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THE RELATIONSHIP BETWEEN ETHNIC IDENTITY, DISORDERED EATING AND BODY
IMAGE AMONG CHINESE AND CAUCASIAN STUDENTS

A Dissertation

Submitted to the Graduate Faculty of
Louisiana State University and
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Lauren E. Baillie
B.A., The Catholic University of America, 2005
M.A., Louisiana State University, 2008
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Abstract

It is generally believed that Western culture's emphasis on thinness is responsible for the presence of eating disorders and body image dissatisfaction. However, Asians living in Western societies who are more acculturated to Western values have shown fewer body image and eating problems than their less acculturated Asian peers, while those who are highly acculturated to their native culture may be at increased risk for eating disorder symptoms. In this study, Chinese and Caucasian students attending United States universities completed measures of body image, body esteem, disordered eating and ethnic identity in the language of their choice (English or Simplified Chinese). As expected, females demonstrated higher levels of disordered eating and body dissatisfaction than males, regardless of ethnicity. There were no between-ethnicity differences in disordered eating and body image dissatisfaction, though Caucasians demonstrated higher ratings of their own attractiveness than Chinese language responders. For the Chinese participants, experiencing an unstable sense of identity was associated with increased disordered eating and body dissatisfaction for men and women, respectively. Looking at the Chinese language participants specifically, ethnic identity search behaviors alone were associated with increased risk for the eating-related outcome variables. Results pertaining to the Chinese participants who responded in English yielded a surprising pattern. They were not different from Caucasians or their Chinese-responding counterparts for any of the body image and eating disorder measures, and there was no relationship between ethnic identity and either body dissatisfaction or disordered eating. These findings highlight the importance of allowing participants a language choice for methodological reasons, as well as to identify potential differences between language-based subsets of responders.

Introduction

Body image is a construct that has applications in several areas of psychology and medicine, including patients with neurological disorders leading to inaccurate perceptions of personal appearance, patients with noticeable physical deformities, individuals with pathological misperceptions about certain aspects of their appearance, as well as in eating disorder patients (Dorian & Garfinkel, 2002). In fact, the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM-IV*; American Psychiatric Association, 1994) requires the presence of body image disturbance for the diagnosis of both Anorexia Nervosa (AN), marked by food refusal due to fear of weight gain, and Bulimia Nervosa (BN), in which patients binge and purge in order to prevent weight gain. Consequently, this area has received much attention by researchers and clinicians, particularly regarding the role of culture in the onset and maintenance of body dissatisfaction.

It is typically understood that Western cultures value thinness in females and a more average body weight in males (Jackson, 2002). There is general support for this, as several ethnic minority groups of women in the United States have reported greater levels of body satisfaction than Caucasians, even though the minority women weighed more than their Caucasian counterparts (Jackson, 2002). For some time, it seemed as though cases of clinically significant body image disturbance and related eating disorder symptoms were restricted to Western countries, until more recently when cases of AN and BN began occurring in Eastern cultures, including Japan, Hong Kong, Taiwan, and Korea (S. Lee & Katzman, 2002).

Some, such as Hall (1995), attribute this phenomenon in Asian and Asian American women as a result of exposure and acculturation (transitioning from one's native culture to those of a new, dominant culture) to Western values. Hall (1995) suggests that Asian and Asian American women are "doubly oppressed" (p. 10) as victims of sexism and racism, and may engage in eating disordered behaviors to compensate for their lack of power in other areas. There is some empirical support for

this view, as Stark-Wroblewski, Yanico, and Lupe (2005) found that awareness and internalization of Western appearance values in Japanese and Chinese women were positively correlated to eating pathology. However, Lester (2004) cautions against interpreting such findings as evidence of a causal relationship between Westernization and eating disorders, as research in this area often is based on flawed assumptions of culture itself.

For example, blaming Westernization for problems with body image in other cultures assumes that all other cultures are limited to their respective countries of origin, while Western ideals transcend cultures and countries around the world (Lester, 2004). Culture is often used interchangeably with location without regard for the customs and values associated with the given geographic region (Katzman & Lee, 1997). Current measures of acculturation address the context and processes related to social referencing, but not actual cultural influences (Lester, 2004). Additionally, using the assumption of Western culture's transcendence as an explanation for eating disorders in non-Western areas implies that eating disorders and Western culture are both evidence of and an explanation of each other. As a result, "culture becomes something of a catchall term for anything not strictly psychological or biological, and as a way of displacing concerns that might otherwise require a more profound examination of the cultural bases of the diagnostic criteria themselves" (Lester, 2004, p. 609). This account of eating disorders assumes that Western ideals are the primary contributors to the expression of eating disorders, without actually specifying which values create the psychological conflict (Katzman & Lee, 1997).

