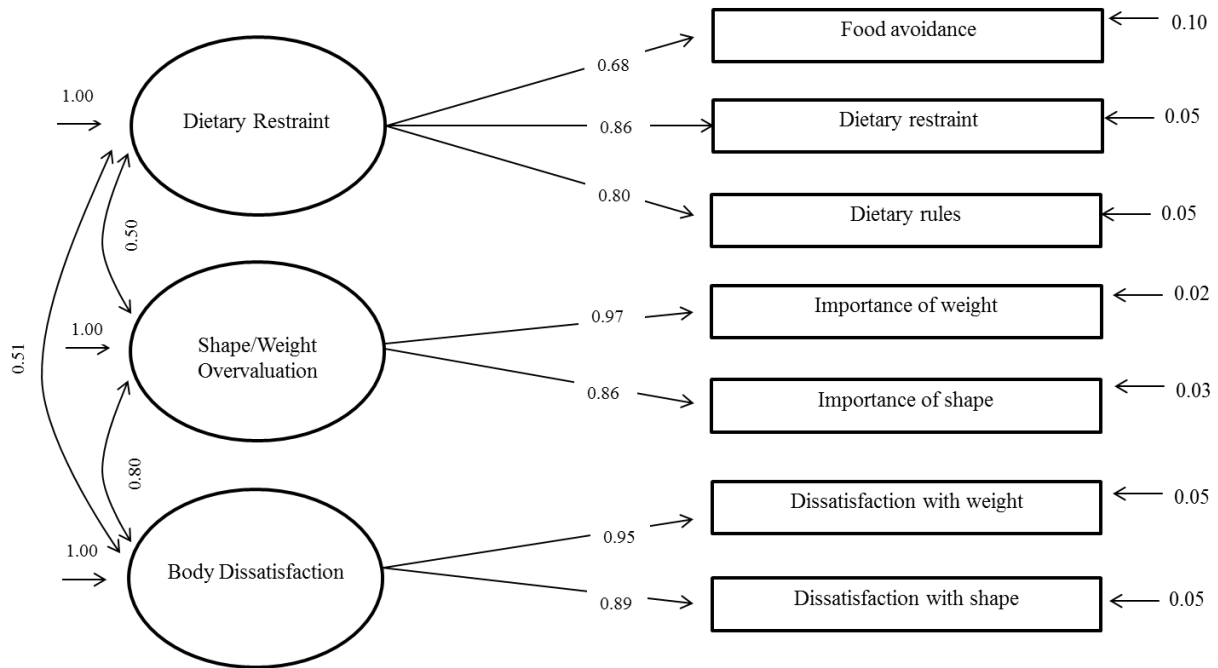


Figure 11. Confirmatory factor analysis (CFA) of a modified three factor model with correlated residuals of the Eating Disorder Examination Questionnaire (EDE-Q) with standardized factor loadings and residuals in Hispanic undergraduate women.

Table 16

Unstandardized estimates and residuals for confirmatory factor analysis (CFA) of a modified three factor structure with correlated residuals of the Eating Disorder Examination Questionnaire (EDE-Q) in Hispanic undergraduate women

<u>Latent Factor</u>	<u>Item</u>	<u>Estimate</u>	<u>Standard Error</u>
Dietary Restraint	Restraint over eating	1.00	0.00
	Food avoidance	1.26**	0.14
	Dietary rules	1.14**	0.12
Shape/Weight Overvaluation	Importance of weight	1.00	0.00
	Importance of shape	0.85**	0.04
Body Dissatisfaction	Dissatisfaction with weight	1.00	0.00
	Dissatisfaction with shape	0.85**	0.03
Correlated Residuals	Importance of shape w/ dissatisfaction with shape	0.32**	0.07

