Exploring a Model and Moderators of Disordered Eating With Asian American College Women

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In the present study, the authors tested the cross-ethnic validity of several variables and paths from a model of disordered eating proposed by T. L. Tylka and L. M. Subich (2004) with 200 Asian American college women. Path analysis indicated that this model provided an excellent fit to the data after a path from internalization of the thin ideal to disordered eating was added. Ethnic identity subsequently was added to this model and was found to influence disordered eating only indirectly through its association with self-esteem. Additionally, when examined as moderators via hierarchical moderated regression, self-esteem buffered the pressure for thinness–body preoccupation relation, whereas ethnic identity intensified this relation. Neither self-esteem nor ethnic identity moderated the pressure for thinness–disordered eating relation.

Keywords: Asian American women, eating disorders, body preoccupation, ethnic identity, self-esteem

The study of disordered eating and its correlates is an integral area for counseling psychologists, as they are likely to encounter clients with bona-fide clinical eating disorders at some point in their careers and clients with subclinical eating disturbances and body image disturbances on a regular basis (Kalodner, 1998). Given the above, counseling psychologists have pinpointed gaps within the eating disorder (ED) literature that need to be addressed, such as a) identifying how variables combine to predict body image and disordered eating among women of color and b) identifying protective variables that buffer the relations between environmental stress, body image, and disordered eating (Root, 2001; Striegel-Moore & Cachelin, 1999, 2001; Tylka, 2004).

Historically, research on body image and ED symptomatology has been based most often on the experiences of young Caucasian women and has neglected other individuals (Striegel-Moore & Smolak, 2000). Ethnocentrism, stereotypes, racism, and beliefs that nonwestern cultural characteristics (e.g., low pressure for thinness, appreciation of larger body sizes) render women of color invulnerable to body image and eating concerns are potential reasons why these women have not been included in this literature (Root, 1990). However, most women living in the United States are influenced by the thin-ideal standard, even when their ethnic identification is different from this culture (Root, 2001). It is imperative, then, that body image and ED symptomatology are also investigated among women of color.

In recent years, attention to ED symptomatology among women of color has grown steadily in the theoretical and empirical literature. Overall, researchers often have debunked perceptions that body image and disordered eating are concerns exclusive to Caucasian women. For instance, Cachelin, Veisel, Barzegarnazari, and Striegel-Moore (2000) found that Hispanic American, Asian American, African American, and Caucasian community-dwelling women were equally likely to present behavioral symptoms of bulimia, anorexia, and binge eating disorder. Studies that uncovered ethnic group differences in body dissatisfaction and disordered eating (e.g., Cashel, Cunningham, Landeros, Cokley, & Muhammad, 2003; Wildes, Emery, & Simons, 2001) typically had small effect sizes and did not examine whether body mass index accounted for these differences.

Although several researchers (e.g., Barry & Garner, 2001; Humphry & Ricciardelli, 2004; Iyer & Haslam, 2003; Petrie, Tripp, & Harvey, 2002; Sanders & Heiss, 1998; G. Tsai, Curbow, & Heinberg, 2003) have conducted research on EDs among Asian American women, there are considerably fewer studies to date that have explored Asian American women’s body image disturbance and disordered eating in comparison to those conducted with Caucasian women (Mintz & Kashubeck, 1999). Possible reasons for this lack of research include stereotypes that Asian American women are the “model minority” that do not experience psychological problems and that their smaller body size protects them from body dissatisfaction (Kawamura, 2002, p. 248). Hall (1995) argued that it is necessary to conduct such research with Asian women living in the United States, as they may experience lower self-esteem, poorer body image, and higher ED symptomatology than Caucasian women because they deviate from Caucasian ideals of beauty.

Scholars unfortunately have not yet tested theoretical models demonstrating how several variables combine to predict ED symptomatology among Asian American women. When examining...
correlates and predictors of ED symptomatology, conducting tests of multiple predictor models is essential, as these analyses could discern variables that continue to predict unique criterion variance from those that no longer predict unique criterion variance because of their conceptual overlap with other variables (Mazzeo & Espelage, 2002). Although structural models of ED symptomatology have been proposed (e.g., Stice, Nemeroff, & Shaw, 1996; Tylka & Subich, 2004), these models have been tested with samples of predominantly Caucasian women. According to Kawamura (2002), there is a strong need for testing theoretical models of ED symptomatology with Asian American women. Therefore, the primary purpose of our study was to examine whether many variables and paths included within one empirically supported model of ED symptomatology (i.e., Tylka & Subich’s [2004] model) were supported among a sample of Asian American women.

We chose to examine the Tylka and Subich (2004) model rather than other models of ED symptomatology, as it contains several personal, sociocultural, and relational variables shown to be strong predictors of disordered eating that are not included as a set within other models. Moreover, Tylka and Subich’s model integrates many extant theoretical speculations about the variables, as well as the direction of the variable paths, thought to be relevant to Asian American women’s ED symptomatology. This model asserts that women who perceive sociocultural pressures to become thinner are more likely to experience low self-esteem, the tendency to internalize the thin image as the ideal body type, and body image disturbance. Having low self-esteem further encourages women to look outside of themselves for direction as to how to appear (i.e., ED symptomatology). A more detailed discussion of the variables and paths within Tylka and Subich’s (2004) model, as well as support for the specification of these variables and paths among Asian American women, is presented next.