Critics of the Westernization model point to discrepancies in symptom presentation of eating disorders in Western and non-Western cultures as evidence of the model's failure to adequately capture the role of culture in the onset and maintenance of the disorders. Central to the diagnosis of AN and BN is the presence of body image dissatisfaction (American Psychiatric Association, 1994). Historically, however, numerous examples of self-starvation have been documented in which there is

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no evidence of weight concern or appearance dissatisfaction. A review of such historical cases revealed that starvation was often self-imposed for the sake of religious piety, with female adolescents attempting to model themselves after saints (Keel & Klump, 2003). Furthermore, research on the lives of saints indicates that 170 of these religious figures displayed symptoms of eating pathologies which "involved food refusal resulting in emaciation overtly motivated by the belief that this reflected divine intervention" (Keel & Klump, 2003, p. 752). This holy anorexia was experienced by saints such as St. Catherine of Siena and St. Veronica, whom many females were encouraged to model. Though there are relatively few historical cases involving binge eating, it appears that binge episodes were followed by periods of food restriction, rather than purging, perhaps to repent for the sin of gluttony, rather than to prevent weight gain (Keel & Klump, 2003).

Current research also refutes the notion that body image dissatisfaction and weight concern must be present in eating disordered patients, particularly in Asian cultures. One body of literature has focused on differentiating between types of AN. Researchers identified AN patients in Hong Kong as being either fat phobic (FP), in which food refusal is a direct consequence of fear of weight gain, and non-fat phobic (NFP), in which food refusal is not related to weight or body shape concern (S. Lee, Ho, & Hsu, 1993). NFP patients identified reasons such as stomach bloating, lack of appetite and fear of food as reasons for food refusal. The only clinical differences found between the two groups were that the NFP patients were underweight before the onset of the disorder and they demonstrated fewer BN behaviors compared to the FP patients (S. Lee et al., 1993). Other studies have reported similar findings, with Chinese NFP and FP patients differing only on motivation for thinness (L. L. S. Lau, Lee, Lee, & Wong, 2006; S. Lee, Lee, Ngai, Lee, & Wing, 2001; S. Lee, Lee, & Leung, 1998), and the tendency for NFP individuals to be underweight prior to the onset of AN (S. Lee et al., 2001).

Various explanations for the dichotomous presentation of weight concern in Asian eating disordered patients have been put forth. Some have suggested that the fear of gaining weight could be concealed by the patient (S. Lee et al., 2001; S. Lee et al., 1993), although it does not explain why this would be so much more common in non-Western cultures (S. Lee et al., 1993). It is also possible that the core features have evolved since the early 20th century, resulting in FP and NFP subtypes (S. Lee et al., 1993). Another explanation is that FP represents true AN, while NFP is an atypical form of the disorder. S. Lee and colleagues (1993) argue that this is the most ethnocentric account, since it assumes that body image disturbance as seen most often in Western cultures is the predominant symptom of AN, despite the otherwise similar clinical presentation in individuals without this symptom. Given that the NFP form of AN is common in Asian cultures, it would be beneficial to reconsider the current diagnostic criteria's emphasis on weight and shape concern to develop a broader cross-cultural definition (S. Lee et al., 1998; L. L. S. Lau et al., 2006).

Body Image in Asian Cultures

Researchers have noted the presence of a desire for thinness and fear of obesity among Asian females, despite the fact that they are often considered underweight by Western standards (e.g., S. Lee, 1993). A survey of Chinese undergraduates revealed that 78% of women endorsed fear of fat, as well as a preference for fasting as a weight control method (Chun et al., 1992). Similar trends of fear of fat, weight control appeal, and overall body dissatisfaction have also been demonstrated in Chinese adolescent females (A. M. Lee & Lee, 1996). Such findings are in contrast to traditional Asian views of overweight as attractive, and a symbol of prosperity and health (Kawamura, 2002).