*Note. * $p < .05$, ** $p < 0.01$*

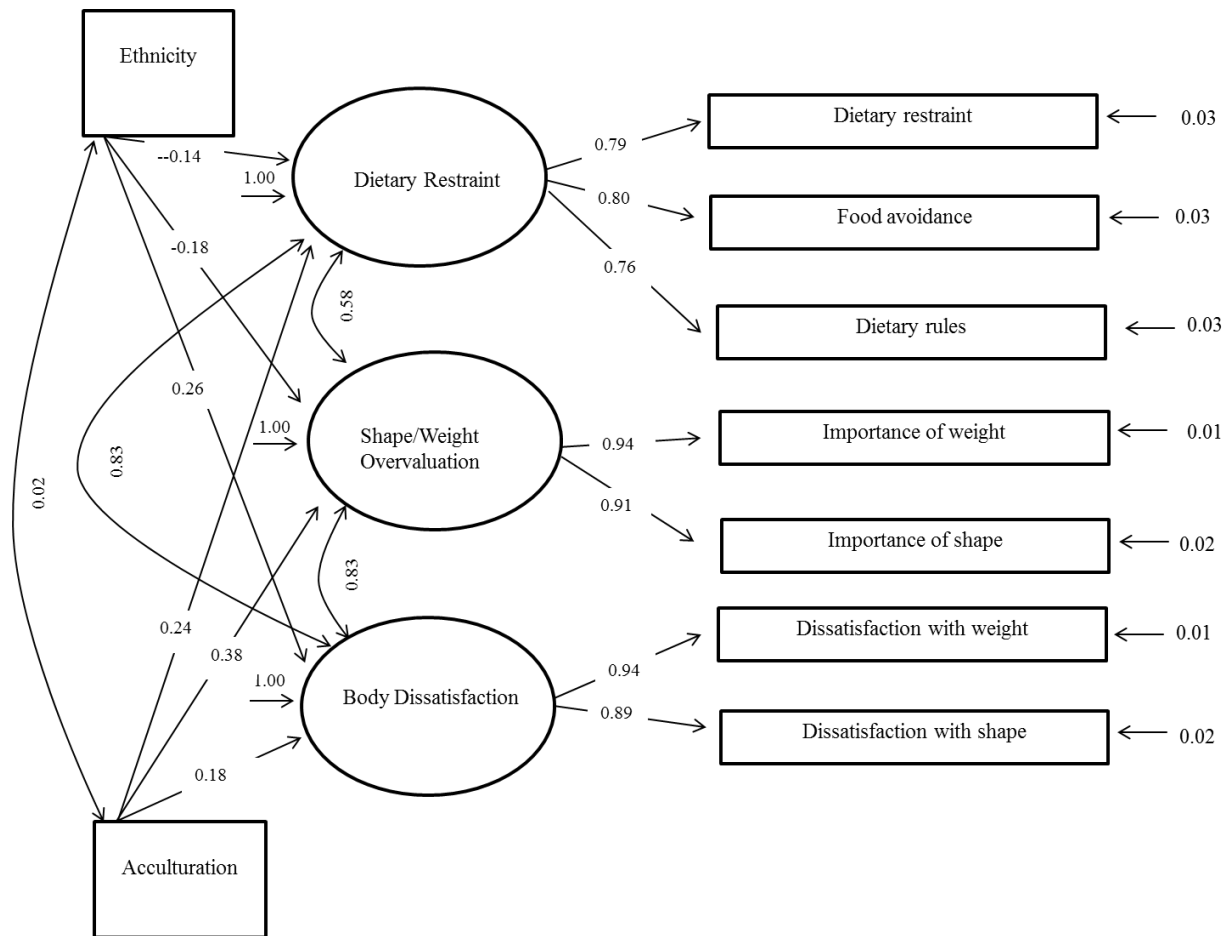


Figure 12. Structural equation model of acculturation and ethnicity as exogenous predictors of a modified three factor model of the Eating Disorder Examination Questionnaire (EDE-Q) with standardized factor loadings and residuals in Hispanic undergraduate women.

