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Eating Disorders in Asian Populations: A Critique of Current Approaches to the Study of Culture, Ethnicity, and Eating Disorders

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There is increasing evidence that eating disorders are present among ethnically diverse populations, and researchers have suggested that investigations in this area may inform the field's understanding of how sociocultural factors are related to the development of eating disorders. Although it is generally accepted that sociocultural factors are key in eating disorder etiology, knowledge on how best to study these influences in diverse groups is still limited. In this article, the authors review how the research literature has explored relationships among culture, ethnicity, and eating disorders in Asian populations and critically examine strategies that have been used to investigate these issues across 1 ethnic/racial group. The methodological challenges encountered in these approaches are identified and considered in the provision of recommendations for future endeavors to improve the field's understanding of how culture is related to eating disorders.

Keywords: eating disorders, culture, ethnicity, Asians, Asian Americans

In the past, eating disorders were characterized as illnesses that affected only young, White, affluent women (Bruch, 1973; Crago, Shisslak, & Estes, 1996; Pike & Walsh, 1996; Root, 1990). Recently, however, research has begun to demonstrate that the syndromes and symptoms of anorexia nervosa (AN), bulimia nervosa (BN), and binge eating disorder (BED) are present in men and women of diverse racial/ethnic, cultural, and socioeconomic backgrounds (Davis & Yager, 1992; Dolan, 1991; Pate, Pumariega, Hester, & Garner, 1992; Pike & Walsh, 1996; Ritenbaugh, Shisslak, Teufel, & Leonard-Green, 1996; Root, 1990; Smith, 1995). Such reports have stimulated increased interest in the presentation of eating disorders in non-Western and non-White populations and have led to the suggestion that the study of eating disorders in diverse groups is essential to improving our understanding of how sociocultural influences may be related to their development (Dolan, 1991; Smith, 1995; Smolak & Striegel-Moore, 2001). In addition, eating disorders often go unrecognized in ethnic minorities or are only acknowledged after they have already progressed to a more severe stage (DiNicola, 1990; King, 1993; Pike & Walsh, 1996; Root, 1990). They are among the most lethal of psychiatric illnesses, with estimated mortality rates ranging from 0.3% to as high as 20.0% (Keel & Mitchell, 1997; Nielsen, 2001), and interventions that occur earlier in the course of certain eating disorders have been related to improved outcomes (Eisler et al., 1997). The importance of early recognition combined with the likelihood that eating disorders may often go unidentified in ethnic minorities make the study of eating disorders in non-White populations an even more critical endeavor.

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Although the importance of studying eating disorders among non-White and non-Western populations has been recognized, little has been written about best approaches in investigating how sociocultural factors influence the development of disordered eating in diverse groups. Previous relevant research has focused mainly on how Western-based values, such as the pressure to be thin and the internalization of thin-body ideals, may put individuals at risk for eating disorders (Stice, 2001). However, the etiology of eating disorders is complex and multifaceted, and it is likely that many other sociocultural factors are involved, an issue that is becoming increasingly apparent as the research begins to include more diverse populations. In this article, we review how previous research has addressed these questions across one racial/ethnic group and, in doing so, identify useful strategies for future investigations exploring sociocultural influences on eating disorders. In critiquing current approaches to the study of eating disorders in Asian populations, we identify the methodological challenges that arise in multicultural eating disorder investigations and provide recommendations for how to best address those challenges in future practice, policy, and research endeavors.

The study of eating disorders among Asian populations has increased dramatically in the last 2 decades, and questions as to how culture, ethnicity, and eating disorders are related for Asians have generated research from many countries via a variety of methodologies. A review of this literature indicates that most of these investigations have used one of three strategies to study these issues. First, numerous studies have investigated whether there are differences in the prevalence rates of eating disorders and their symptoms in Asian countries as compared with rates in more Westernized countries. Second, a number of investigations have studied ethnic group differences by comparing rates of eating disorders between Asians and other ethnic groups living in the same country. A third approach to studying cultural differences has been to explore how acculturation may be related to eating disorders for Asians. Although each of these approaches has been informative, each also raises specific methodological concerns that one may encounter when examining relationships of culture, ethnicity, and eating disorders. To provide a context for the methodological issues that may be relevant to all three of these approaches, we begin by providing an overview of assessment practices in eating disorder research.

Assessment Issues in Eating Disorder Research

Studying Diagnosable Eating Disorders

Research on eating disorders in non-White and non-Western populations has mostly investigated two different types of outcomes: diagnosable eating disorders and eating disorder symptoms. Some researchers have focused on exploring diagnosable eating disorders, such as AN, BN, and BED. Currently, the most commonly used diagnostic criteria in the research of these disorders are outlined in the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed.; *DSM–IV*; American Psychiatric Association [APA], 1994). The key clinical feature of AN is the refusal to maintain a minimally accepted standard of weight. Individuals with AN typically lose weight either by restricting their caloric intake or by binge eating and purging their food. In BN, low weight is not the focus so much as recurrent episodes of binge eating followed by inappropriate compensatory behaviors used to prevent weight gain. Compensatory behaviors in BN can be either purging (e.g., vomiting, laxative abuse) or nonpurging (e.g., fasting, excessive exercise). Finally, a third diagnostic category, known as eating disorder not otherwise specified (EDNOS), is intended to capture those individuals who have disorders of eating that do not meet the criteria for either AN or BN. Within this category, research criteria for a third type of eating disorder, BED, have been proposed. This syndrome features recurrent episodes of binge eating without compensatory behaviors. In BED, binge episodes are characterized by feelings of loss of control, extremely rapid eating, eating without hunger, eating alone, and feelings of disgust or depression regarding eating episodes (APA, 1994).

The study of diagnosable eating disorders can be problematic for several reasons. First, accurate diagnosis requires fairly rigorous assessment. Although some studies have estimated diagnostic prevalence by evaluating whether individuals meet criteria according to self-report questionnaires, research suggests that a face-to-face interview is necessary to accurately assess for diagnosis (Hsu, 1996). As a result, for studies attempting to diagnose eating disorders, researchers have recommended a two-stage design wherein individuals are first screened with a self-report symptom measure and then high scorers are examined via a semistructured interview (Fairburn & Beglin, 1990).

Second, the occurrence of diagnosable eating disorders is extremely low in the general population. In most Westernized, industrialized countries, about 0.5% to 1.0% of young women meet the criteria for AN presented in the *DSM–IV*. Approximately 1.0% to 3.0% of young adult women have BN (APA, 1994; King, 1993; Pike & Walsh, 1996), whereas studies of BED demonstrate rates of about 2.0% to 6.0% in community samples (Spitzer et al., 1992, 1993). Thus, fairly large samples are necessary to detect diagnosable eating disorders and to conduct between-groups comparisons of rates.

Third, varying standards for diagnosing eating disorders exist in the literature. The *DSM–IV* diagnostic criteria represent the most recent revision, but these standards have changed from those published initially in the third edition of the *DSM* (APA, 1980) as well as those from the third edition, revised (*DSM–III–R*; APA 1987). Across these different versions of the *DSM* over the past 2 decades, some criteria have been added, some eliminated, and some changed; as a result, whether a particular individual is diagnosed with AN or BN may depend significantly on which criteria are used. Other diagnostic standards, such as Feighner et al.'s (1972) criteria for AN and International Statistical Classification of Diseases and Related Health Problems criteria (World Health Organization, 1992), have also been used in this research. As a result, many different ways of defining AN and BN exist across the literature, and researchers may actually be studying different variations of these disorders, depending on which criterion set they use.

Finally, the use of *DSM* diagnostic criteria with non-Western or non-White populations may be problematic, because these standards were originally generated from studies of mostly Caucasian populations living in Western countries (Mumford, 1993; Ritenbaugh et al., 1996). As such, these ways of defining eating disorders may be less relevant for Asian populations. Current methods of diagnosing eating disorders require the endorsement of a specific symptom set, yet different patterns of symptom presentation may exist cross-culturally. Because various permutations are possible in terms of meeting *DSM* criteria, even individuals who have the same eating disorder diagnosis may differ in the types of symptoms they express. Researchers have suggested that this misuse of Western criterion sets has contributed to misleading findings when prevalence rates of eating disorders are studied in non-Western and non-White populations (King, 1993; Wildes, Emery, & Simons, 2001). In fact, research with ethnic minority groups in Western countries has indicated that ethnic and cultural variables are more significant in influencing subthreshold eating disorders than clinical pathology (Wildes et al., 2001).