The emphasis on thinness appears to have been pervasive throughout Asian history, as is exemplified by accounts of Chinese harems starving themselves to gain the emperor's approval, the fact that most classic Chinese beauties are known for their tiny waists and fragility, as well as the practice of waist binding among women (as reported in Leung, Lau & Sze, 2001). In addition to

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historical accounts, recent empirical evidence supports thinness as an Asian cultural ideal (Leung et al., 2001). Researchers analyzed the height, weight and body measurements from the Miss Hong Kong beauty pageant contestants from 1975 to 2000. Starting in 1990, residents were able to vote for contestants, meaning that winners would reflect common standards of attractiveness. Data was also analyzed for contestants selected for the title of Miss Photogenic, chosen by editors and photographers of popular magazines. Results showed that contestants' overall body mass index (BMI) decreased over time, though this was because contestants and winners became taller. Actual weight did not change. Pageant and Miss Photogenic winners always had lower BMIs than the typical Hong Kong female, indicating that height and thinness have been preferred in this Asian culture for quite some time (Leung et al., 2001).

Despite this preference for thinness, some literature suggests that eating disorders may not be a serious issue in Asian cultures. Though Chinese undergraduates reported a fear of being fat, they did not report dieting behaviors, suggesting that current body shape (which was thin overall) is a greater influence on likelihood of dieting than ideal body shape (S. Lee, 1993), though dieting is associated with greater body dissatisfaction (S. Lee, Leung, Lee, Yu & Leung, 1995). Researchers posit that the strength of the desire for thinness is mediated by obesity. As prevalence rates of obesity are generally lower in Asian populations (e.g., prevalence rates of 7.2% and 3.8% for Malaysian women and men, respectively; Ismail et al., 2002), this may explain why Chinese women in Hong Kong place similar emphasis on thinness as Western women, but do not engage in chronic dieting to the same degree (S. Lee, 1993).

Even if Chinese females are protected to a certain degree from eating disordered behaviors, they still exhibit body dissatisfaction, believing their lower bodies to be too heavy, wanting to weigh less (though not currently overweight), wanting thinner thighs, waists, and hips, and desiring bigger breasts (S. Lee et al., 1995). A. M. Lee and Lee (1996) indicate that body dissatisfaction is a

predictor of disordered eating among Chinese female adolescents. In a sample of Chinese undergraduate females in Singapore, 7.4% of the participant pool was found to be at risk for eating disorders, (Ho, Tai, Lee, Cheng & Liow, 2006). While it has been suggested that body dissatisfaction mediates the relationship between exposure to Western values and disordered eating (Mumford, Whitehouse, & Choudry, 1992), it cannot be assumed that adherence to non-Western cultural values alone protects individuals from developing body image dissatisfaction.

Body Image and Acculturation among Asians

Some studies have found fewer cross-cultural differences in body image than expected. For example, Cachelin and Regan (2006) examined a multi-ethnic sample of women and men living in the United States. Results showed that high levels of dietary restriction were less common among Asian Americans than other ethnic groups, but that these ethnic differences were only present in women. Female chronic dieters were more acculturated to American values, which may support the Westernization model of eating-related pathology, though a causal relationship between acculturation and dieting cannot be assumed (Cachelin & Regan, 2006). Additionally, while different ethnicities displayed different rates of dieting, psychological profiles of dieters were consistent across ethnicities, with dieters reporting greater depression, lower self-esteem, greater body distortion levels, and more disordered eating (Cachelin & Regan, 2006).

Another study on a multi-ethnic U.S. sample of ninth grade girls and boys found similar results (Nishina, Ammon, Bellmore, & Graham, 2006). There were minimal ethnic differences among boys. For girls, only African Americans were significantly different, reporting more body satisfaction than all other groups, and more weight satisfaction than Asian Americans (Nishina et al., 2006). Based on the results of a study of body-size preference in a community sample of men and women and controlling for variables such as age, education, and weight, researchers concluded that

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ethnicity alone is not a factor in male or female figure preferences (Cachelin, Rebeck, Chung & Pelayo, 2002).

The results of studies, such as the ones described above, suggest that, at least across ethnicity alone, there are more similarities in body image-related issues than differences. However, ethnicity does not necessarily imply adherence to traditional cultural norms and values. In order to better understand the relationship between body image and cultural identification among Asians, researchers have measured constructs such as acculturation and ethnic identity in populations of Asians residing in both native and Western cultural contexts. The following sections summarize the results and implications of several of these studies.