Table 17

Unstandardized estimates and residuals for structural equation model (SEM) of acculturation and ethnicity as exogenous predictors on a three factor structure of the Eating Disorder Examination Questionnaire (EDE-Q) in Hispanic undergraduate women

<u>Latent Factor</u>	<u>Item</u>	<u>Estimate</u>	<u>Standard Error</u>
Dietary Restraint	Restraint over eating	1.00	0.00
	Food avoidance	1.01**	0.08
	Dietary rules	0.96**	0.07
Shape/Weight Overvaluation	Importance of weight	1.00	0.00
	Importance of shape	0.93**	0.03
Body Dissatisfaction	Dissatisfaction with weight	1.00	0.00
	Dissatisfaction with shape	0.88**	0.03

Note. * $p < .05$, ** $p < 0.01$

Table 18

Unstandardized estimates and residuals for Structural Equation Model (SEM) of acculturation and ethnicity as exogenous predictors on a three factor structure of the Eating Disorder Examination Questionnaire (EDE-Q) in Hispanic undergraduate women

<u>Exogenous Predictor</u>	<u>Item</u>	<u>Estimate</u>	<u>Standard Error</u>
Ethnicity	Dietary restraint	-0.04*	0.02
	Shape/weight overvaluation	-0.05*	0.02
	Body dissatisfaction	0.06**	0.02
Acculturation	Dietary restraint	0.14**	0.03
	Shape/weight overvaluation	0.20**	0.04
	Body dissatisfaction	0.09*	0.04

Note. * $p < .05$, ** $p < 0.01$

Table 19

Averages, standard deviations, and percentile ranks for EDE-Q global and subscale score in non-Hispanic white undergraduate women.

	<u>Global</u>	<u>Restraint</u>	<u>Eating Concern</u>	<u>Shape Concern</u>	<u>Weight Concern</u>
Mean (SD)	1.78 (1.29)	1.60 (1.36)	0.80 (0.99)	2.55 (1.67)	2.16(1.62)
Percentile Rank					
5	0.06	--	--	0.13	--
10	0.29	--	--	0.40	0.20
15	0.44	--	--	0.66	0.40
20	0.56	0.20	--	1.00	0.60
25	0.66	0.40	--	1.13	0.80
30	0.80	0.60	0.20	1.25	0.92
35	0.98	0.80	0.20	1.50	1.00
40	1.16	1.00	0.20	1.86	1.40
45	1.36	1.20	0.38	2.24	1.60
50	1.56	1.40	0.40	2.38	2.00
55	1.76	1.60	0.60	2.63	2.20
60	1.96	1.80	0.60	3.00	2.60
65	2.22	2.00	0.80	3.25	2.80
70	2.47	2.40	0.80	3.50	3.20
75	2.76	2.40	1.20	3.88	3.40
80	3.02	2.80	1.56	4.38	3.92
85	3.29	3.20	2.00	4.59	4.20
90	3.60	3.40	2.36	5.10	4.60
95	4.11	4.38	3.20	5.38	5.00
99	4.88	5.36	4.00	5.97	5.76

Table 20

Averages, standard deviations, and percentile ranks for EDE-Q global and subscale score in Hispanic undergraduate women.

	<u>Global</u>	<u>Restraint</u>	<u>Eating Concern</u>	<u>Shape Concern</u>	<u>Weight Concern</u>
Mean (SD)	1.76 (1.24)	1.44 (1.33)	0.76 (1.00)	2.67 (1.67)	2.18 (1.64)
Percentile Rank					
5	0.16	--	--	0.25	--
10	0.28	--	--	0.50	0.20
15	0.45	--	--	0.75	0.40
20	0.53	0.20	--	1.00	0.60
25	0.68	0.20	--	1.25	0.75
30	0.81	0.40	--	1.44	1.00
35	0.99	0.60	0.20	1.63	1.20
40	1.15	0.80	0.20	2.00	1.40
45	1.35	0.80	0.20	2.25	1.60
50	1.51	1.00	0.40	2.50	1.80
55	1.79	1.40	0.40	2.75	2.20
60	2.04	1.60	0.60	3.13	2.60
65	2.23	1.80	0.60	3.25	3.00
70	2.44	2.10	0.80	3.63	3.40
75	2.66	2.40	1.20	4.00	3.40
80	2.92	2.60	1.60	4.50	3.80
85	3.18	3.00	1.80	4.72	4.20
90	3.77	3.40	2.20	5.19	4.60
95	4.11	4.00	3.20	5.50	5.00
99	4.74	5.13	4.00	6.00	5.73