Women often are pressured to become thinner indirectly from the unrealistically thin prototype of a woman’s body presented in the media and directly from family, friends, and partners who encourage women to become slimmer to appear more consistent with this prototype (Stice, 1994). Scholars (e.g., Stice, Nemeroff, & Shaw, 1996) have speculated as to how pressure for thinness could lead to ED symptomatology and have asserted that the amount of pressure predicts the extent to which women internalize the belief that the ideal body shape for women is thin. That is, women who are surrounded by greater pressures to lose weight from significant others and the media are believed to be more likely to internalize a thin body as the ideal shape for all women. Indeed, within Tylka and Subich’s (2004) model, perceived pressure for thinness predicted unique variance in internalization of the thin ideal. Root (1990, 2001) insisted that women of color living in Western cultures very likely experience pressure for thinness that could lead them to internalize thinness as the ideal body type for all women. On the basis of Root’s hypothesis, it seems likely that pressure for thinness would be a predictor of internalization of the thin ideal among Asian American women. Thus, in the model examined in the present study (see Figure 1), a path (Path a) was specified from perceived pressure for thinness to internalization of the thin ideal.

Furthermore, scholars (e.g., Fredrickson & Roberts, 1997; Stice, 1994) have asserted that pressure for thinness leads women to directly experience shame toward their bodies and lower self-esteem because these pressures encourage women to conclude that their self in general and appearance in particular are unsatisfactory; Tylka and Subich’s (2004) model supports these paths empirically.

Rosenberg Self-Esteem Scale; SATAQ–I = Internalization subscale of the Sociocultural Attitudes Toward Appearance Questionnaire; BSQ–R-10 = Body Shape Questionnaire—Revised–10; EAT-26 = Eating Attitudes Test–26.

Figure 1. Proposed structural model of Asian American women’s eating disorder symptomatology based on associations specified in the Tylka and Subich (2004) model (i.e., Model 1). PSPS = Perceived Sociocultural Pressure Scale; RSES = Rosenberg Self-Esteem Scale; SATAQ–I = Internalization subscale of the Sociocultural Attitudes Toward Appearance Questionnaire; BSQ–R-10 = Body Shape Questionnaire—Revised–10; EAT-26 = Eating Attitudes Test–26.
as they may feel that their weight reflects badly on their families and community. As a result of these theoretical assertions, we specified paths from perceived pressure for thinness to body preoccupation (Path b) and self-esteem (Path c) within our model (see Figure 1).

According to Striegel-Moore and Cachelin (1999), women with low self-esteem are more likely to self-objectify because their low sense of self-worth makes them more vulnerable to internalizing society’s thin-ideal image and generalizing their negative feelings about themselves to their bodies. These predictions were supported empirically in Tylka and Subich’s (2004) model. For Asian American women, A. S. Pan (2000) and Yoshimura (1995) found that self-esteem was related to internalization of the thin ideal and body dissatisfaction. On the basis of this theory and research, we expected self-esteem to predict internalization of the thin ideal (Path d) and body preoccupation (Path e) within our model (see Figure 1).

Furthermore, women who internalize the thin ideal are believed to frequently compare their bodies with societal ideals impossible for most women to attain, and they are left feeling negatively toward their bodies (Fredrickson & Roberts, 1997; Stice, 1994). Within Tylka and Subich’s (2004) model, empirical support was found for this path. C. Tsai, Hoerr, and Song (1998) hypothesized that Asian American women’s endorsement of the thin ideal would predict their body dissatisfaction; indeed, these researchers found support for this association. Thus, we specified a path (see Path f in Figure 1) from internalization of the thin ideal to body preoccupation within our model.

Women who are dissatisfied with their bodies are more likely to engage in unhealthy weight control strategies in an attempt to change their body shape; poor body image was found to directly predict ED symptomatology within Tylka and Subich’s (2004) model. Similarly, theorists (e.g., Mok, 1998a; Root, 1990, 2001; Striegel-Moore & Cachelin, 1999) have argued that body dissatisfaction is likely to predict ED symptomatology among Asian American women and other women of color, as they also are likely to use harmful weight control strategies to attempt to alter their body shape and size. Indeed, body image disturbance has been found to predict ED symptomatology among Asian American women (Humphry & Ricciardelli, 2004; G. Tsai et al., 2003) and Asian American girls (Neumark-Sztainer et al., 2002). Consequently, we included a path (see Path g in Figure 1) from body preoccupation to ED symptomatology within our model.

We tested a second model (see Figure 2) that included all variables and paths as the previously described model but also incorporated ethnic identity. According to Root (2001), it is imperative that researchers attend to how ethnic identity predicts disordered eating among women of color. Phinney (1989) stated that salient aspects of ethnic identity (e.g., expressing positive ethnic attitudes; identification, affirmation, and belonging with an ethnic group) play an important role in the self-esteem of ethnic minorities in the United States, particularly when they are confronted with environmental stress. It has been well documented that ethnic identity predicts higher self-esteem among Asian American women (Hall, 1995; Lee, 2003). Therefore, we hypothesized that ethnic identity would predict higher self-esteem within this second model (see Path h). We also asserted that ethnic identity would predict internalization of the thin ideal in this model (see Path i), as theorists (e.g., Striegel-Moore, Silberstein, & Rodin, 1986) have suggested that strong ethnic identification with a culture that values thinness to a lesser extent than Western culture would decrease women’s likelihood of internalizing Western ideals of thinness and beauty. It has been argued that Asian culture may encourage women to focus more on other physical characteristics (e.g., lighter skin color, breast size) than on weight (Altabe, 1998). Higher levels of ethnic identification with a culture that deemphasizes thinness have been proposed to predict greater body satisfaction (e.g., Striegel-Moore & Cachelin, 1999) and lower levels of eating disturbance (e.g., Harris & Kuba, 1997; Kempa & Thomas, 2000; Nasser, 1998; Root, 1990) among women living in the United States. In fact, G. Tsai et al. (2003)