Asian Acculturation to Traditional Cultural Values. Despite the assertion that adherence to traditional Asian cultural values may serve as a protective factor against disordered eating and body dissatisfaction, there is evidence to suggest that this is not always the case. For example, Ho et al. (2006) found that speaking English at home was not associated with increased risk, though speaking Malay at home was a significant risk factor for eating disorders. Among Asian American undergraduate females, greater acculturation to traditional Asian values was associated with increased body dissatisfaction (A. S. M. Lau, Lum, Chronister, & Forrester, 2006). Studies of children have found relationships between acculturation and eating attitudes consistent with those observed by A. S. M. Lau et al. (2006). One such study on nine year old Asian and Caucasian girls revealed that Asian girls had higher dietary restraint than Caucasians (Hill & Bhatti, 1993). Though there was no relationship between Western acculturation and dietary restraint, those Asian girls who reported a more traditional cultural orientation were higher restrainers than the Asians who were less traditional (Hill & Bhatti, 1993).

More recently, Soh and colleagues (2007) studied North European Australian, East Asian Australian, Singaporean Chinese and Australian expatriates in Singapore eating disordered and non-

disordered individuals on eating pathology. Differences in eating disorder symptoms were found between control groups, with Singaporean Chinese women showing higher levels of eating disorders than the other control groups and greater restraint than the Australian expatriates, though they reported the lowest degree of Western cultural orientation than any of the other control and eating disorder groups (Soh et al., 2007). Similar results were found in a study of body image among the same participants (Soh et al., 2008). Singaporean Chinese women reported greater body image dissatisfaction than the Australian control groups and expatriates. This body image disturbance was so severe that there was no difference between the scores of Singaporean Chinese and the eating disorder groups, even after controlling for acculturation, suggesting that there are other sociocultural factors that are more influential on the presence of eating disorder symptoms than body image dissatisfaction (Soh et al., 2008).

Asian Acculturation to Western Values. Research investigating the relationship between acculturation to Western ideals and disordered eating behaviors and attitudes has produced mixed findings. Some studies appear to support the Westernization model of eating disorders, finding that increased acculturation to Western values is associated with disordered eating and body dissatisfaction. For example, in addition to the findings of Soh et al. (2007) described above, results also indicated that greater Western acculturation was related to higher restraint and disordered eating. A. S. M. Lau et al. (2006) found a positive correlation between internalization of Western media attractiveness ideals and body image disturbance. Similarly, A survey of Chinese students attending universities in the United States on eating attitudes, Western acculturation and other factors found that women who scored high on the acculturation measure demonstrated a greater appearance-related drive for perfection than their less acculturated peers, and reported feeling more ineffective than less acculturated participants (Davis & Katzman, 1999).

Among children, similar patterns have been reported. High school girls in three different locations in China, ranging from urban to rural, were assessed on body image and eating attitudes (S. Lee & Lee, 2000). Students from Hong Kong, the most urban location, reported more body dissatisfaction and made up the largest percentage of high-scoring participants on an eating disorder measure when compared to students from rural Hunan and Shenzhen (a modernized area of China, though less modernize than Hong Kong). It is possible, however, that Westernization is not responsible for these types of differences, as much as modernization (S. Lee & Lee, 2000). A study on Pakistani children found a positive correlation between exposure to dieting methods and behaviors with eating disordered behaviors and body image dissatisfaction (Mumford et al., 1992). Results also showed that higher Western acculturation scores were associated with greater levels of eating-related psychopathology. Interestingly, the Pakistani children had more such pathology than Caucasian children in England and there was a higher prevalence of BN in the Pakistan sample compared to a sample of Asians residing in England (Mumford et al., 1992).

Despite such support for the negative effects of Western acculturation, there is some evidence to suggest that such acculturation is associated with reduced levels of disordered eating and body dissatisfaction among Asians. Results from research conducted in a multiethnic sample of immigrants to the United States indicated that ethnicity moderated the effects of acculturation on body image and disordered eating, as greater acculturation resulted in lower levels of pathology for Chinese immigrants (Sussman et al., 2007). A study on eating attitudes among Chinese students from Hong Kong and Caucasian students in Australian universities did not find differences between ethnicities, though the Caucasian students scored lower on body image measures (Lake, Staiger & Glowinski, 2000). However, when Chinese participants were separated into groups based on acculturation, those who were less acculturated had significantly more disordered eating attitudes and lower body images than those who were highly acculturated to Western culture. When these groups

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were compared to the Caucasian group, the highly acculturated Chinese participants showed less disordered eating and higher body image ratings than the less acculturated Chinese students and the Caucasians. There were no statistical differences between the less acculturated Chinese students and the Caucasian students. It is unclear why those who are less acculturated to Western values show the greatest level of body image and eating attitude disturbance (Lake et al., 2000).