Table 21

Percentage of non-Hispanic white undergraduate women endorsing any occurrence and regular occurrence of eating disorder behaviors on the Eating Disorder Examination Questionnaire (EDE-Q)

<u>Behavior</u>	<u>Any Occurrence</u>	<u>Regular Occurrence</u>
Binge eating	35.9%	7.3 %
Self-induced vomiting	4.1 %	0.5 %
Laxative misuse	3.2%	1.8 %
Excessive exercise	45.9 %	5.0 %

Note: Any occurrence is a self-report of any of the above behavior (> 0) over the past 28 days. Regular occurrence for binge eating, self-induced vomiting, and laxative misuse is a report of > 4 instances of a given behavior. Scores greater than 20 for excessive exercise constitute regular occurrence (Luce et al., 2008)

Table 22

Percentage of Hispanic white undergraduate women endorsing any occurrence and regular occurrence of eating disorder behaviors on the Eating Disorder Examination Questionnaire (EDE-Q)

<u>Behavior</u>	<u>Any Occurrence</u>	<u>Regular Occurrence</u>
Binge eating	39.2 %	12.0 %
Self-induced vomiting	3.6 %	0.6 %
Laxative misuse	3.6%	1.8%
Excessive exercise	45.5%	5.4 %

Note: Any occurrence is a self-report of any of the above behavior (> 0) over the past 28 days. Regular occurrence for binge eating, self-induced vomiting, and laxative misuse is a report of > 4 instances of a given behavior. Scores greater than 20 for excessive exercise constitute regular occurrence (Luce et al., 2008)

Appendix A. Institutional Review Board (IRB) Form

Office of the
Institutional Review Board

DATE: October 30, 2015

REFERENCE #: 19215

PROJECT TITLE: [820982-1] Measurement Invariance of the Eating Disorders Examination Questionnaire in a College Sample of Non-Hispanic White and Hispanic Women

PI OF RECORD: Jane Ellen Smith,

PhD SUBMISSION TYPE: New Project

BOARD DECISION: APPROVED

EFFECTIVE DATE: October 30, 2015

EXPIRATION DATE: October 29, 2016

RISK LEVEL: Minimal Risk

REVIEW TYPE: Expedited Review

REVIEW CATEGORY: Expedited review category 5

SUBPART DECISION: *Not Applicable*

PROJECT STATUS: Active - Open to Enrollment

- DOCUMENTS: • Application Form - Project Information Form (UPDATED: 10/29/2015)
- CV/Resume - P.I. CV (UPDATED: 10/23/2015)
 - Other - Project Team (UPDATED: 10/26/2015)
 - Other - Psychology Department Review (UPDATED: 10/26/2015)
 - Protocol - UNM IRB PROTOCOL_Serier 102515.docx (UPDATED: 10/26/2015)
 - Questionnaire/Survey - Demographics Form 2 (UPDATED: 10/26/2015)
 - Questionnaire/Survey - Demographics Form 1 (UPDATED: 10/26/2015)
 - Questionnaire/Survey - Oetting and Beauvais (UPDATED: 10/26/2015)
 - Questionnaire/Survey - Eating Disorders Examination Questionnaire (UPDATED: 10/26/2015)
 - Training/Certification - P.I. CITI Completion Report (UPDATED: 10/23/2015)
 - Training/Certification - Student Investigator CITI Completion Report (UPDATED: 10/26/2015)

Thank you for your submission of New Project materials for this project. The University of New Mexico (UNM) IRB Main Campus has APPROVED your submission. This approval is based on an acceptable risk/benefit ratio and a project design wherein the risks to human participants have been minimized.

This determination applies only to the activities described in the submission and does not apply should any changes be made to this research. If changes are being considered, it is the

responsibility of the Principal Investigator to submit an amendment to this project for IRB review and receive IRB approval prior to implementing the changes. A change in the research may disqualify this research from the current review category.

The IRB has determined the following: Informed consent has been waived.

All reportable events must be promptly reported to the UNM IRB, including: UNANTICIPATED PROBLEMS involving risks to participants or others, SERIOUS adverse events, UNEXPECTED adverse events, NON-COMPLIANCE issues, and COMPLAINTS. All sponsor reporting requirements should also be followed.