Studying Eating Disorder Symptoms

In response to some of these inherent difficulties of studying diagnosable eating disorders, researchers have turned their focus to a second outcome of interest: the relative prevalence of specific eating disorder symptoms (e.g., body dissatisfaction, binge eating, dieting, compensatory behaviors). These symptoms, which tend to present more frequently in general populations, can be assessed more easily than multisymptom syndromes. Some of these symptoms (e.g., body dissatisfaction, dieting) have also been identified as risk factors for developing diagnosable eating disorders (Stice, 1999). In addition, by looking at specific eating disorder symptoms, researchers can study how ethnic and cultural variation may be related to different types of problematic eating attitudes and behaviors without being confined to Western-based symptom patterns alone.

Eating Disorders and Their Symptoms in Asian Populations: A Review of the Literature

The majority of the studies described in this literature review were identified through keyword searches (e.g., *eating*, *Asian*, *anorexia*) of the PsycINFO (1872–2003) and Medline (1966–2003) databases. We also examined prior reviews and the background sections of published reports to determine additional references. Studies discussed here are limited to those investigations published in English. Although some research on eating disorders among Asians has examined treated cases, studies with clinical samples are limited by the reality that not all cases are treated or diagnosed. In Western countries, treated cases research is especially limited because of low referral rates for Asian patients to eating disorder clinics and ethnic minorities' low utilization of health care services for these types of problems (Cachelin, Veisel, Barzegarnazari, & Striegel-Moore, 2000; Dolan, 1991; Dolan, Lacey, & Evans, 1990; Pike & Walsh, 1996). As a result, although investigations with clinical populations inform this review, our focus is primarily on studies that have surveyed nonclinical populations.

Eating Disorders in Asia: Investigating National Differences

Research conducted in Asian countries has focused mostly on the question of whether the prevalence of eating disorders in these nations differs from the rates found in more Westernized countries. Investigations of both diagnosable eating disorders and eating disorder symptoms are reviewed here and are summarized in Table 1.

India and Pakistan

A very low prevalence of diagnosable eating disorders has been found in Pakistan, with one investigation documenting no cases of AN and only one case of BN (0.4%) by *DSM–III–R* criteria in a sample of 271 schoolgirls (Choudry & Mumford, 1992). This rate is considerably lower than the 2.0% to 3.0% that is commonly reported for high school and college populations in more Westernized countries (Hsu, 1996). Conversely, studies of eating disorder symptoms that used the 26-item Eating Attitudes Test (EAT-26; Garner, Olmsted, Bohr, & Garfinkel, 1982) suggest that "abnormal eating patterns" may exist in 7.0%–29.0% of adolescent girls and young adult women in North India and Pakistan (Choudry & Mumford, 1992; King & Bhugra, 1989). However, both of these studies indicated problems with their assessment procedures and instruments, including concerns that the EAT-26 might not have been a culturally valid measure for use with this population.

Two studies comparing women living in Pakistan with Pakistani and Caucasian women living in England indicated relatively high rates of eating disorder symptoms among women in Pakistan (Mujtaba & Furnham, 2001; Mumford & Choudry, 2000). In one investigation, analyses of the EAT-26 and the Body Shape Questionnaire (BSQ; Cooper, Taylor, Cooper, & Fairburn, 1987) revealed no differences between the two British groups, yet the Pakistani women demonstrated significantly higher levels of body dissatisfaction and other eating disorder symptoms when compared with both groups of British women (Mumford & Choudry, 2000). In another study, British Asian and Pakistani women were found to have significantly higher total EAT-26 scores as well as higher scores on the three EAT-26 subscales of dieting, bulimia and food preoccupation, and oral control when compared with British Caucasian women (Mujtaba & Furnham, 2001).

Hong Kong, Singapore, and China

Similar to South Asian countries, the prevalence of diagnosable eating disorders in Hong Kong appears quite low. Two studies that used two-stage questionnaire and interview designs found no cases of AN and rates of 0.003%–1.3% for BN according to *DSM–III–R* criteria among male and female college students (Z. F. Chun et al., 1992; S. Lee, 1993). Nevertheless, eating disorder symptoms are quite prevalent among Chinese populations living in Hong Kong and Singapore. Several studies have provided evidence that body dissatisfaction and other symptoms are present in both male and female university students in Hong Kong, with women expressing greater symptom levels than men, a trend similar to that found in studies conducted in more Westernized countries (Davis & Katzman, 1997; S. Lee, 1993; S. Lee, Leung, Lee, Yu, & Leung, 1996). Two studies with high-school-age Chinese girls in Singapore and Hong Kong reported rates of eating disorder symptoms similar to or even higher than levels previously found among English schoolgirls and American college students (Kok & Tian, 1994; S. Lee & Lee, 2000). Two cross-cultural investigations that surveyed individuals in Asia and the United States at the same time suggest that it may be important to distinguish between Chinese populations living in Hong Kong and those residing in mainland China. Hong Kong Chinese university students reported both significantly greater weight dissatisfaction and more dieting behaviors than U.S. participants in one study (Davis & Katzman, 1998). Conversely, another investigation found greater body dissatisfaction among Chinese individuals living in China, compared with Chinese Americans and White Americans, but higher rates of disordered eating behaviors for White Americans when compared with Chinese and Chinese American groups, whose rates were similar (Pan, 2000).

Japan

Reviews of epidemiological research have suggested that rates of diagnosable eating disorders in Japan are similar to those found in Western countries (APA, 1994; Pike & Walsh, 1996). However, no rigorous two-stage studies were identified that were conducted with general populations in Japan to establish prevalence rates of AN, BN, and BED, with the exception of one large epidemiological study that reported a relatively low prevalence of 0.0795% for AN among boys and girls ages 12 to 14 years

Table 1
Summary of Studies Conducted in Asia

Study	Country	Population	Sample	Assessment	Findings relative to Western countries
Choudry & Mumford (1992)	Pakistan	Middle and high school girls	$N = 271$	EAT-26, interview	− BN
King & Bhugra (1989)	North India	High school and college girls	$N = 580$	EAT-26	+ Over cut-point of 20
Mumford & Choudry (2000)	Pakistan and U.K.	Women attending fitness gyms	29 British Asian, 35 Pakistani, 40 British Caucasian	EAT-26, BSQ	+ Disordered eating[a] + Body dissatisfaction[a]
Mujtaba & Furnham (2001)	Pakistan & U.K.	College women	114 Pakistani, 116 British Caucasian, 118 British Asian	EAT-26	+ Total score[b] + EAT-26 subscales[b]
Z. F. Chun et al. (1992)	Hong Kong	Medical college men and women	$N = 509$	EDI, study questionnaire, interview	− AN − BN
S. Lee (1993)	Hong Kong	College men and women	$N = 1,020$	EAT, EAT-26, interview	− AN − BN − Total EAT − Total EAT-26
S. Lee et al. (1996)	Hong Kong	College men and women	$N = 1,581$	Study questionnaire	No comparisons
Davis & Katzman (1997)	Hong Kong	College men and women	$N = 309$	Body Esteem Scale	No comparisons
Kok & Tian (1994)	Singapore	High school girls	$N = 656$	EDI	+ Bulimia subscale + Body dissatisfaction = Drive for thinness
S. Lee & Lee (2000)	Hong Kong	High school girls	$N = 796$	EAT-26	+ Total EAT-26
Davis & Katzman (1998)	Hong Kong & US	College men and women	192 Chinese American, 309 Hong Kong Chinese	Ideal/actual BMIs, EDI (drive for thinness)	+ Weight dissatisfaction + Dieting
Pan (2000)	China & US	Adult women	91 White American, 144 Chinese American, 152 Chinese	EDI, EAT-26, Multidimensional Body Self Relations Questionnaire	− Body satisfaction[c] − Disordered eating[d]
Ohzeki et al. (1990)	Japan	Middle school boys and girls	$N = 36,293$	Low weight, interview	− AN
Kiriike et al. (1988)	Japan	Nursing and junior college women	$N = 456$	Study questionnaire	= Possible BN − Bingeing − Self-induced vomiting
Mukai (1996)	Japan	Middle and high school girls	$N = 827$	EAT-26	= Total EAT-26
Mukai et al. (1994)	Japan	High school girls	$N = 197$	EAT-26	= Total EAT-26
Kamata et al. (1987)	Japan	High school and college girls	$N = 1,250$	Study questionnaire	− Bingeing
Mukai et al. (1998)	Japan & US	College women	130 European American, 171 Japanese	EAT-26, EDI (body dissatisfaction)	+ Body dissatisfaction = Total EAT-26 = EAT-26 subscales