Such inconsistencies in the relationship between disordered eating and acculturation have led researchers to propose an alternate explanation for mixed findings in the literature. Reddy & Crowther (2007) failed to find a relationship between acculturation and either body dissatisfaction or disordered eating attitudes. However, cultural conflict, or perceived pressure from both Eastern and Western cultures, was found to be associated with both body image and eating attitude difficulties. Cultural conflict was also found to mediate the relationship between teasing and body image. In other words, ethnically-related teasing seems to worsen feelings of cultural conflict and increase the likelihood of conforming to American culture at the expense of the participants' traditional culture (Reddy & Crowther, 2007). Consistent with other studies of Asians living in Western cultures, research in Canada and Australia has found evidence of some degree of culture clash among Asian residents. Along the same lines, a study conducted among Canadian university students of Chinese, Indo-Asian, and Caucasian/European-descent students found that Caucasian students reported the highest body satisfaction while Chinese students reported the lowest levels of body satisfaction (Kennedy, Templeton, Gandhi & Gorzalka, 2004). Chinese participants tended to be more worried about their attractiveness and least satisfied with specific body parts when compared to the other ethnic groups. Compared to the other two ethnic groups, Chinese participants were more concerned with their facial attractiveness and height. Those Chinese students who had immigrated to Canada most recently had the lowest body image scores, suggesting that body image is low in Asia, or that

immigrants experience culture clash and are more vulnerable to the influence of the Western emphasis on thinness (Kennedy et al., 2004).

In summary, the relationship between acculturation and disordered eating and body image disturbance is unclear. While there is evidence to support the negative effects of Western acculturation on these constructs among Asians, literature also indicates that acculturation to traditional Asian values may have similar effects. Additionally, researchers have also found that Asians who are acculturated to Western values actually have greater body satisfaction and lower levels of disordered eating. This raises the possibility that adherence to Western values is a type of protective factor for these individuals. Further research in this area is needed to elucidate this relationship and provide guidance for the diagnosis and treatment of eating and body image disturbance among Asians.

Gender Differences among Asians

As is true of the literature on the relationship between acculturation and disordered eating and body image, the results of studies on gender differences among Asians regarding these constructs is characterized by mixed findings. Researchers have found patterns similar to those in Western samples, with females being more dissatisfied with their bodies than males. One such study (Mintz & Kashubeck, 1999) found that Asian American males had higher body satisfaction and lower levels of disordered eating than their female counterparts. Though this pattern was similar to that of a Caucasian sample, the differences between genders were smaller for the Asian Americans. Similarly, Kowner (2002) found that Japanese men had higher body esteem than Japanese women, and Liao et al. (2010) found that Chinese female medical students were at greater risk for eating disorders than their male colleagues.

Other studies have reported findings that deviate from this pattern. Barnett, Keel & Conscenti (2002), for example, found that Asian men reported more body dissatisfaction than females. Another

body of literature has reported finding no significant gender differences on a variety of eating and body image constructs in a variety of Asian populations, including disordered eating and fear of fat among Indians (Sjostedt, Schumaker & Nathawat, 2001), body esteem and desire to change physical attractiveness among Hmong men and women (Franzoi & Chang, 2002), and body image satisfaction and weight loss strategies among Malay adolescents (Mellor, Ricciardelli, McCabe, Yeow, bt Mamat & bt Mohd Hapidzal, 2010). When comparing different Asian subgroups, Yates, Edman & Arugette (2004) failed to find gender differences. Collectively, results from this line of research seem to indicate that if gender differences among Asians exist, they are not as pronounced as they are among Caucasians.

Cross-cultural Differences among Males

While much research on eating and body image disturbance is focused on females, attention is also paid to its presentation in males. One study found that Taiwanese men showed greater levels of body satisfaction than American and European men (Yang, Gray & Pope, 2005), while others have found no differences between Asian and Caucasian men in terms of reported body satisfaction (Mintz & Kashubeck, 1999), disordered eating (Mintz & Kashubeck, 1999; Barr, 1995), various dimensions of body esteem and desire to change physical attractiveness (Franzoi & Chang, 2002).