![Figure 2. Proposed structural model of Asian American women’s eating disorder symptomatology based on associations specified in the Tylka and Subich (2004) model and the ethnic identity literature (i.e., Model 2). PSPS = Perceived Sociocultural Pressure Scale; RSES = Rosenberg Self-Esteem Scale; MEIM = Multi-Group Ethnic Identity Measure; SATAQ–I = Internalization subscale of the Sociocultural Attitudes Toward Appearance Questionnaire; BSQ–R-10 = Body Shape Questionnaire—Revised–10; EAT-26 = Eating Attitudes Test–26.](image-url)
found that ethnic identity negatively predicted body image disturbance and ED symptomatology among Asian American women. We therefore included paths from ethnic identity to both body preoccupation (see Path j) and ED symptomatology (see Path k) in this second model. However, these latter two paths were more exploratory in nature because contradictory findings have been obtained as to whether ethnic identity is related to body preoccupation and disordered eating (Iyer & Haslam, 2003; G. Tsai et al., 2003).

In addition to investigating whether models of ED symptomatology demonstrate validity evidence with women of color, several renowned experts in EDs (i.e., Root, 2001; Striegel-Moore & Cachelin, 2001) have suggested that research should be aimed at identifying factors that protect women from experiencing body image disturbance and disordered eating. Despite this call, no study has explored whether high levels of certain variables such as ethnic identity and self-esteem moderate or protect Asian American women faced with high levels of pressure for thinness from body preoccupation and ED symptomatology.

This lack of research is surprising, given that several scholars have proposed that these variables may protect women from experiencing body image disturbance and disordered eating. For instance, Croll, Neumark-Sztainer, Story, and Ireland (2002); Kempa and Thomas (2000); Root (1990); and Striegel-Moore and Cachelin (1999) asserted that a strong ethnic identity could protect women of color from allowing Western cultural pressures for thinness to influence their body image and eating habits. Thus, it is reasonable to argue that a strong identification with a culture that does not equate self-value with thinness could help women resist Western cultural pressures for thinness from affecting their body image and eating habits.

Women with high levels of self-esteem also are thought to be less susceptible to body image and eating disturbances, as they hold positive attitudes about their worth and are less likely to allow pressures for thinness to dictate how they feel about their bodies and affect their eating behaviors (Striegel-Moore & Cachelin, 1999; Twamley & Davis, 1999). Among predominantly Caucasian women, a high level of self-esteem buffered the relation between a perceived oppressive environment and psychological distress (Moradi & Subich, 2004). We wanted to determine whether Asian American women with high self-esteem are more able to fall back on a positive sense of self when confronted with sociocultural pressures for thinness and thus maintain a more positive body image and eating practices. The second purpose of our study, then, was to explore whether ethnic identity and self-esteem provided buffering interactions with perceived pressure for thinness to predict body preoccupation and ED symptomatology. Because these hypotheses have been proposed independently of the influence of other correlates of ED symptomatology, we did not explore these buffering interactions within the context of the Tylka and Subich (2004) model.

Method

Participants

A sample of 200 Asian American college women between the ages of 17 and 37 years (M = 21.24, SD = 3.54) was obtained by Internet data collection. This sample size exceeded the number of participants needed to estimate the models (using a conservative cases-to-parameter ratio of 10:1; Hu & Bentler, 1999) and could detect increments of 2% of the criterion variance for the hierarchical regression analyses (Cohen, 1992). When asked their specific Asian ethnic background, most (31.5%) identified as Chinese, followed by Vietnamese (21.0%), Filipino (8.0%), Korean (8.0%), Taiwanese (7.5%), Thai (5.0%), Indonesian (4.5%), Japanese (1.5%), Hmong (0.5%), Bengali (0.5%), Nepali (0.5%), and Laotian (0.5%). Eleven percent indicated ethnic heritage in two or more Asian regions. Most geographic regions of the United States were represented; participants indicated living in the Midwest (23.5%), Northeast (22.0%), West (18.5%), South (15.5%), East (7.5%), Southeast (6.5%), and North-west (6.5%). Regarding college status, 22.5% were freshmen, 22.0% were sophomores, 19.0% were juniors, 26.5% were seniors, and 10.0% were graduate students. Most reported being single (75.5%), whereas 17.5% indicated being involved in a long-term relationship, 6.5% were married, and 0.5% were divorced. Eighteen percent reported family incomes at or below $25,000, 24.0% reported between $25,001 and $50,000, 20.0% reported between $50,001 and $75,000, 17.5% reported between $75,001 and $100,000, and 20.5% reported more than $100,000.