Note. − indicates lower rates in Asian countries; + indicates higher rates in Asian countries; = indicates similar rates. EAT-26 = 26-item Eating Attitudes Test; BN = bulimia nervosa; BSQ = Body Shape Questionnaire; EDI = Eating Disorders Inventory; AN = anorexia nervosa; EAT = Eating Attitudes Test; BMI = body mass index.
[a] Pakistani women had significantly higher rates than both British Asian and Caucasian women. [b] Pakistani and British Asian women had significantly higher rates than British Caucasian women. [c] Chinese women had significantly different scores when compared with both White American and Chinese American women. [d] White American women had significantly different scores when compared with both Chinese and Chinese American women.

(Ohzeki et al., 1990). Another study reported that 2.9% of a sample of 456 female college students was categorized as having BN (Kiriike et al., 1988). However, these diagnoses were made according to scores on a self-report questionnaire and were not confirmed by interviews. This method may not provide an accurate comparison of actual diagnostic rates, but it does suggest similar levels of bulimic symptoms in Japanese students when compared with Western populations. Investigations of eating disorder symptoms among female high school students in Japan have also demonstrated that mean EAT-26 total scores were similar to means reported previously in Western countries (Mukai, 1996; Mukai, Crago, & Shisslak, 1994).

This evidence suggests comparable levels of overall symptom rates between Japan and Western countries; however, two studies that focused on the prevalence of specific symptom domains indicated there may be variation in the rates of certain types of eating disorder symptoms. For example, research demonstrates relatively low rates of bingeing and purging among high school, college, and professional school students in Japan when compared with previously established rates of these behaviors in U.S. college students (Kamata, Nogami, & Momma, 1987; Kiriike et al., 1988). In addition, one cross-cultural study comparing college women in Japan and European American students in the United States on the EAT-26 and the Body Dissatisfaction subscale of the Eating Disorders Inventory (EDI; Garner, Olmsted, & Polivy, 1983) found that although Japanese women reported significantly greater body dissatisfaction than Caucasian American women, there were no differences in other eating disorder symptoms (Mukai, Kambara, & Sasaki, 1998).

A Critique of Investigating National Differences

The studies reviewed here have focused on eating disorders among a very diverse group of South and East Asian countries. Yet all of these investigations have concluded that prevalence rates of diagnosable eating disorders were lower in these countries when compared with rates in Western countries. In contrast, the most rigorous studies (i.e., those that used valid measures, assessed large samples, made direct comparisons, etc.) of eating disorder symptoms suggest that in South and East Asian populations, rates of body dissatisfaction are similar to and sometimes even higher than those levels found in more Westernized countries and that other eating disorder symptoms are at least as common. This pattern, where symptom rates are similar or higher yet the prevalence of diagnosable eating disorders is still relatively low, suggests that the current diagnostic algorithm for assessing eating disorders may be less relevant for Asian populations. In other words, the Western-based diagnostic criteria currently in use may not be appropriate for capturing the symptom patterns present among individuals living in Asian countries.

Published descriptions of clinical populations also suggest that individuals who receive treatment for eating disorders in Asian countries may present with different symptom profiles than Western patients. Several clinical case studies have suggested that eating disorder patients in India may be less likely to exhibit symptoms of body image disturbance compared with their counterparts in more Westernized countries (Chadda, Malhotra, Asad, & Bambery, 1987; Chandra et al., 1995; Khandelwal & Saxena, 1990). Similarly, some clinical reports from Hong Kong have proposed that body image symptoms may be less common in Chinese patients (Lai, Pang, & Wong, 1995; S. Lee, Chiu, & Chen, 1989). In terms of weight control methods, researchers have noted that most Chinese individuals with AN tend to engage in restricting rather than purging (Lai, 2000) and that individuals with BN tend to engage in laxative abuse rather than vomiting, which is more common in the West (S. Lee, Hsu, & Wing, 1992).

Although symptom patterns may vary for South and East Asian populations, the finding that rates of eating disorder symptoms are similar to or higher than Western rates suggests that there are significant levels of pathological eating in Asian countries that warrant further study. In addition, studies with both nonclinical and clinical populations suggest that one important goal for future investigations is to clarify the relative presentation of specific types of symptoms and how this might differ from typical patterns found in more Westernized countries.

Eating Disorders Among Asians in Western Countries: Investigating Ethnic Differences

Although the study of national differences is informative, it only reveals a limited part of the picture. Researchers also have examined the role ethnicity and culture may play in the development of eating disorders by comparing rates of eating disorders between Asians and individuals of other ethnic groups living in the same country. Research into ethnic

group differences has mostly been conducted with Asian populations living in the United States and the United Kingdom. Thus, the second focus of this review is on investigations of eating disorders in Asians living in more Westernized countries. These studies are summarized in Table 2.

Although research in Asian countries has focused mainly on the population of the specific country studied, it is important to note that when Asians are studied in Western countries, individuals in an Asian sample may actually be quite diverse in terms of ethnicity and culture. For instance, unless otherwise noted, in the majority of research from the United Kingdom, the term *Asian* often refers specifically to individuals who have immigrated or whose families have emigrated from the Indian subcontinent. In the United States, this term may represent a wide range of East Asian, Southeast Asian, and other Asian ethnic groups.

In addition, although further research is still necessary to determine the exact rates of eating disorders for different age groups, the presentation of pathological eating has been found to vary by age. The prevalence of AN and BN seems to be slightly lower at either end of the age spectrum, with young children and older adults being less likely and older adolescents or young adults being more likely to have these disorders (Garvin & Striegel-Moore, 2001). This may be caused by the greater likelihood for age of onset to be during late adolescence or early adulthood as well as cohort effects related to increasing incidence (Fairburn, Hay, & Welch, 1993; Garvin & Striegel-Moore, 2001). In contrast, BED may be more prevalent among adults, with most individuals presenting between the ages of 30 and 50 (Grilo, 2002). In the review that follows, we describe studies that have been conducted with children and adolescents separately from those that have been conducted with adults.

United Kingdom

Adolescents. Only one study has used a two-stage design to compare rates of diagnosable eating disorders between Asians and Caucasians living in the same country. This often-cited study came to the unexpected conclusion that adolescent South Asian girls have a higher prevalence of BN than Caucasians in the United Kingdom (Mumford, Whitehouse, & Platts, 1991). Out of a sample of 559 high school girls, 3.4% of Asian girls and 0.6% of Caucasian girls were diagnosed as having BN according to *DSM–III–R* criteria, a statistically significant difference.

These findings generated much interest in the presentation of eating disorders in this population and, as a result, prompted a number of studies with British girls who were predominantly of South Asian heritage (i.e., from India, Pakistan, Sri Lanka, or Bangladesh). Some research has investigated the relationship between parental bonding and eating attitudes and behaviors in this population (Ahmad, Waller, & Verduyn, 1994a, 1994b; Furnham & Adam-Saib, 2001; McCourt & Waller, 1995), whereas other studies have focused mostly on comparing and reporting rates of eating disorder symptoms (Furnham & Patel, 1994; Waller, Coakley, & Richards, 1995; Wardle & Marsland, 1990). In general, these studies suggest that British Asian and Caucasian adolescent girls have similar rates of body satisfaction/dissatisfaction. In some investigations, scores on the EAT-26 and its subscales have also demonstrated similar or higher levels of other eating disorder symptoms for British Asian as compared with Caucasian subsamples, with significantly higher scores occurring on the Bulimia and Oral Control subscales in particular. However, these significant differences have not been found consistently among this group of studies, which suggests the need for future investigations to clarify whether differences in specific symptom areas exist.