Much of the literature on differences between Asian and Caucasian males, however, suggests that Asian males experience more body dissatisfaction and disordered eating than Caucasian males. In adolescents, Asian boys have been shown to be more likely to have dieted in the past year, report a history of binge eating (Story, French, Resnick & Blum, 1995), exercise more and report greater levels of disordered eating (Neumark-Sztainer, Story, Falkner, Beuhring & Resnick, 1999) than Caucasians. Similarly, when compared to data collected from American adolescent males, Japanese boys had lower levels of perceived physical attractiveness (Lerner, Iwawaki, Chihara & Sorell, 1980). In another study, Neumark-Sztainer, Croll, Story, Hannan, French & Perry (2002) found that

Asian American boys had the lowest body satisfaction and the highest levels of chronic dieting and binge eating among all ethnic groups studied.

These findings also appear to extend to adults as well, with several studies reporting lower levels of body satisfaction among Asian men compared to Caucasian men (e.g., Frederick, Forbes, Grigorian & Jarcho, 2007; Edman & Yates, 2005). In examining specific subtypes of Asian men, researchers have found that Indian and Filipino men had more disordered eating than their Caucasian counterparts (Sjostedt, Schumaker & Nathawat, 2001; Edman & Yates, 2005). Looking at dimensions of body image, Barnett and colleagues (2001) found that Asian and Caucasian men share the same ideal body shape. While Caucasian men did not report a discrepancy between their current shape and their ideal shape, Asian men identified themselves as smaller than their ideal shape. Chinese men in Hong Kong have also shown lower scores on dimensions of body esteem, including physical attractiveness, upper body strength, and physical condition (Jung, Forbes & Chan, 2010).

There is evidence that body dissatisfaction in Asian men may be linked to muscularity. Grammas & Schwartz (2009) found that Asian males were less satisfied with their muscularity than were Caucasian males. Jung et al. (2010) found that although Chinese males were more satisfied with their muscularity than Americans, 75% reported being dissatisfied with their muscularity. It has been suggested that Asian men living among Caucasians may prefer to be more muscular in order to decrease their perceived deviation from typical Caucasian males (Barnett et al., 2002). It is also possible that among both Caucasian and Asian men, global body dissatisfaction and muscularity satisfaction are different constructs, as at least one study reports an absence of correlation between these body image dimensions (Jung et al., 2010). Given the inconclusiveness of current research on males and eating disorder-related constructs, further research is warranted to better understand the interactions of ethnicity, and eating and body satisfaction among men.

<u>Current Aims and Hypotheses</u>

In short, the literature on ethnic differences in the presentation of disordered eating and body image disturbance between Asian and Caucasian samples is unclear. In general, when Caucasians are found to have more eating-related pathology than Asian counterparts, differences are attributed to the influence of Western values. When no differences between ethnicities are found, or Asians demonstrate great pathology than Caucasians, it is more difficult for researchers to explain these findings, though the tendency has been to contextualize them in terms of Western culture.

Despite the mixed and inconclusive findings that characterize this body of literature, "the hypothesis that acceptance of Western values is largely responsible for the occurrence of eating disturbances and disorders among individuals of non-Western backgrounds remains remarkably resilient" (Rieger, Touyz, Swain & Beumont, 2001, p. 210). One aim of the current study is to evaluate this theory by comparing body image dissatisfaction and eating attitudes among Chinese and Caucasian adults attending universities in the United States. Based on research showing higher levels of eating disorder symptoms in Asian cultures than in Western cultures, in the current study it is expected that both male and female Chinese participants will display greater levels of body dissatisfaction and disordered eating, as well as lower body esteem than their Caucasian counterparts. Given the lack of clarity on the mechanisms underlying the anticipated between-group differences, efforts will be made to consider the results in a context that extends beyond the potential role of Western values.

Another aim is to investigate gender differences in body dissatisfaction and disordered eating. Given research indicating that females tend to display more of these symptoms than males, it is expected that both Chinese and Caucasian females will display greater levels of body dissatisfaction and disordered eating compared to their male counterparts.

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The final aim of this investigation is to assess the role that ethnic identity with one's native culture plays in the presentation of body image dissatisfaction and disordered eating behaviors among Chinese participants. Based on previous findings that stronger ethnic identity may increase vulnerability to such disturbances (e.g., Humphrey & Ricciardelli, 2004; Lau et al., 2006), it is expected that a greater sense of ethnic identity will predict greater levels of body image dissatisfaction and disordered eating.