Measures

The Perceived Sociocultural Pressure Scale (PSPS; Stice, Zieman, Margolis, & Flick, 1996) contains eight items that assess the degree of perceived pressure to be thin from family, friends, dating partners, and the media (e.g., “I’ve felt pressure from my friends to lose weight”). Participants select one of three possible responses: no pressure (scored as a 1), some pressure (scored as a 2), and a lot of pressure (scored as a 3). Item responses are averaged; higher scores represent greater perceived pressure to be thin. Among a sample of predominantly Caucasian high school and college women, the PSPS was internally consistent (α = .87), stable over a 2-week period (r = .93), and related to retrospective reports of parental pressure to lose weight during childhood (average r = .51; Stice, Zieman, et al., 1996).

The Internalization subscale of the Sociocultural Attitudes Toward Appearance Questionnaire (SATAQ-I; Heinberg, Thompson, & Stormer, 1995) measures women’s internalization of society’s emphasis on appearance in general and on thinness in particular (e.g., “Photographs of thin women make me wish that I were thin”). Each of its eight items is rated on a scale ranging from 1 (completely disagree) to 5 (completely agree). Items are averaged to obtain a total score; higher scores indicate greater internalization of the thin ideal. Among samples of mostly Caucasian women, the SATAQ-I is unidimensional and yields evidence of internal consistency reliability (e.g., α = .88; Heinberg et al., 1995) and convergent validity due to its strong relation to another measure assessing internalization of the thin ideal (Tylka & Subich, 2004).

The Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965) is the most widely used measure of self-esteem (Lee, 2003). It contains 10 items (e.g., “I take a positive attitude toward myself”) that are rated on a 4-point scale ranging from 1 (strongly disagree) to 4 (strongly agree). Items are averaged, with higher scores indicative of higher self-esteem. Among Asian American college students, the RSES has been found to demonstrate evidence of internal consistency reliability (α = .88; Lee, 2003) at levels similar to those found with mostly Caucasian college women (e.g., α = .89; Johnson & Petrie, 1996). Its test–retest reliability estimates over a 2-week period (e.g., r = .85) are adequate, and its moderate-to-strong relations to other self-esteem instruments are suggestive of its convergent validity (Robinson & Shaver, 1973).

The Ethnic Identity subscale of the Multi-Group Ethnic Identity Measure (MEIM–EL; Phinney, 1992) contains 14 items (e.g., “I have a strong sense of belonging to my own ethnic group”) assessing ethnic identity achievement, affirmation and belonging, and ethnic behaviors. Each item is rated on a 4-point scale ranging from 1 (strongly disagree) to 4 (strongly agree). Item responses are averaged, and higher scores reflect higher levels of...
ethnic identity. This subscale yields scores demonstrating acceptable internal consistency reliability (α = .87) and concurrent validity (i.e., moderate relations with measures of self-esteem and social connectedness) among Asian American college students (Lee, 2003).

The Body Shape Questionnaire—Revised–10 (BSQ–R–10; Mazzeo, 1999) includes 10 items measuring the strength or salience of negative body image attitudes (e.g., “Have you found yourself brooding about your shape?”). Items are rated from 1 (never) to 6 (always) and summed. Scores can range from 10 to 60; higher scores indicate greater body preoccupation. With data obtained from two samples of predominantly Caucasian women, Mazzeo (1999) found strong evidence for its internal consistency (α = .96), consistency over a 3-week period (r = .91), and unidimensionality. Mazzeo also noted that the BSQ–R–10 was strongly related to measures of body dissatisfaction and ED symptomatology, yielding convergent and concurrent validity evidence.

The Eating Attitudes Test–26 (EAT-26; Garner, Olmsted, Bohr, & Garfinkel, 1989) was used to determine women’s ED symptomatology, as researchers (e.g., Mazzeo, 1999) have suggested that it can be used as a continuous measure of disordered eating with nonclinical samples of women. Each of its 26 items is rated on a 6-point scale, ranging from 1 (never) to 6 (always). A sample item is “I find myself preoccupied with food.” We scored the EAT-26 continuously, the method least likely to influence the data. Although the EAT-26 contains subscales, a total scale score typically is used within research (e.g., Brookings & Wilson, 1994; Iyer & Haslam, 2003; Mazzeo, 1999; G. Tsai et al., 2003; Tylka, 2004; Tylka & Subich, 2004). Therefore, responses for the 26 items were summed, with higher scores representing higher ED symptomatology. Among samples of mostly Caucasian women, its internal consistency and 3-week test–retest reliability estimates were very good (i.e., α = .91, r = .91; Mazzeo, 1999), and convergent validity was supported via its strong relations to measures of drive for thinness and bulimia (Brookings & Wilson, 1994).

Procedure

This study was announced in an e-mail message sent to Asian American college student organizations nationwide. This message accurately portrayed the purpose of the study, requesting that Asian American women fill out measures assessing pressures for appearance, body image, beliefs about attractiveness, eating behaviors, ethnic identity, and self-concept. Prior to completing the surveys, they received an informed consent form that explained that although all standard precautions were taken, the complete security of the data could not be guaranteed, as the transmission of survey data via the Internet is not completely secure. They were told that the security of the data was guaranteed once the researchers received it. Interested participants were directed to an address on the Web where they could access and complete the measures and a demographic information form. They were instructed to create a password for login registration that helped maintain their anonymity. No identifying information was collected, but participants were given an option of including their e-mail address if they wished to receive a summary of the findings and be entered into a lottery to win $50. Measures were counterbalanced within two administrations (their order as presented in the Measures section and the opposite) to control for order effects.