Among these studies, one investigation by Ahmad et al. (1994b) found that it may be important to account for religious variation when comparing British Asian and Caucasian boys and girls. This study demonstrated that Muslim Asian children had significantly lower scores of body dissatisfaction than Hindu Asian or Caucasian children, although they still scored higher on the EAT-26 Bulimia subscale. Thus, even though Muslim children indicated they were less dissatisfied with their body shape, they appeared to report a higher level of bulimic symptoms.

Adults. Although we identified no studies that described the prevalence of diagnosable eating disorders in British Asian adults, several investigations have explored relative prevalence rates of eating disorder symptoms (Furnham & Husain, 1999; Ogden & Elder, 1998; Wardle, Bindra, Fairclough, & Westcombe, 1993). On the one hand, as a whole, these studies indicate no differences on the EAT-26, on its subscales, or in levels of body dissatisfaction as measured by the BSQ when comparing British Asian and Caucasian women. On the other hand, these studies did find more restrained eating among Caucasian women on the Dutch Eating Behavior Questionnaire (Van Strien, Frijters, Berger, & Defares, 1986).

Table 2
Summary of Studies Conducted in the United States and United Kingdom

Study	Country	Population	Sample	Assessment	Findings for Asians relative to other ethnic groups
Mumford et al. (1991)	U.K.	High school girls	204 Asian, 355 Caucasian	EAT-26, BSQ, EDE	+ BN
Ahmad et al. (1994a)	U.K.	High school girls	71 Asian, 115 Caucasian	EAT-26, BSS	= Total EAT-26 = Dieting = Oral control = Body satisfaction + Bulimia subscale
Ahmad et al. (1994b)	U.K.	High school boys and girls	131 Asian, 223 Caucasian	EAT-26, BSS	+ Bulimia subscale[a] − Body dissatisfaction[a]
McCourt & Waller (1995)	U.K.	Middle and high school girls	158 Caucasian, 178 Asian	EAT-26	+ Total EAT-26
Furnham & Adam-Saib (2001)	U.K.	High school girls	46 White, 122 Asian	EAT-26, BSS	= Body dissatisfaction = Dieting = Bulimia subscale + Total EAT-26 + Oral control
Furnham & Patel (1994)	U.K.	Middle and high school girls	22 White, 74 Asian	EAT-26	= Total EAT-26
Wardle & Marsland (1990)	U.K.	Middle and high school boys and girls	N = 846 (16% Black, 20% Asian, 69% White–Caucasian)	DEBQ (restrained eating)	= Restrained eating
Waller et al. (1995)	U.K.	High school girls	107 Caucasian, 153 Asian	BITE	+ Fasting − Bingeing
Furnham & Husain (1999)	U.K.	College women	55 Asian, 82 Caucasian	EAT-26	= Total EAT-26 = EAT-26 subscales
Ogden & Elder (1998)	U.K.	College women and their mothers	50 Asian, 50 Caucasian	BSQ, DEBQ (restrained eating)	= Body dissatisfaction − Restrained eating
Wardle et al. (1993)	U.K.	High school and college girls	126 Asian, 148 White	BSQ, DEBQ (restrained eating), FRS	= Body dissatisfaction − Restrained eating
Johnson et al. (1984)	U.S.	High school girls	8 American Indian, 25 Hispanic, 33 Asian/Oriental, 43 "other," 161 Black, 985 White	Study questionnaire	= Possible BN
Gross & Rosen (1988)	U.S.	High school boys and girls	35 Asian, 91 Hispanic, 220 Black, 1,057 White	Study questionnaire	= Possible BN
Robinson et al. (1996)	U.S.	Middle school girls	143 Asian, 259 Hispanic, 359 White	EDI (body dissatisfaction)	+ Body dissatisfaction[b]
Story et al. (1995)	U.S.	Middle and high school boys and girls	347 Hispanic, 560 American Indian, 1,075 Asian, 2,668 Black, 29,060 White	Study questionnaire	+ Bingeing[c] + Dieting[d]
Cachelin et al. (2000)	U.S.	Community women	21 Asian, 23 Black, 25 White, 49 Hispanic	Interview based on EDE	= Possible eating disorders = Overeating = Vomiting/fasting
Smart (1999)	U.S.	College women	78 Chicana/Latina, 119 European American, 250 Asian American	QEDD	+ Possible eating disorders[e]

Table 2 (*continued*)

Study	Country	Population	Sample	Assessment	Findings for Asians relative to other ethnic groups
G. Tsai & Gray (2000)	U.S.	Community and college women	257 Asian American	EDI-2	− Possible BN
Nevo (1985)	U.S.	College women	11 unknown, 25 Black, 148 Asian, 505 Caucasian	Study questionnaire	− Possible BN
le Grange et al. (1998)	U.S.	Female dieters and magazine subscribers	125 Hispanic, 222 Black, 397 Asian, 9,227 White	Study questionnaire	= Possible AN, BN, BED
Akan & Grilo (1995)	U.S.	College women	28 Caucasian, 34 Asian American, 36 African American	EAT-26, BSQ, GFF, EDE-Q	= Fear of fat = Body dissatisfaction = Shape/weight concern − Total EAT-26 − Global EDE-Q − Eating concerns − Dietary restraint
Arriaza & Mann (2001)	U.S.	College women	90 Hispanic, 160 Asian, 280 Caucasian	EDE-Q, BMI	= Eating concern = Shape concern = Weight concern − Restraint
Mintz & Kashubeck (1999)	U.S.	College men and women	67 Asian American, 185 Caucasian	WMQ, study questionnaires	= Weight concern − Dieting[f] − Bingeing[f]
Huang (2001)	U.S.	College men and women	67 White/Caucasian, 88 Asian/ Pacific Islander	BULIT-R, EHQ	= Weight concern = Restricting = Bingeing − Compensatory behaviors
Lucero et al. (1992)	U.S.	College women	111 Asian, 162 Caucasian	EAT-26	− Over cut-point of 20
Altabe (1998)	U.S.	College men and women	$N = 335$ (African American, Asian American, Caucasian American, Hispanic American)	FRS, EDI (body dissatisfaction)	− Body image disturbance[g]
C. Y. Tsai et al. (1998)	U.S.	College women	121 Asian foreign students, 249 American students (95% European American)	EDI (body dissatisfaction), TFQ (restrained eating)	− Body dissatisfaction − Restrained eating
Sanders & Heiss (1998)	U.S.	College women	35 Asian, 91 Caucasian	EDI (body dissatisfaction), EAT, GFF	= Total EAT-26 = Body dissatisfaction + Fear of fatness

Note. − indicates lower rates in Asians; + indicates higher rates in Asians; = indicates similar rates. EAT-26 = 26-item Eating Attitudes Test; BSQ = Body Shape Questionnaire; EDE = Eating Disorders Examination; BN = bulimia nervosa; BSS = Body Satisfaction Scale; DEBQ = Dutch Eating Behavior Questionnaire; BITE = Bulimic Investigatory Test, Edinburgh; FRS = Figure Rating Scale; EDI = Eating Disorders Inventory; QEDD = Questionnaire for Eating Disorder Diagnoses; EDI-2 = Eating Disorders Inventory–2; AN = anorexia nervosa; BED = binge eating disorder; GFF = Goldfarb Fear of Fat Scale; EDE-Q = Eating Disorders Examination–Q; BMI = body mass index; WMQ = Weight Management, Eating, and Exercise Habits Questionnaire; BULIT–R = Bulimia Test—Revised; EHQ = Eating Habits Questionnaire.
[a] Muslim Asian adolescents had significantly different scores compared with both Hindu Asian and Caucasian adolescents. [b] Only in lowest weight girls (25th percentile or less). [c] Only in girls. [d] Only in boys. [e] European Americans significantly greater rates compared with Asian Americans. [f] Only in women. [g] Caucasian and Hispanic Americans significantly greater than Asian and African Americans.