Most studies investigating these constructs in samples of Asians living in Western cultures require that participants be able to complete survey measures in English (e.g., Davis & Katzman, 1998; Soh et al., 2007; Soh et al., 2008). Requiring all participants to be fluent in English presents two major problems when conducting cross-cultural research. First, participants who are not fluent in English are excluded. This may possibly result in a biased sample, as Chinese individuals who are fluent in English may be more acculturated to Western values. Second, it is difficult to determine degree of fluency; participants may have some level of fluency in English, but it is difficult know how well they understand the intended meaning of item content. In order to avoid these methodological issues, measures for this study were available in Simplified Chinese and English.

Methods

Participants

To be eligible for the study, participants were required to be at least 18 years old. Caucasian participants were recruited through the undergraduate psychology research pool at a large Southeastern university in the United States, and received course credit for completing the entire study. Chinese participants were recruited from over 100 colleges and universities throughout the United States. Emails were sent to the leaders of university-based Chinese student organizations (e.g., Chinese Students and Scholars Association) explaining the nature of the study, and requesting that they forward the study survey link to other members of their organization. Participants recruited in this manner did not receive any form of compensation. As the survey measures were available in both English and Simplified Chinese, fluency in English was not a requirement for participation.

A total of 705 individuals participated in the study between August, 2010 and February, 2011. Of those, 55.9% were Caucasian (n=394), 27.2% were Chinese (n=192), and the remaining 17% consisted of participants from various other ethnic backgrounds (n=119), including Asian (n=9), Asian American (n=13), Chinese American (n=8), African American (n=36), Hispanic/Latino (n=10), American Indian (n=2), mixed background (n=24), or did not report enough information to be categorized into a specific ethnic group (n=10). For the purpose of this research, only Chinese and Caucasian participants were included in analyses resulting in a sample size of 586 participants (67.2% Caucasian, 32.8% Chinese).

Measures

Demographic Questionnaire. This questionnaire consists of questions regarding participants' age, gender, ethnicity, and length of residency in their current location.

Multigroup Ethnic Identity Measure (MEIM; Phinney, 1992; Roberts et al., 1999). This is a 12-item self-report questionnaire designed to measure ethnic identity based on aspects common to all

ethnic groups, specifically identity achievement, affirmation and belonging, and ethnic behaviors. Factor analysis has revealed two subscales, Ethnic Identity Search (EIS) and Affirmation, Belonging and Commitment (ABC; Roberts et al., 1999) The EIS subscale is based on the developmental theory of ethnic identity, according to which an individual must go through an exploration phase of learning about and becoming involved with one's ethnic group before experience a stable identity as member. The ABC is based on social identity theory, and evaluates the degree of an individual's commitment to their ethnic group, and the positive feelings associated with it (Roberts et al., 1993). Respondents rate their agreement with each item on a Likert scale from 1, indicating strong disagreement, to 4, indicating strong agreement (Phinney, 1992). The MEIM has shown adequate reliability, with Chronbach's alphas of .81 for high school students and .90 for college students (Phinney, 1992). Construct validity has also been demonstrated (Ponterotto et al., 2003) in United States samples of various ethnic groups, and has been used in Korean Chinese individuals (R. M. Lee, Falbo, Doh & Park, 2001). The MEIM was included in the current study to evaluate the degree of identity with ideals and beliefs associated with one's identified ethnic group.

Body Shape Questionnaire (BSQ; Cooper, Taylor, Cooper & Fairburn, 1987). The BSQ is a 34-item self-report measure that assesses severity of body shape concerns. Participants rate the frequency of their body concerns on a 6 point Likert scale, with responses ranging from "never" to "always" (Cooper et al., 1987). Scores on the BSQ are correlated with other measures of body concern and eating attitudes and behaviors (Cooper et al., 1987; Rosen, Jones, Ramirez & Waxman, 1996). Women who describe themselves as weight-concerned are more likely to score higher on the BSQ than women who do not experience such concern. It has excellent reliability (Chronbach's alpha of .97 among females; Pook, Tuschen-Caffier, & Brahler, 2008), and concurrent and discriminant validity of the BSQ have been demonstrated in community and clinical samples of female patients with AN and BN (Cooper et al., 1987). The BSQ has been shown to have internal

reliability among a community sample of males (Chronbach's alpha of .96; Russell & Keel, 2002). The BSQ has been used in samples of Asian women and girls in Britain (e.g., Wardle et al., 1993; Ogden & Elder, 1998). In this study, the BSQ was used as an indicator of overall body image dissatisfaction.