Although there are strengths to collecting data via the Internet, such as obtaining a demographically diverse sample, this method could result in erroneous data (Schmidt, 1997). Therefore, we incorporated several strategies to reduce the likelihood of obtaining inaccurate data. We carefully screened e-mail addresses to ensure that the same person did not submit a completed survey more than once. As recommended by Schmidt (1997) and Dillon and Worthington (2003), we screened for duplicate surveys by examining the date, time, and origin of submission for each survey. One duplicate survey was identified; it was deleted from the data set. To control for intentional submission of inaccurate information, inattentiveness, and random responding, we included several items as a validity check. Two items asked participants to indicate their race and gender (to screen out those who were not Asian American women), and participants were asked to not respond to two filler items. Also, because the full range of possible scores for our measures was represented in our sample and total scores were normally distributed, it is unlikely that the results are strongly influenced by self-selection bias.

Results

Three women who had a significant amount of missing data (i.e., 25% or more of the data points missing from at least one measure) were not entered into the data set. Of the 200 participants included in our data set, 7 had a total of either one or two data points missing; no participant left more than one item on a measure blank. These missing data points were handled by substituting participants’ mean scale or subscale scores for the missing value. Skewness and kurtosis for each measure were evaluated via significance tests and visual appearance of the measure distributions. It was determined (per Tabachnick & Fidell, 1996) that no substantial violations existed that would jeopardize the assumptions of our analyses. Scale and subscale means, standard deviations, alpha levels, and correlations were examined and are presented in Table 1.

Path Analyses

Path analysis procedures contained within the Mplus program (Muthén & Muthén, 2001) were used to determine whether the models presented in Figures 1 and 2 provided a good fit to the data. Because all measures were continuous, the maximum likelihood method of model estimation was used. The maximum likelihood method uses a covariance matrix with conventional standard errors and a mean-adjusted chi-square test statistic. Mplus contains several indices to estimate the fit of the model to the data: the chi-square/d egrees of freedom (χ²/df) test, the comparative fit index (CFI), the Tucker–Lewis index (TLI), the standardized root-mean-square residual (SRMR), and the root-mean-square error of approximation (RMSEA); but note that the goodness-of-fit index [GFI] and the adjusted goodness-of-fit index [AGFI] are not computed as part of the Mplus program. Conservative standards of evaluating model fit were used in the present study. Specifically, as recommended by Hu and Bentler (1999) and Kelloway (1998), models with CFI and TLI values equal to or greater than .95, SRMR and RMSEA values less than .05, and χ²/df values below 5.0 indicate an adequate fit to the data.

Total scores on the measures served as the observed variables in the model. We specified Mplus to detect modification indices above 5.0, as there may be significant paths between variables that were not hypothesized and examined in the model. Researchers (e.g., Kelloway, 1998) suggested that paths with modification indices of above 5.0 should be estimated in the model. First, we evaluated the fit of the model proposed in Figure 1 (Model 1). The results of Model 1 were mixed; the CFI (.98), χ²/df (2.66), and SRMR (.04) supported its fit, and the TLI (.94) and RMSEA (.09) did not support its fit. As hypothesized, all model paths were significant (p < .05). This model accounted for 41.6% of the variance in ED symptomatology. One modification index exceeded 5.0 (i.e., the path from internalization of the thin ideal to ED symptomatology was 7.45). Therefore, we included this path
and reanalyzed the model. All fit statistics indicated an excellent fit to the data (CFI = 1.00, TLI = 1.03, SRMR = .01, RMSEA = .00, \( \chi^2/df = 0.20 \)), and all model paths were significant (\( p < .05 \)). The path coefficients are presented in Figure 3. This revised Model 1 accounted for 43.8% of the variance in participants’ ED symptomatology.

We then tested the second model (presented in Figure 2) that included the variables and paths of Model 1 with the inclusion of ethnic identity as a variable and paths specified from ethnic identity to self-esteem, internalization of the thin ideal, body preoccupation, and ED symptomatology. To be consistent with the revised Model 1, we also specified a direct path from internalization of the thin ideal to ED symptomatology. Although all fit statistics indicated that the second model fit the data well (CFI = 1.00, TLI = 1.04, SRMR = .01, RMSEA = .00, \( \chi^2/df = 0.22 \)), not all paths were significant. As can be seen in Figure 4, ethnic identity only predicted unique variance in self-esteem; contrary to hypotheses, ethnic identity did not predict unique variance in internalization of the thin ideal, body preoccupation, or ED symptomatology. Model 2 accounted for 43.1% of the variance in ED symptomatology.

Hierarchical Multiple Regression (HMR) Analyses

Next, we used HMR in four analyses to explore whether each proposed moderator variable (i.e., ethnic identity and self-esteem) individually buffered the pressure for thinness–body preoccupation and pressure for thinness–ED symptomatology relations. This analysis is argued to be the preferred method for identifying the presence and nature of moderating effects (Aiken & West, 1991). Scale scores for the predictor and moderator variables were centered to reduce multicollinearity between the main effect and interaction terms (Frazier, Tix, & Barron, 2004).

Following Aiken and West’s (1991) guidelines for HMR, the predictor and moderator were entered at Step 1 of the analysis. Next, at Step 2, the interaction term (e.g., pressure for thinness × ethnic identity) was entered. Evidence for a moderator effect is

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* \( p < .05 \). ** \( p < .01 \). *** \( p < .001 \).
noted by an increment in $R^2$ ($\Delta R^2$) in Step 2 and a statistically significant beta weight. Increments in $R^2$ at .02 and above signify unique contributions to the criterion (Cohen, 1992). Findings for these analyses are presented in Table 2.