United States

Adolescents. Two studies on the correlates of BN among high school students in the United States reported no differences in rates of diagnosable eating disorders between ethnic groups when comparing White, Black, Asian, Hispanic, American Indian, and other students (Gross & Rosen, 1988; Johnson, Lewis, Love, Lewis, & Stuckey, 1984). However, both of these investigations evaluated individual items from self-report measures to determine whether diagnostic criteria were met. Although such studies provide valuable information about significant levels of eating disorder symptoms, it is important to recognize that they may not provide the most accurate comparison for rates of diagnosis. In addition, the samples of both investigations were split into two groups: those who met the criteria for a probable diagnosis of BN, and those who did not. No ethnic group differences were found when the researchers compared the small groups of students who had clinical levels of bulimic symptoms with the larger groups of students who had nonclinical levels.

Some studies have found preliminary evidence that there may be relatively higher rates of certain types of eating disorder symptoms in Asian American adolescents when compared with other ethnic groups. For example, although no ethnic differences were revealed in the overall sample, one study conducted in northern California found that Hispanic and Asian girls reported significantly greater body dissatisfaction than their Caucasian peers in a group of the lowest weight girls (Robinson et al., 1996). Another study, from Minnesota, indicated that Asian girls reported more binge eating and out-of-control eating when compared with all other girls, whereas Asian boys reported greater levels of dieting when compared with all other boys (Story, French, Resnick, & Blum, 1995).

Adults. Although no two-stage diagnostic studies of prevalence have been conducted with an adult Asian American population, several investigations have used either an interview or a questionnaire to compare rates of probable eating disorders among multiethnic samples. At least two have found no differences in rates of probable eating disorders in samples of Hispanic, White, Black, and Asian women (Cachelin et al., 2000; le Grange, Stone, & Brownell, 1998). In contrast, three more studies with mostly college-age samples have reported lower rates of possible BN and other eating disorder diagnoses among Asian American women when compared with European American or Caucasian women (Nevo, 1985; Smart, 1999; G. Tsai & Gray, 2000).

Several investigations focused specifically on eating disorder symptoms have demonstrated similar levels of body dissatisfaction between Caucasian and Asian American college students but higher levels of other symptoms in Caucasians (Akan & Grilo, 1995; Arriaza & Mann, 2001; Lucero, Hicks, Bramlette, Brassington, & Welter, 1992; Mintz & Kashubeck, 1999). In general, these studies found that Caucasian women reported more dieting/restraint and bingeing than Asian American women; no body image or other symptom differences were found between Caucasian and Asian American men. One study that surveyed both male and female college students found similar levels of weight concern, restricting, and binge eating between ethnic groups, but Caucasian students were more likely to engage in compensatory behaviors than Asian American students (Huang, 2001).

Although it appears that the majority of studies support the notion that Asian and Caucasian Americans experience similar levels of body dissatisfaction but may differ in terms of rates of other eating disorder symptoms, it is important to note that this area of research is still characterized by mixed findings. For example, two investigations conducted with male and female college students demonstrated more body dissatisfaction as well as more restrained eating in Caucasian versus Asian individuals (Altabe, 1998; C. Y. Tsai, Hoerr, & Song, 1998), whereas two studies of adult women found no differences in body dissatisfaction and eating disorder symptoms between ethnic groups (Cachelin et al., 2000; Sanders & Heiss, 1998).

A Critique of Investigating Ethnic Differences

Efforts to investigate ethnic differences have resulted in a diversity of findings that vary depending on the population studied and the country in which the investigation took place. A closer examination of the methods used in these studies suggests that the relationship between ethnic group and eating disorders can be quite complex and, accordingly, may warrant research approaches that can go beyond comparisons of prevalence rates alone. For example, it appears that there are higher rates of eating disorder diagnoses and symptoms in British Asian children and adolescents when compared with their Caucasian counterparts. However, only one of the numerous investigations studying this population took the exploration of significant ethnic differences one step

further by analyzing the influence of religious affiliation on bulimic symptoms. This study found that Muslim Asian children actually differed significantly from Caucasians, whereas Hindu Asian children did not (Ahmad et al., 1994b). Researchers have suggested that some dietary practices associated with religious observances, in particular the Muslim practice of fasting during the day for the month of Ramadan, may be a risk factor for developing eating pathology (Bhadrinath, 1990). Although it is difficult to assess whether the eating patterns of Muslim Asian children measured in this study represent short-term, culturally appropriate behaviors or more serious risk factors for eating disorders, it is important to note the authors' finding that religious affiliation determined differences in eating patterns, not ethnic group. This is just one illustration of how cultural variations that tend to fall along ethnic group lines can be as valuable a focus of study as ethnic group differences.

Although most of the nonclinical population studies reviewed here have concentrated on ethnic group differences, some case and clinical studies conducted with British Asians and Caucasians have suggested that another type of cultural variation may be an important variable for future research. Cultural transition has been strongly implicated in the development of AN in numerous clinical investigations describing British Asian immigrant children (Bendall, Hamilton, & Holden, 1991; Bhadrinath, 1990; Bryant-Waugh & Lask, 1991; Timimi & Adams, 1996). Researchers have hypothesized that parental migration to a Western culture may lead to conflict between the parents' more traditional culture and the new, Western culture to which their children are now exposed, such that the more traditional the family is, the greater the risk is for sociocultural conflict (Bryant-Waugh & Lask, 1991). Thus, future research into constructs such as religious variation and cultural transition may clarify whether there truly are higher rates of eating disorder symptoms for British South Asian girls and, more important, what cultural variations are related to those differences.

The study by Ahmad et al. (1994b) also points to questions about culturally appropriate assessment practices in this area of research. Mainstream assessment measures that were originally developed with Western populations may not be able to clearly distinguish between behaviors that stem from non-Western religious practices and those that represent truly disordered eating. For example, nearly all of the studies reporting more eating disorder symptoms in British Asian children used the EAT-26. Items on this measure include such statements as, "I vomit after I have eaten," "I have gone on eating binges where I feel I may not be able to stop," and "I avoid eating when I am hungry" (Garner et al., 1982; Mumford et al., 1991), behaviors that may or may not necessarily be related to risk for eating disorders. Thus, a closer look at the instruments used to measure eating disorder symptoms in this body of research raises questions as to whether those behaviors being assessed even actually represent eating disorder symptoms for British South Asian children.

In terms of assessment practices, the literature in this area also reinforces the importance of investigating specific symptoms of eating disorders rather than broader constructs. The EAT-26 assesses for an overall score of eating disorder symptoms by asking questions about body image disturbance, binge-eating behaviors, purging behaviors, and restricting behaviors. As a result, the between-groups differences in total EAT-26 scores found in some studies may be caused by ethnic differences in any of the four domains of weight attitudes, bingeing, compensatory symptoms, or restricting symptoms. In the studies reviewed above, when only total scores were reported, it was difficult to identify whether significant findings were actually the result of differences in specific symptom areas or, in the case of null findings, whether similarities in some symptom domains were obscuring differences in other areas.

Findings of higher rates of diagnosable eating disorders and eating disorder symptoms in Asians as compared with Caucasians appear to be specific to British adolescent girls. In contrast, research conducted with adolescents and adults in the United States indicates that Asian Americans have lower rates of diagnosable eating disorders when compared with Caucasian Americans. Although this conclusion is complicated by some studies that found no differences in relative prevalence, a closer examination of these investigations suggests that a lack of power might have contributed to these null findings. For example, one of these American studies (Cachelin et al., 2000) used a sample of only 118 women. A recent meta-analysis found a mean effect size of 0.19 for studies that diagnosed bulimia in non-White populations (Wildes et al., 2001). A chi-square test for this effect and sample size would have a power of only about .55 ($\alpha = .05$) to detect differences. Thus, the conclusion that there were no ethnic group differences in probable eating disorder diagnoses and symptom levels is not surprising. Similarly, although two studies of diagnosable eating disorders in Asian American adolescents reviewed here did recruit large numbers of participants, both were primarily focused

on describing correlates of BN, and race was only reported as a demographic variable (Gross & Rosen, 1988; Johnson et al., 1984). As a result, samples in both cases were heavily skewed, with Caucasians representing at least 75.0% of the samples and Asians representing only about 2.5% of the samples in both studies. This, combined with the low number of individuals categorized as possibly having BN, likely made ethnic differences in rates difficult to detect.