The UNM IRB approved the project from October 30, 2015 to October 29, 2016. A continuing review or closure submission is due no later than September 29, 2016. **It is the responsibility of the Principal Investigator to apply for continuing review and receive continuing approval for the duration of this project. If the IRB approval for this project expires, all research related activities must stop and further action will be required by the IRB.**

Please use the appropriate reporting forms and procedures to request amendments, continuing review, closure, and reporting of events for this project. Refer to the OIRB website for forms and guidance on submissions.

Please note that all IRB records must be retained for a minimum of three years after the closure of this project.

The Office of the IRB can be contacted through: mail at MSC02 1665, 1 University of New Mexico, Albuquerque, NM 87131-0001; phone at 505.277.2644; email at irbmaincampus@unm.edu; or in-person at 1805 Sigma Chi Rd. NE, Albuquerque, NM 87106. You can also visit the OIRB website at irb.unm.edu.

Sincerely,



J. Scott Tonigan, PhD
IRB Chair

Appendix B. Consent Form

University of New Mexico

Consent Form

Project Title: Women's Body Images

Project Supervisors: Jane Ellen Smith, Ph.D. (277-2650)
University of New Mexico, Psychology Department,
Albuquerque

Project Coordinators: Kelsey Serier (277-7514) kserier@unm.edu
Liz McLaughlin (277-7514) emcl@unm.edu

Your signature on this form acknowledges that the following points have been explained to you, and that you understand them. If you have any questions, please have them answered before you sign the form. In signing the form you are not in any way committing yourself to completing the project, and you may discontinue at any time without being penalized. All information will be kept strictly confidential and your name will not appear on any of the questionnaires.

I agree that this project has been explained to me and that I understand the following points:

1. I will be participating in a research project conducted through the Psychology Department at the University of New Mexico. The study will ask about my body image, eating and exercise habits, and ethnicity.
2. I will be completing 12 questionnaires and one interview. It will take about 1 ½ hours altogether. I will receive 2 experimental credits for completing the questionnaires and the interview.
3. I understand that the interview about my eating habits will be audiotaped. This is to allow a second experimenter to later listen to the tape to see if she reaches the same conclusion about my eating patterns.
4. I also understand that I will be asked my height and weight. If I do not know my weight, I will be asked to weigh myself (in private) on a scale provided by the researchers.
5. I am not required to participate in this study, but I am doing so voluntarily. I understand that I may choose to discontinue the study at any time without any penalty.

6. My name will never be found on any of the questionnaires that I fill out, nor will it be on the audiotaped interview.
7. I will not receive individual feedback on my responses, but I will receive information about the topic and study in general.
8. I understand that I am not waiving any of my legal rights by signing this form.
9. There are no known physical risks for participation beyond those of normal daily activities. Potential psychological risks include becoming upset upon reading and thinking about the questions. I understand that I will be given referral information for counselors as part of the debriefing.
10. I may contact Dr. Jane Ellen Smith (505-277-2650; janellen@unm.edu) if I have any questions regarding this topic in the future. I may also contact her at: Psychology Department, University of New Mexico, MSC03 2220, Albuquerque, NM 87131. I may also contact the University of New Mexico Main Campus Institutional Review Board: IRBMainCampus@unm.edu; (505) 277-2644.

CONSENT

Name of Participant (print)

Signature of Participant

Date

Name of Investigator (print)

Signature of Participant

Date

Appendix C. Demographic Questionnaire

Demographic Questionnaire

1. What is your age? _____
2. What is your marital status? (*Please circle one*)
 - a. Married & living with husband
 - b. Married but not living with husband
 - c. Never married
 - d. Divorced
 - e. Separated
 - f. Widowed
3. How would you describe your ethnic identity?

If you are Native American, to what tribe do you belong? _____
4. What is your occupation?