We first determined whether ethnic identity buffered the relation between pressure for thinness and body preoccupation. Ethnic identity moderated this relation; however, the interaction between pressure for thinness and ethnic identity was in an opposite direction than expected. Ethnic identity intensified rather than buffered the relation between pressure for thinness and body preoccupation. This interaction accounted for 2% of the variance in body preoccupation. Second, we tested whether self-esteem buffered the pressure for thinness–body preoccupation relation. Consistent with expectations, we found that self-esteem buffered this relation; the interaction of pressure for thinness and self-esteem accounted for 2% of the variance in body preoccupation.

The regression slopes of these two significant interactions were plotted in graphs (see Figures 5 and 6) using predicted values for body preoccupation calculated from representative groups 1 standard deviation ($SD$) above the mean and 1 $SD$ below the mean on pressure for thinness and the moderator variable (Aiken & West, 1991; Frazier et al., 2004). These predicted values were obtained by multiplying the unstandardized regression coefficient for each centered variable by its appropriate value (i.e., 1 $SD$ or $-1 SD$ of the pressure for thinness for the first term, 1 $SD$ or $-1 SD$ of the moderator for the second term, and the product of the pressure for thinness and moderator $SD$s for the interaction term), summing these products, and adding the constant value. For each interaction, a simple slope analysis was conducted. Pressure for thinness strongly predicted body preoccupation for women 1 $SD$ above the mean on ethnic identity, $\beta = .73; t(199) = 9.22, p < .01$; whereas pressure for thinness moderately predicted body preoccupation for women 1 $SD$ below the mean on ethnic identity, $\beta = .48; t(199) = 6.11, p < .01$. For women 1 $SD$ above the mean on self-esteem, pressure for thinness moderately predicted body preoccupation, $\beta = .46; t(199) = 5.76, p < .01$; whereas for women 1 $SD$ below the mean on self-esteem, pressure for thinness strongly predicted body preoccupation, $\beta = .69; t(199) = 9.20, p < .01$.

Third, we examined whether ethnic identity buffered the relation between pressure for thinness and ED symptomatology. Contrary to hypotheses, ethnic identity did not moderate this relation; the interaction of pressure for thinness and ethnic identity accounted for 0% of the variance in ED symptomatology. Last, self-esteem was tested to determine whether it buffered the pressure for thinness–ED symptomatology relation. Also unexpectedly, self-esteem was not found to buffer this relation. The interaction of pressure for thinness and self-esteem accounted for a negligible (1%) amount of the variance in ED symptomatology.

**Discussion**

Our findings contributed incrementally to the literature on Asian American women’s body preoccupation and ED symptomatology in four main ways. First, we garnered empirical evidence for the cross-ethnic validity of a model proposed by Tylka and Subich (2004). In accordance with this model’s proposed paths, we found that Asian American women’s perceived pressure for thinness slightly predicted their self-esteem and moderately predicted their body preoccupation both directly and indirectly through internalization of the thin ideal, providing empirical support for Root’s (1990, 2001) hypotheses. Asian American women’s self-esteem slightly predicted their body preoccupation both directly and indirectly through internalization of the thin ideal; this finding is consistent with the results of A. S. Pan (2000), C. Tsai et al. (1998), and Yoshimura (1995). Our finding that Asian American women’s body preoccupation strongly predicted their ED symptomatology upholds initial research supporting the relation between these variables (Humphry & Ricciardelli, 2004; G. Tsai et
Table 2
Hierarchical Multiple Regression Analyses Predicting Body Preoccupation and Eating Disorder (ED) Symptomatology From Pressure for Thinness, Hypothesized Moderator Variables (Self-Esteem, Ethnic Identity), and Interactions (N = 200)