The finding of lower rates of diagnosable eating disorders in Asian American adults is supported by symptom research that suggests that although Asians and Caucasians express similar levels of body dissatisfaction, Caucasians exhibit more eating disorder symptoms, such as restricting, bingeing, and compensatory behaviors (Akan & Grilo, 1995; Arriaza & Mann, 2001; Huang, 2001; Mintz & Kashubeck, 1999). Again, although some studies found no ethnic differences in eating disorder symptoms, issues of power are relevant in evaluating this body of literature as well. A recent meta-analysis found a mean effect size of 0.41 for studies that investigated ethnic group differences in body dissatisfaction or restricting symptoms (Wildes et al., 2001). A two-sample *t* test with equal subgroup sizes would require at least 193 participants to achieve a power level of .80 ($\alpha = .05$), and an even larger sample would be necessary to detect effects with unequal subgroup sizes. Of the nine studies with adult U.S. populations reviewed here, six found no differences on one or more types of eating disorder symptoms. Four of these six investigations had sample sizes that were less than 193, which suggests that a lack of power might have contributed to null findings in some of these cases.

Similar to research from Asian countries, there is controversy among clinical studies as to whether Asian eating disorder patients living in more Westernized countries present with fat phobia symptoms as frequently as their Caucasian counterparts (Lacey & Dolan, 1988; Ratan, Gandhi, & Palmer, 1998; Rieger, Touyz, Swain, & Beumont, 2001). Among adolescent Americans, research has suggested that levels of body dissatisfaction between Asians and Caucasians may be similar except in the lowest weight group of individuals. In this group, Asians expressed greater dissatisfaction than Caucasians. Further research is necessary to confirm and clarify this possible relationship among body mass index (BMI), ethnicity, and body dissatisfaction. In the meantime, a closer look at the body dissatisfaction research reviewed here highlights the importance of controlling for possible confounds, such as BMI, in studying the relationship between ethnicity and eating disorder symptoms. For example, one study found that significant ethnic differences in body dissatisfaction became insignificant when BMI was covaried out (Wardle et al., 1993), and another, which controlled for BMI, also found no ethnic differences in body dissatisfaction but did find differences in other eating disorder symptoms (Dolan et al., 1990). Actual body size is often highly correlated with measures of body dissatisfaction (Stice, 2001), and Asians often have thinner and lighter frames than individuals of other ethnic groups. Thus, those studies that found no ethnic variation in body dissatisfaction levels after accounting for BMI in their analyses may be providing fairly reliable evidence that rates of body dissatisfaction are actually similar across ethnic groups.

In sum, the relationship between ethnicity and eating disorders for Asians living in more Westernized countries differs depending on the population and symptom domain of focus. It is interesting that the findings from studies of adults both in the United States and the United Kingdom suggest a similar pattern, even though the Asian populations in these countries are quite heterogeneous in ethnic composition. In both countries, despite levels of body dissatisfaction being similar, Caucasian adults appear to engage in more restricting, bingeing, and compensatory behaviors than Asian adults. Conversely, a significant amount of research with South Asian girls living in the United Kingdom suggests that this population may be at greater risk for eating disorder symptoms and diagnosable eating disorders compared with their Caucasian counterparts. However, additional research is still necessary to clarify whether the behaviors expressed actually represent problematic eating behaviors or whether they may in fact be culturally appropriate behaviors for certain South Asian groups.

Although these patterns are of interest in answering questions of how ethnicity and eating disorders are related, these findings seem to provoke more questions than they resolve. For example, it appears that South Asian girls' risk for eating disorder symptoms may be related not only to ethnicity but also to other cultural factors that vary with ethnicity. If so, what are these factors? In a similar manner, what prevents Asian adults with similar levels of body dissatisfaction from developing other eating disorder symptoms that their Caucasian counterparts exhibit? Unfortunately, the studies reviewed here cannot answer these questions, as these investigations only reveal whether there are ethnic variations in symptom prevalence rates.

In 1993, Betancourt and Lopez criticized research that only investigates group differences, asserting that this approach does not identify the specific aspects of culture that are thought to influence behavior more directly. In other words, strategies of analyzing national or ethnic differences are limited because they assume that differences in eating disorder symptoms are related to differences in ethnicity. As a result, researchers learn little about the cultural variables that are more likely to contribute to the relationship between ethnicity and eating disorders. To evaluate more closely the influence of cultural differences rather than racial/ethnic differences, researchers have begun to explore the relationship of acculturation to eating disorder symptoms.

Acculturation Research: Investigating Cultural Differences

Acculturation has been defined as the process of adaptation to and adoption of a new culture that occurs as a result of the contact between two different cultures (Berry, Trimble, & Olmedo, 1986). Investigations that focus on acculturation recognize that beliefs and values may be similar across ethnic groups, depending on how much of a particular culture individuals have integrated into their life. These studies have been conducted in both Asian and more Westernized countries and are summarized in Table 3.

The majority of investigations conducted in the United States have found no relationship between acculturation level and eating disorder symptoms (Akan & Grilo, 1995; Gowen, Hayward, Killen, Robinson, & Taylor, 1999; Haudek, Rorty, & Henker, 1999; Hung, 2001). The exceptions are two investigations that detected positive relationships between eating disorder symptoms and acculturation level (Cachelin et al., 2000; Davis & Katzman, 1999). In contrast, the majority of studies with British South Asian schoolgirls have actually found negative relationships for acculturation with body dissatisfaction and other eating disorder symptoms (Furnham & Patel, 1994; Hill & Bhatti, 1995; Mumford et al., 1991). Similar findings were reported in an Australian study in which more acculturated Hong Kong–born women had significantly lower EAT (Garner & Garfinkel, 1979) and Figure Rating Scale (Stunkard, Sorensen, & Schulsinger, 1983) scores than the more traditional participants (Lake, Staiger, & Glowinski, 2000). Only one British investigation has found no relationship between acculturation and body dissatisfaction as measured by the BSQ (Ogden & Elder, 1998).

Two studies of acculturation conducted in Asian countries were identified. Furukawa (1994) found no differences over time on the EDI in a group of 144 Japanese adolescent exchange students who were tested both prior to their placement in various countries around the world and 1 year later, on their return to Japan. These authors concluded that acculturative stress and exposure to more weight-conscious cultures did not cause increased eating disorder symptoms; however, actual acculturation level of the participants in this study was not measured. In Hong Kong, schoolgirls who were considered Anglicized had higher total EAT-26 scores and Eating Disorders Inventory-2 (Garner, 1991) Bulimia subscale scores than those who were Asian identified (Mao, 2000).

A Critique of Investigating Cultural Differences

Despite the long-standing hypothesis that a greater exposure to Western values leads to an increased risk for eating disorders, this review of acculturation research presents no compelling evidence for such a relationship. The majority of studies reviewed here found no relationship between acculturation and eating disorder symptoms; however, many of these investigations might have lacked the power to detect this effect. Among the studies reviewed here, reported correlations for acculturation and eating disorder symptoms ranged between .00 and about .30, Cohen's standard for a medium correlational effect (Rossi, 1990). A study attempting to detect this level of effect would require 85 participants to achieve a power level of .80 ($\alpha = .05$). Two of the studies that assessed for acculturation but did not detect effects had smaller sample sizes than this (Akan & Grilo, 1995; Haudek et al., 1999); therefore, it is still difficult to conclude that there is no relationship for acculturation and eating disorder symptoms.

An additional methodological issue in interpreting this literature concerns the assessment of acculturation. To measure acculturation, several of these studies used questions about years since migration from the home country or language preference that were chosen by the investigators but had not necessarily been found to be valid, reliable assessments of acculturation. As a result, it is uncertain, even in those studies that did find significant relationships, whether it was actually acculturation or another variable, such as language preference, that was related to eating disorder symptoms.