(If you are a full-time or part-time student, please indicate this in addition to mentioning employment)
5. What is your highest level of education? (*Please circle one*)
 - a. Completed junior year in high school (11th grade)
 - b. Graduated from high school (12th grade) or GED
 - c. Completed at least 1 year of college (but did not receive a degree)
 - d. Completed an associate's degree or equivalent (2 years of college)
 - e. Completed 3 years of college
 - f. Completed a bachelor's degree (4 year college)
 - g. Completed some graduate school (but did not receive a degree)
 - h. Completed a masters degree
 - i. Other (please specify)

6. If you have a husband or a Significant Other, what is that person's occupation?

7. If you have a husband or a Significant Other, how long have you been with this person?
_____ years and/or _____ months
8. If you have a husband/Significant Other, what is their highest level of education (*circle one*):
 - a. Completed less than junior high school (*less than 7th grade*)
 - b. Completed 7th grade
 - c. Completed junior high school (8th grade)
 - d. Completed freshman year (9th grade)
 - e. Completed sophomore year (10th grade)
 - f. Completed junior year (11th grade)
 - g. Graduated from high school (12th grade) or GED
 - h. Completed at least 1 year of college (but did not receive a degree)
 - i. Completed an associate's degree or equivalent (2 years of college)
 - j. Completed a bachelor's degree (4 year college)
 - k. Completed some graduate school (but did not receive a degree)
 - l. Completed a masters degree
 - m. Other (please specify)

8. How tall are you? _____
9. Approximately how much do you weigh?

(If you do not know, we have a scale you can use in private)
10. Have you ever been diagnosed with an eating disorder? (*circle*) Yes No
11. Have you ever received treatment for an eating disorder? (*circle*) Yes No

If YES: please indicate the type of eating disorder:
_____,
as well as when _____

and where you were treated

12. Do you think you are overweight? (*circle*)
Yes No

If YES: how many pounds do you think you
should lose? _____

13. Do you think you are underweight? (*circle*)
Yes No

If YES: how many pounds do you think you
should gain? _____

Appendix D. Revised Demographic Questionnaire

Women's Body Images

Demographic Questionnaire

1. What is your age? _____
 indicate this in addition to mentioning employment)

2. What is your marital status? (*Please circle one*)
 - a. Married & living with husband
 - b. Married but not living with husband
 - c. Never married
 - d. Divorced
 - e. Separated
 - f. Widowed

3. Ethnicity and race (in accordance with the categories used in the U.S. Census):

(A) Ethnicity: Are you Hispanic, Latino, or Spanish origin?

_____ (a) No, not of Hispanic, Latino, or Spanish origin

_____ (b) Yes, Mexican, Mexican American, or Chicano

_____ (c) Yes, Puerto Rican

_____ (d) Yes, Cuban

_____ (e) Yes, another Hispanic, Latino, or Spanish origin

_____ (f) Unavailable/Unknown

(B) Race: Which category best describes your race?

_____ (a) American Indian/Alaska Native
 (Indicate tribe: _____)

_____ (b) Asian

_____ (c) Black or African American

_____ (d) Native Hawaiian/Other Pacific Islander

_____ (e) White

_____ (f) Some other race (Please indicate: _____)

_____ (g) Unavailable/Unknown

(C) Using your *own* terms, how would you describe your ethnic/racial identity:

4. What is your occupation?

5. What is your highest level of education? (*Please circle one*)
 - a. Completed junior year in high school (11th grade)
 - b. Graduated from high school (12th grade) or GED
 - c. Completed at least 1 year of college (but did not receive a degree)
 - d. Completed an associate's degree or equivalent (2 years of college)
 - e. Completed 3 years of college
 - f. Completed a bachelor's degree (4 year college)
 - g. Completed some graduate school (but did not receive a degree)
 - h. Completed a masters degree
 - i. Other (please specify)

6. If you have a husband or a Significant Other, what is that person's occupation?

7. If you have a husband or a Significant Other, how long have you been with this person?
 _____ years and/or _____ months

8. If you have a husband/Significant Other, what is their highest level of education (*circle one*):
 - a. Completed less than junior high school (*less than 7th grade*)
 - b. Completed 7th grade
 - c. Completed junior high school (8th grade)
 - d. Completed freshman year (9th grade)
 - e. Completed sophomore year (10th grade)
 - f. Completed junior year (11th grade)
 - g. Graduated from high school (12th grade) or GED
 - h. Completed at least 1 year of college (but did not receive a degree)