<table>
<thead>
<tr>
<th>Variable</th>
<th>B</th>
<th>SE</th>
<th>β</th>
<th>B</th>
<th>SE</th>
<th>β</th>
<th>Cumulative R²</th>
<th>Adj. R²</th>
<th>Incremental R²</th>
<th>F(199)</th>
</tr>
</thead>
</table>
| Criterion: Body preoccupation (Overall F[3, 196] = 41.30***)
| Step 1         |      |    |       |      |    |       |               |         |                |        |
| Pressure for thinness (PT) | 8.34 | .78 | .61   | 8.34 | .78 | .61   | .37           | .36     | .37            | 10.72***|
| Ethnic identity (EI) | −.48 | 1.29 | −.02  | −.48 | 1.29 | −.02  |               |         | −.37           |        |
| Step 2         |      |    |       |      |    |       |               |         |                |        |
| PT × EI        | 3.45 | 1.58 | .83   | 3.45 | 1.58 | .83   | .39           | .38     | .02            | 2.18*  |
| Criterion: Body preoccupation (Overall F[3, 196] = 45.49***)
| Step 1         |      |    |       |      |    |       |               |         |                |        |
| Pressure for thinness (PT) | 8.00 | .77 | .58   | 8.00 | .77 | .58   | .39           | .39     | .39            | 10.39***|
| Self-esteem (SE) | −3.36 | 1.19 | −.16  | −3.36 | 1.19 | −.16  |               |         | −2.83**        |        |
| Step 2         |      |    |       |      |    |       |               |         |                |        |
| PT × SE        | −3.08 | 1.43 | −.73  | −3.08 | 1.43 | −.73  | .41           | .40     | .02            | −2.16* |
| Criterion: ED symptomatology (Overall F[3, 196] = 6.76***)
| Step 1         |      |    |       |      |    |       |               |         |                |        |
| Pressure for thinness (PT) | 2.40 | .56 | .29   | 2.40 | .56 | .29   | .09           | .08     | .09            | 4.27***|
| Ethnic identity (EI) | 1.56 | .93 | .11   | 1.56 | .93 | .11   |               |         | 1.67           |        |
| Step 2         |      |    |       |      |    |       |               |         |                |        |
| PT × EI        | −.88 | 1.16 | −.35  | −.88 | 1.16 | −.35  | .09           | .08     | .00            | −.76   |
| Criterion: ED symptomatology (Overall F[3, 196] = 6.72***)
| Step 1         |      |    |       |      |    |       |               |         |                |        |
| Pressure for thinness (PT) | 2.26 | .57 | .28   | 2.26 | .57 | .28   | .08           | .07     | .08            | 3.95***|
| Self-esteem (SE) | −.43 | .88 | −.03  | −.43 | .88 | −.03  |               |         | −.49           |        |
| Step 2         |      |    |       |      |    |       |               |         |                |        |
| PT × SE        | −1.85 | 1.07 | −.73  | −1.85 | 1.07 | −.73  | .09           | .08     | .01            | −1.74  |

Note. Adj. = adjusted.
* p < .05. ** p < .01. *** p < .001.

...
thinness–body preoccupation–ED symptomatology path was particularly strong within our model. Similar strengths between these variable paths were noted in Tylka and Subich’s (2004) sample of mostly Caucasian women. These findings highlight the substantial influence Western cultural pressures for thinness have on both groups of women’s body preoccupation, regardless of their ethnicity, and the strong impact body image disturbance has on their disordered eating behaviors.

**Figure 5.** Plot of significant pressure for thinness by ethnic identity interaction in predicting body preoccupation scores. EI = ethnic identity; PT = pressure for thinness; low = predicted value for women one standard deviation below the mean; high = predicted value for women one standard deviation above the mean.

<table>
<thead>
<tr>
<th></th>
<th>low PT</th>
<th>mean PT</th>
<th>high PT</th>
</tr>
</thead>
<tbody>
<tr>
<td>low EI</td>
<td>25.32</td>
<td>29.2</td>
<td>33.08</td>
</tr>
<tr>
<td>high EI</td>
<td>21.98</td>
<td>28.9</td>
<td>35.82</td>
</tr>
</tbody>
</table>

**Figure 6.** Plot of significant pressure for thinness by self-esteem interaction in predicting body preoccupation scores. SE = self-esteem; PT = pressure for thinness; low = predicted value for women one standard deviation below the mean; high = predicted value for women one standard deviation above the mean.

<table>
<thead>
<tr>
<th></th>
<th>low PT</th>
<th>mean PT</th>
<th>high PT</th>
</tr>
</thead>
<tbody>
<tr>
<td>low SE</td>
<td>23.53</td>
<td>30.44</td>
<td>37.35</td>
</tr>
<tr>
<td>high SE</td>
<td>23.77</td>
<td>27.66</td>
<td>31.55</td>
</tr>
</tbody>
</table>
Third, we found that ethnic identity intensified the pressure for thinness—body preoccupation relation. Specifically, pressure for thinness and body preoccupation were strongly related for women with high ethnic identity but moderately related for women with low ethnic identity. This finding contradicts the widely endorsed (e.g., Croll et al., 2002; Harris & Kuba, 1997; Kempa & Thomas, 2000; Mok, 1998a; Root, 1990; Striegel-Moore & Cachelin, 1999) but previously untested theory that a strong ethnic identity may protect women of color from allowing Western cultural pressures for thinness to influence their body image. The Asian cultural value of collectivism may explain this finding. Collectivism, which is more likely endorsed by Asian American women high in ethnic identity, emphasizes interpersonal harmony within the family and community and pressure to act and appear in a manner that does not reflect poorly on significant others (Kawamura, 2002). Given that significant others often are the source of pressure for thinness, Asian American women who have higher levels of ethnic identity who are pressured to be thin may feel that their weight reflects badly on their significant others and consequently are more likely to experience body preoccupation. Another plausible explanation of this finding is that Asian American women may report feeling large when they compare themselves to an Asian reference group, as many of their Asian peers may be petite. Therefore, Asian American women with a high ethnic identity may focus on the thinness of their Asian peers more often than would Asian American women with a low ethnic identity (who may compare themselves to their non-Asian peers). Also, recent research (W. H. Pan et al., 2004) has indicated that negative health risks of overweight appear to take effect at a lower body mass for people of Asian descent than for people of European and African descent. Perhaps a collective interest in avoiding obesity may be adaptive at some level for Asian American women.

Ethnic identity, however, did not appear to influence the pressure for thinness—ED symptomatology relation. This finding is also inconsistent with prior theory (e.g., Croll et al., 2002; Striegel-Moore & Cachelin, 1999). Perhaps ethnic identity may be more likely to impact another psychological variable (i.e., body preoccupation) than a behavioral variable (i.e., ED symptomatology) when Asian American women perceive sociocultural pressures for thinness.