Table 3
Summary of Acculturation Studies

Study	Country	Population	Sample	Acculturation assessment	Findings
Haudek et al. (1999)	U.S.	College women	25 Asian American	SL-ASIA	No relationship with EDI and EDE subscales
Akan & Grilo (1995)	U.S.	College women	34 Asian American	SL-ASIA	No relationship with disordered eating, dieting, body dissatisfaction
Gowen et al. (1999)	U.S.	High school girls	161 Hispanic, 265 Asian, 451 European American	Study questionnaire	No relationship with Weight Concerns Index or EDI (body dissatisfaction)
Hung (2001)	U.S.	High school girls and community women	145 Asian American	SL-ASIA	No relationship with EAT-26 and EDI
Cachelin et al. (2000)	U.S.	Community women	42 Asian, 50 White, 98 Hispanic	Study questionnaire	Group with probable eating disorders more acculturated
Davis & Katzman (1999)	U.S.	College men and women	197 Chinese	SL-ASIA	Positive relationship for women with EDI total, Bulimia subscale, Drive for Thinness subscale
Ogden & Elder (1998)	U.K.	College women and their mothers	50 Asian	Study questionnaire	No relationship with BSQ
Mumford et al. (1991)	U.K.	High school girls	204 Asian	Study questionnaire	"Traditional Asian" scores positively related to EAT-26 and BSQ
Furnham & Patel (1994)	U.K.	Middle and high school girls	74 Asian	Study questionnaire	Integration into British society negatively related to EAT-26
Hill & Bhatti (1995)	U.K.	Middle school girls	55 Asian	Study questionnaire	"Traditional Asian" scores positively related to DEBQ (dietary restraint)
Furukawa (1994)	Japan	Male and female exchange students	144 Japanese	Not assessed	No changes in EDI subscales across time
Mao (2000)	Hong Kong	High school girls	396 Chinese	SL-ASIA	Anglicized group had higher total EAT-26 scores and EDI-2 Bulimia subscale scores than Asian-identified group
Lake et al. (2000)	Australia	College women	42 Hong Kong born	Ethnic Identity Scale	More acculturated group had lower EAT and FRS scores

Note. SL-ASIA = Suinn–Lew Asian Self-Identity Acculturation Scale; EDI = Eating Disorders Inventory; EDE = Eating Disorders Examination; EAT-26 = 26-item Eating Attitudes Test; BSQ = Body Shape Questionnaire; DEBQ = Dutch Eating Behavior Questionnaire; EDI-2 = Eating Disorders Inventory–2; FRS = Figure Rating Scale.

Focusing on those investigations that had a large enough sample size to detect a medium effect size and that used a valid assessment of acculturation leaves only four studies. One of these found no relationship between acculturation and eating disorders (Hung, 2001), two found a positive relationship (Davis & Katzman, 1999; Mao, 2000), and one found a negative relationship (Lake et al., 2000). These apparently mixed findings might also be attributed to problems with the assessment of acculturation. Even valid measures of acculturation actually tend to assess a diverse set of variables involving many types of cultural differences, such as value orientations, language use, social affiliations, popular cultural practices, and eating preferences (Zane & Mak, 2003). The Suinn–Lew Acculturation Scale (Suinn, Ahuna, & Khoo, 1992), the most commonly used acculturation instrument among these studies, assesses differences in language ability, choice of friends, and choice of music. Those investigations that found a relationship between acculturation and eating disorder symptoms could actually be relating any one of these particular aspects to disordered eating. Conversely, when multiple constructs are assessed, null findings may be the result of relationships with some variables obscuring relationships with others.

Although the investigation of acculturation does move the focus off of ethnic group differences and onto how variations in culture are related to eating disorders, inconsistencies in the current literature may also be attributed to the fact that investigators are still focusing on variables that are more distal to the development of eating disorders (e.g., language or music preference) rather than on variables that may be more proximal to eating behaviors (e.g., self-construal, beliefs about control, coping styles and preferences). These variables tend to be more influenced by sociocultural experiences; as a result, these culturally based variables are probably more closely related to the etiology of pathological eating than ethnic group membership or even acculturation.

Methodological Challenges and Recommendations

The three strategies of analyzing national, ethnic, and cultural differences have begun to provide a clearer picture of the prevalence and presentation of eating disorders in Asian populations. They also demonstrate how efforts to study culture, ethnicity, and eating disorders have been addressed across one racial/ethnic group. Throughout this review, we have highlighted several methodological challenges encountered in this research. From these challenges, we now can begin to offer recommendations for future policy, practice, and research with diverse groups in the hope that these efforts can improve our understanding of how sociocultural factors are related to eating disorders. The concerns and recommendations identified here fall broadly into four categories: heterogeneity of the populations studied, the power to detect relationships, the definition and assessment of eating disorders, and the definition and assessment of cultural factors.

Heterogeneity of Populations

As mentioned previously, the term *Asians* can refer to a broad range of several different, extremely diverse groups of individuals. The studies reviewed above describe research that has been conducted in Asian countries as varied as India, Pakistan, Japan, Singapore, and Hong Kong. These regions differ considerably in terms of history, cultural and religious influences, and exposure to Western value systems. In addition, we have also described investigations conducted with heterogeneous groups of individuals with Asian ethnic backgrounds who are living in more Westernized countries. These individuals not only are already quite diverse in their ethnic origins but also have the added influences of differential migration and acculturation histories (L. C. Lee & Zane, 1998; Uba, 1994). Many of the studies reviewed here did not provide explicit information on the geographic, ethnic, and cultural composition of their samples. Nevertheless, even with the limited descriptive information available, it is apparent that research findings may differ according to age, ethnicity, geographic location, and religious affiliation of the population sampled. Multicultural researchers have long stressed the importance of providing more detailed and specific descriptions of samples and sampling methods (Okazaki & Sue, 1995). This is critical as more and more investigations begin to include not only Asian populations and countries but also even more diverse populations and areas. Future reviewers must also aid in recognizing and documenting this heterogeneity to identify how trends in investigative findings may be specific to certain countries or ethnic groups. This practice will allow clinicians and policy makers to be more appropriate and targeted in their application of research conclusions.

Power to Detect Relationships

It is notable that in much of the research reviewed above, no differences in eating disorders and their symptoms were found between groups or no relationships with cultural variables were identified. Although it very well may be the case that there is as much commonality in rates of eating disorders among diverse populations as there are differences, it is important to question how the low power to detect effects may impact this body of research. For example, as discussed previously, assuming an effect size of 0.41 (Wildes et al., 2001), a two-sample *t* test of eating disorder symptom rates would require at least 193 participants with equal subgroup sizes to achieve a power level of .80 ($\alpha = .05$). Of the 21 studies reviewed here that investigated ethnic group differences in eating disorder symptom rates, approximately 40.0% did not have a sample of this size, and, of those that did, the majority did not have equally proportioned subgroups. Most of these studies found no differences on at least one of the types of eating disorder symptoms they assessed, yet it is difficult to interpret such conclusions, as it is unclear whether the null findings are the result of a lack of power to detect differences or an actual similarity in eating disorder rates. Future research that uses powerful samples to study these issues can help to clarify this picture by verifying whether certain symptom types are more common and whether others are more likely to vary with ethnic and cultural variables. Such efforts can provide a richer understanding of what may currently appear to be mixed findings and thus can help to direct researchers, clinicians, and policy makers to more fruitful areas of inquiry within this complex area of study.

Definition and Assessment of Eating Disorders

The many ways of defining eating disorders that have existed over the life span of research in this area not only make it difficult to draw conclusions across studies but also raise the question of whether such diagnostic classifications are relevant for all groups. Studies reviewed here that investigated national differences in eating disorders demonstrated that Western-based criteria might not be as relevant for populations living in Asian countries. Research into the presentation of other types of psychopathology in Asian countries and ethnic groups has similarly found that symptom patterns for disorders such as depression may differ from traditional Western conceptualizations for individuals with Asian backgrounds (K. M. Chun, Eastman, Wang, & Sue, 1998; Uba, 1994). This highlights the importance of studying symptom patterns rather than diagnostic categories when investigating the presentation of pathological eating in diverse ethnic and cultural populations. It is interesting that recent research on the treatment of diagnosable eating disorders has begun to suggest that the three traditional diagnostic classifications of AN, BN, and EDNOS share such similar clinical features and likely common psychopathological mechanisms that a transdiagnostic approach to their treatment may be more appropriate (Fairburn, Cooper, & Shafran, 2003).