(If you are a full-time or part-time student, please

- i. Completed an associate's degree or equivalent (2 years of college)
 - j. Completed a bachelor's degree (4 year college)
 - k. Completed some graduate school (but did not receive a degree)
 - l. Completed a masters degree
 - m. Other (please specify)
-

—

****CONTINUE TO PAGE 2****
THERE ARE SEVERAL MORE QUESTIONS
FOR
THIS QUESTIONNAIRE

9. How tall are you? _____

10. Approximately how much do you weigh?

(If you do not know, we have a scale you can use
 in private)

11. Have you ever been diagnosed with an eating disorder? (*circle*) Yes No

12. Have you ever received treatment for an eating disorder? (*circle*) Yes No

If YES: please indicate the type of eating disorder:

____,

as well as when you were treated

and where you were treated

13. Do you think you are overweight? (*circle*)
 Yes No

If YES: how many pounds do you think you should lose? _____

14. Do you think you are underweight? (*circle*)
 Yes No

If YES: how many pounds do you think you should gain? _____

\

Appendix E. Eating Disorder Examination Questionnaire (EDE-Q)

EATING QUESTIONNAIRE

Instructions: The following questions are concerned with the past four weeks (28 days) only. Please read each question carefully. Please answer all the questions. Thank you.

Questions 1 to 12: Please circle the appropriate number on the right. Remember that the questions only refer to the past four weeks (28 days) only.

On how many of the past 28 days	No days	1-5 days	6-12 days	13-15 days	16-22 days	23-27 days	Every day
1 Have you been deliberately <u>trying</u> to limit the amount of food you eat to influence your shape or weight (whether or not you have succeeded)?	0	1	2	3	4	5	6
2 Have you gone for long periods of time (8 waking hours or more) without eating anything at all in order to influence your shape or weight?	0	1	2	3	4	5	6
3 Have you <u>tried</u> to exclude from your diet any foods that you like in order to influence your shape or weight (whether or not you have succeeded)?	0	1	2	3	4	5	6
4 Have you <u>tried</u> to follow definite rules regarding your eating (for example, a calorie limit) in order to influence your shape or weight (whether or not you have succeeded)?	0	1	2	3	4	5	6
5 Have you had a definite desire to have an <u>empty</u> stomach with the aim of influencing your shape or weight?	0	1	2	3	4	5	6
6 Have you had a definite desire to have a <u>totally flat</u> stomach?	0	1	2	3	4	5	6
7 Has thinking about <u>food, eating or calories</u> made it very difficult to concentrate on things you are interested in (for example, working, following a conversation, or reading)?	0	1	2	3	4	5	6
8 Has thinking about <u>shape or weight</u> made it very difficult to concentrate on things you are interested in (for example, working, following a conversation, or reading)?	0	1	2	3	4	5	6
9 Have you had a definite fear of losing control over eating?	0	1	2	3	4	5	6
10 Have you had a definite fear that you might gain weight?	0	1	2	3	4	5	6
11 Have you felt fat?	0	1	2	3	4	5	6
12 Have you had a strong desire to lose weight?	0	1	2	3	4	5	6

Questions 13-18: Please fill in the appropriate number in the boxes on the right. Remember that the questions only refer to the past four weeks (28 days).

Over the past four weeks (28 days)

- 13 Over the past 28 days, how many times have you eaten what other people would regard as an unusually large amount of food (given the circumstances)?
.....

- 14 On how many of these times did you have a sense of having lost control over your eating (at the time that you were eating)?
.....

- 15 Over the past 28 days, on how many **DAYS** have such episodes of overeating occurred (i.e., you have eaten an unusually large amount of food and have had a sense of loss of control at the time)?
.....

- 16 Over the past 28 days, how many times have you made yourself sick (vomit) as a means of controlling your shape or weight?
.....

- 17 Over the past 28 days, how many times have you taken laxatives as a means of controlling your shape or weight?
.....

- 18 Over the past 28 days, how many times have you exercised in a “driven” or “compulsive” way as a means of controlling your weight, shape or amount of fat, or to burn off calories?
.....