A fourth way our findings contributed to the literature was that they demonstrated that self-esteem buffered the pressure for thinness—body preoccupation relation. Pressure for thinness moderately predicted body preoccupation for women with high self-esteem but strongly predicted body preoccupation for women with low self-esteem. This finding upholds assertions that women who hold positive attitudes toward themselves are less likely to allow pressures for thinness to dictate how they feel about their bodies (Striegel-Moore & Cachelin, 1999; Twamley & Davis, 1999). However, self-esteem did not buffer the relation between pressure for thinness and ED symptomatology. Women who have high self-esteem appear to be equally likely as women with low self-esteem to allow pressures for thinness to affect their eating behaviors. Because women who are pressured to be thin are encouraged to equate their self-esteem with their body size (Fredrickson & Roberts, 1997), and self-esteem and body preoccupation are psychological variables, self-esteem may influence their body preoccupation more so than it would a behavioral variable (i.e., ED symptomatology). Nevertheless, because body preoccupation was a strong predictor of disordered eating, elevating Asian American women’s self-esteem so they are more resistant to pressures for thinness affecting their body attitudes may indirectly impact their eating practices.

Although the percentages of variance in body preoccupation accounted for by the interactions of pressure for thinness with ethnic identity (i.e., 2%) and self-esteem (i.e., 2%) appear to be small, these magnitudes are typical of interaction effects found in nonexperimental research designs (McClelland & Judd, 1993). In such designs, the lack of control of variables results in increased measurement error, and this error is increased further when interaction terms are included in the analysis. In addition, interactions that exist are hard to detect in these designs, as it is both difficult and unusual for the moderator to change the direction of the relation between two variables. For these reasons, when moderator effects occur in nonexperimental research, they typically account for only 1% to 3% of criterion variance (McClelland & Judd, 1993).

Despite the contributions the present study made to the literature, it is important to address its limitations. First, our method of data collection may have influenced our findings. We collected our data via the Internet, a method particularly susceptible to the submission of duplicate surveys, incorrect data, random responding, and inattentiveness. Although we incorporated strategies to reduce the likelihood of these factors influencing our data, these strategies may not have controlled for all erroneous data. Also, we tested Asian American college students from multicultural organizations who had access to the Internet, and findings may be different for Asian American women who are not attending college, who are not members of multicultural organizations, and who are unable to use the Internet. There was some range restriction on the Ethnic Identity subscale of the MEIM, possibly because participants were recruited from multicultural organizations. This range restriction may have attenuated the relations between ethnic identity and other variables examined in the study as well as minimized ethnic identity’s role as a buffer of the pressure for thinness—body preoccupation relation and the pressure for thinness—ED symptomatology relation.

Second, the models we tested were limited in certain ways. Data were collected at a single point in time, and as a result, no causal claims can be made about the sequence of variables within the regression and path analyses. Alternative models with different causal assumptions may fit our data equally well. The adequate fit of our models does not imply that they have been proven, and it is appropriate to consider these models exploratory until they are cross-validated and subjected to latent variable structural equation modeling and longitudinal designs. Our models do not include all variables shown to be predictive of disordered eating. Tylka and Subich (2004) included social support and poor interoceptive awareness in their model, and other models (e.g., objectification theory; Fredrickson & Roberts, 1997) contain variables that have been shown to adequately predict disordered eating among predominantly Caucasian women (Tiggemann & Slater, 2001). Further, we examined participants’ perceived pressure for thinness, which may not accurately reflect the actual levels of pressure they experience. We did not control for participants’ actual body mass, which may have influenced our findings. Some researchers (e.g., Arriaza & Mann, 2001) have stressed the importance of controlling...
for body mass when examining correlates of body image and disordered eating among Asian American women.

Third, we grouped all Asian American college women. Asian American is a broad category that includes women of many different ethnic backgrounds (e.g., Chinese, Taiwanese, Thai, etc.), and differences may emerge among women according to their specific background (Yates, Edman, & Aruguete, 2004). Perhaps ethnic identity does serve as a predictor of body preoccupation and ED symptomatology among some particular Asian backgrounds. For instance, G. Tsai et al. (2003) found that ethnic identity was a strong predictor of body image disturbance and disordered eating among Taiwanese American women (Tsai et al., 2003), but ethnic identity did not predict either of these variables among samples of South Asian American women (Iyer & Haslam, 2003) and, according to the present study, Asian American women in general.

Findings garnered from the present study could inform professionals’ practice efforts, particularly for those who work in college settings (e.g., university and college counseling centers). To reduce Asian American college women’s body preoccupation, counseling psychologists and other professionals should focus prevention and treatment efforts jointly in three specific directions: a) lowering sociocultural pressures for thinness by promoting acceptance of all body sizes, b) lowering internalization of the thin ideal, and c) increasing self-esteem, as these variables accounted for 43.4% of the variance in body preoccupation. Also, because self-esteem protected Asian American women from allowing pressures for thinness to negatively affect their body attitudes, it would behoove practitioners to aim to increase their Asian American female clients’ levels of self-esteem when they are facing pressures to be thin. It seems crucial that efforts are made to reduce body preoccupation, as well as internalization of the thin ideal, as these variables accounted for 43.8% of the variance in ED symptomatology. Last, it is important that practitioners do not assume that high levels of ethnic identity protect Asian American college women from experiencing body preoccupation and ED symptomatology.

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