In addition, although certain distinct eating disorder symptoms (i.e., body/weight concern, bingeing, restricting, and compensatory behaviors) can be identified from the *DSM* diagnostic criteria, very little research has differentiated between them. Most studies have simply examined general patterns of eating disorder symptoms and have not distinguished among specific symptom types in their analyses. As a result, it is often unclear whether specific symptom types differ, or whether patterns actually are invariant when compared across groups. As a result, even when significant differences are found between groups, without more targeted assessment and analysis of specific symptom types, researchers are left guessing as to the actual patterns of differences and commonalities in the presentation of eating disorders. Moreover, it is possible that these particular symptom areas are not necessarily the patterns that should be studied for Asian populations. More factor analytic studies in the future may provide further information about how symptom patterns may differ for Asians as well as for other groups. Such approaches to studying symptom patterns in diverse populations are appropriate given current trends in the study of eating disorder treatment and, moreover, can provide us with a better understanding of whether the presentation of eating disorders differs across various ethnic and cultural groups.

In the meantime, it is important that researchers, when possible, identify the specific symptom areas where cultural similarities or differences exist. This will allow practitioners and policy makers to define and assess for eating disorders in a more culturally appropriate way. It is also vital that the assessments used to measure these constructs are themselves culturally sensitive and administered in an appropriate manner. Without the use of valid and appropriate assessment methods in these studies, it is difficult to know whether mixed or null findings can be attrib-

uted to actual differences or unreliable measurement. Reports of factor analyses of measures might also improve our understanding of how assessments may be functioning similarly or differently for various groups and could provide further insight into what constructs are actually being measured.

Heppner, Kivlighan, and Wampold (1992) indicated that a goal of research design is to maximize the variance that is explained by the variables of interest and to control for variance created by other related variables. Studies of ethnic group differences in body dissatisfaction have found that significant differences became insignificant when BMI was covaried out (Arriaza & Mann, 2001; Robinson et al., 1996; Wardle et al., 1993). Nevertheless, of the 13 investigations on ethnic differences in body dissatisfaction or shape/weight concern reviewed here, 69.0% either did not assess for BMI in their analyses or, even when ethnic differences were found on BMI, did not control for this in their analysis of body dissatisfaction. Although the relationship of BMI to other eating disorder symptoms is less clear, it is evident that studies of body dissatisfaction in Asians should consider how actual height and weight may confound the relationship with ethnicity and culturally based variables. This is also the case for future research with more diverse populations, because ethnic groups other than Asians may also tend to have different body types and BMIs.

Future efforts also should consider other constructs that vary with eating disorder symptoms and ethnic/cultural variables, such as psychiatric symptoms related to depression, anxiety, and general level of pathology. A study of eating disorder symptoms in a health care clinic population found that Asians had significantly higher depression scores than Caucasians (Dolan et al., 1990). This is consistent with research that has indicated higher levels of depression in immigrant Asians as compared with Caucasians (Uba, 1994). Because previous research has also shown that depression is often comorbid with eating disorders, it may be important for future investigations of eating disorder symptoms to assess for ethnic group differences in depression and control for those differences as necessary. In this way, ethnic or cultural variations in eating disorder symptom patterns will not be confounded with general pathology. The relationships between sociocultural variables and eating disorders are complex, and our understanding of these issues may be enhanced if we also consider the impact of possible confounds.

Definition and Assessment of Cultural Factors

Throughout this review, we have stressed the importance of studying culturally based variables, which may be more relevant to the development of eating disorder symptoms, rather than focusing on distal constructs, such as ethnic group or country of origin. This review has demonstrated that strategies of looking at national and ethnic differences have provided valuable information about the presentation and prevalence of eating disorders and their symptoms in Asian populations. However, these approaches still do not answer the question of whether variations in sociocultural values are related to the presentation of eating disorder symptoms. Similarly, the research on acculturation may be limited, because this approach to investigating cultural differences still does not explore the specific cultural values related to Western and non-Western orientations that underlie the relationship between acculturation and eating pathology. Researchers have suggested that culturally based variables are more proximal to attitudes and behaviors than ethnic group labels or even general acculturation level and therefore should be the specific focus of study in investigations of how culture affects pathology (Betancourt & Lopez, 1993; Zane, Hall, Sue, Young, & Nunez, 2004). Such a concentration on culturally constructed differences rather than ethnic group categories is especially crucial in a "melting pot" environment such as the United States, where individual variation may be influenced as much by geography, religion, and gender as by ethnicity.

As mentioned previously, research on the sociocultural factors that influence the etiology of eating disorders has focused mostly on the impact of such cultural values as the pressure to be thin and thin-body ideals. We know that the development of eating disorders is a process that is complex and multifaceted; similarly, investigations of how cultural values play a part in the etiology and presentation of eating disorders should use methodological approaches that are appropriately sophisticated and broad in scope. For instance, numerous other sociocultural constructs have yet to be examined that could provide rich material for increasing our understanding of how culture is related to eating disorders. Attitudes toward eating, the cultural meaning of food and meals, and diverse, culturally related eating behaviors are just some initial examples of constructs of interest that might be studied. In addition, etiological theories have long stressed the role of processes such as

individuation and the maintenance of control in the development of eating disorders (Bruch, 1978; Minuchin, Rosman, & Baker, 1978; Striegel-Moore, 1993). Researchers have also suggested that these types of processes can be heavily informed by cultural values (McCarty et al., 1999; Uba, 1994); thus, such constructs may also prove to be useful areas of study in efforts to investigate how cultural aspects may contribute to or lessen the likelihood of developing eating disorders. Finally, recent research in eating disorders treatment has suggested that emotional regulation may play an important role in the maintenance of eating disorder symptoms (Polivy & Herman, 1993; Stice, 2001). Again, emotional expression and methods of mood regulation are often culturally constructed (Miyake, Campos, Kagan, & Bradshaw, 1986; Uba, 1994). Improving our understanding of how eating behaviors are related to these processes would provide a much more comprehensive picture of how sociocultural values influence eating patterns in diverse groups. In addition, if such variables are found to be more proximal to eating disorder symptoms, this research would allow practitioners and policy makers to create more effective, targeted, and culturally appropriate programs and treatments than would information about racial/ethnic group differences alone.

The study of eating disorders in diverse populations would also benefit from more refined methodological approaches that can go beyond group comparison designs. For example, investigations of possible mediating variables would allow researchers not only to discover whether groups have different behaviors but also to explore how those behavior differences are created by the varying cultural experiences of diverse groups. A recent study of anger regulation in European and Korean American male batterers provides one example of how investigating mediational relationships can improve our understanding of how ethnic differences may, in fact, reflect cultural variations (Kim & Zane, 2004). In this study, Korean American male batterers were found to control their anger less than their European American counterparts. However, this ethnic difference was found to be mediated by independent self-construal, a culturally based variable that is prevalent in Western cultures and encourages individuals to perceive themselves as bounded and autonomous beings. Greater independence was associated with improved anger control; thus, it was not their ethnic group but rather their tendency to have weaker independent self-construals that accounted for Korean American men displaying lower levels of anger control. Future investigations that use similar methodologies to explore the cultural influences behind ethnic/racial variations in the presentation of eating disorder symptoms could improve our understanding of how diverse sociocultural experiences contribute to those trends.

Despite the fact that researchers have long upheld sociocultural factors as critical in the etiology of eating disorders, our understanding of how cultural values may be related to the development of eating pathology is still relatively rudimentary. Certainly, the growing interest in how eating disorders may present and develop among non-Western, non-White populations might contribute to increased insight into this complex relationship. Although the research reviewed here has focused on Asian populations, it is our hope that the methodological challenges and resulting recommendations identified here might be useful for any future research on eating disorders and their symptoms, especially those investigations conducted with diverse populations.

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