Questions 19 to 21: Please circle the appropriate number. Please note that for these questions the term “binge eating” means eating what others would regard as an unusually large amount of food for the circumstances, accompanied by a sense of having lost control over eating.

19 Over the past 28 days, on how many days have you eaten in secret (ie. furtively)? Do not count episodes of binge eating	No days	1-5 days	6-12 days	13-15 days	16-22 days	23-27 days	Every day
	0	1	2	3	4	5	6
20 On what proportion of the times that you have eaten have you felt guilty (felt that you've done wrong) because of its effect on your shape or weight? Do not count episodes of binge eating	None of the times	A few of the times	Less than half	Half of the times	More than half	Most of the time	Every time
	0	1	2	3	4	5	6
21 Over the past 28 days, how concerned have you been about other people seeing you eat? Do not count episodes of binge eating	Not at all	Slightly	Moderately	Markedly			
	0	1	2	3	4	5	6



Questions 22 to 28: Please circle the appropriate number on the right. Remember that the questions only refer to the past four weeks (28 days).

Over the past 28 days	Not at all		Slightly		Moderate-ly		Markedly
22 Has your <u>weight</u> influenced how you think about (judge) yourself as a person?	0	1	2	3	4	5	6
23 Has your <u>shape</u> influenced how you think about (judge) yourself as a person?	0	1	2	3	4	5	6
24 How much would it have upset you if you had been asked to weigh yourself once a week (no more, or less, often) for the next four weeks?	0	1	2	3	4	5	6
25 How dissatisfied have you been with your <u>weight</u> ?	0	1	2	3	4	5	6
26 How dissatisfied have you been with your <u>shape</u> ?	0	1	2	3	4	5	6
27 How uncomfortable have you felt seeing your body (for example, seeing your shape in the mirror, in a shop window reflection, while undressing or taking a bath or shower)?	0	1	2	3	4	5	6
28 How uncomfortable have you felt about <u>others</u> seeing your shape or figure (for example, in communal changing rooms, when swimming, or wearing tight clothes)?	0	1	2	3	4	5	6

What is your weight at present? (Please give your best estimate.)

What is your height? (Please give your best estimate.)

If female: Over the past three-to-four months have you missed any menstrual periods?

If so, how many?

Have you been taking the "pill"?

THANK YOU

Appendix F. Orthogonal Cultural Identification Scale (OCIS)

Please answer the following questions which ask how close you are to different cultures. Please complete A – D for each question, and complete E as appropriate.

1. Some families have special activities or traditions that take place every year at particular times (such as holiday parties, special meals, religious activities, trips, or visits). How many of these special activities or traditions did your family have when you were growing up that were based on...				
	lot	ome	few	one at all
A. White-American or Anglo culture				
B. Mexican-American or Spanish culture				
C. American-Indian culture				
D. Black-American culture				
E. Other culture. Please specify: _____				
2. In your own family, do you do special things together or have special traditions that are based on...				
	lot	ome	few	one at all
A. Mexican-American or Spanish culture				
B. American-Indian culture				
C. Black-American culture				
D. White-American or Anglo culture				
E. Other culture. Please specify: _____				
3. Does your family live by or follow...				
	lot	ome	few	one at all
A. The American-Indian way of life				
B. The Black-American way of life				
C. The White-American or Anglo way of life				
D. The Mexican-American or Spanish way of life				
E. The _____ way of life. (Please specify)				
4. Do <u>you</u> live or follow...				
	lot	ome	few	one at all
A. The Black-American way of life				
B. The White-American or Anglo way of life				

C. The Mexican-American or Spanish way of life				
D. The American-Indian way of life				
E. The _____ way of life. (Please specify)				

5. Is your family a success...				
	lot	ome	few	one at all
A. In the Black-American way of life				
B. In the Mexican-American or Spanish way of life				
C. In the White-American or Anglo way of life				
D. In the American-Indian way of life				
E. In the _____ way of life. (Please specify)				
6. Are <u>you</u> a success...				
	lot	ome	few	one at all
A. In the American-Indian way of life				
B. In the White-American or Anglo way of life				
C. In the Black-American way of life				
D. In the Mexican-American or Spanish way of life				
E. Other culture. Please specify: _____				

References

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