Body Esteem Scale (BES; Franzoi & Shields, 1984). This self-report measure consists of 35 items, for which participants rate their feelings, ranging from strongly negative to strongly positive, about specific body parts and other appearance-related aspects on a 5-point Likert scale (Franzoi & Shields, 1984). The BES has been established as reliable and valid for both males and females, and measures three dimensions of body esteem in each gender. Female body esteem is evaluated by the components Sexual Attractiveness, Weight Concern, and Physical Condition (with reliability coefficients of .78, .87 and .82, respectively). Male body esteem is measured on the components Physical Attractiveness, Upper Body Strength, and Physical Condition (with reliability coefficients of .81, .85, and .86, respectively; Franzoi & Shields, 1984). Adequate convergent and discriminant validity has been shown for all three female subscales and the male Upper Body Strength and Physical Condition subscales (Franzoi & Herzog, 1986). A translated version of the BES has been used in a sample of Chinese students in Hong Kong and in the United States (Davis & Katzman, 1998). The BES was included in the present investigation to evaluate the degree to which participants experience positive feelings associated with various dimensions of appearance.

Eating Attitudes Test (EAT-26; Garner et al., 1982). The EAT-26 is a self-report measure that will be used to assess the presence of eating disorder symptoms. Questions on this 26-item questionnaire assess three factors: dieting, bulimia and food preoccupation, and oral control. The EAT-26 has been shown to be reliable and valid, with Chronbach's alphas of .83 for female undergraduates, and .90 for anorexic women (Garner et al., 1982). Scores of 20 and greater have been associated with diagnoses of Anorexia Nervosa, as well the presence of other eating disorders

(Garner et al., 1982). The EAT-40 (Garner & Garfinkel, 1979) scores of bilingual Hong Kong students was found to have similar factor structure to those found in Western samples (S. Lee, 1993; see Appendix E). The EAT-26 was utilized in the current study to measure the degree to which participants engaged in disordered eating behaviors and beliefs.

Procedure

The measures described above were each translated to Chinese using back-translation based on the guidelines provided by Grunwald and Goldfarb (2006). The initial translation from English to Simplified Chinese was made by a native Chinese graduate student fluent in both languages. The measures were then translated back to English by a translator fluent in both languages, who was independent of the study and unaware of the content of the measures. Two of the experimenters then reviewed the back-translated versions for readability and to insure the content of the measures was unchanged. Based on these revisions, the translator then translated the measures back into Chinese.

The survey was administered through SurveyMonkey, a secure online survey engine. No identifying information, including IP address, was collected. Participants receiving course credit were identified by randomly generated identification numbers assigned to them when they enrolled in the study. Once participants selected the survey link, they were asked to indicate if they were more fluent in English or Simplified Chinese. The remainder of the survey, including consent documents, was administered in the chosen language. The entire survey took approximately 30 minutes to complete. One advantage of utilizing an online survey design is that participants are prompted to complete missing items before moving on to the next page of the survey. As a result, all measures included in analyses were complete. Participants who did not complete a given measure were excluded from relevant analyses on the measure.

Principal Components Analyses of Body Image and Eating Disorder Measures

In order to determine whether the factor structures of the BSQ and EAT-26 in the current Caucasian and Chinese samples are comparable to those that have been previously reported, principal components analyses were conducted for each of these measures. For each measure, separate analyses were conducted for Chinese and Caucasian participants.

Body Shape Questionnaire. Two of the items on the BSQ regarding vomiting and laxative use were not included in the principal components analyses, and responses from participants who endorsed either of these behaviors were removed from the analyses, as individuals who engage in such behaviors may not be representative of a non-clinical sample. Therefore, 32 (as opposed to 34 items) were analyzed (BSQ-32).

For Caucasians, the principal components analysis initially revealed three factors. Analyses of the scree plot suggested that a one or two solution factor may be more appropriate. Orthogonal (Varimax) rotation was performed to evaluate both of these models. Items with factor loadings of .32 and above were retained, based on criterion recommendations by Tabachnick and Fidell (2006).

The two factor solution accounted for 63% of the variance. Items were distributed between the two factors in a way that did not make conceptual sense. The one factor solution accounted for 57% of the variance, and appeared to be a better fit. All 32 items were retained based on the strength of their factor loadings.

Chronbach's alpha was conducted for the BSQ-32, as well as for the full 34 item version (BSQ-34). Results indicated acceptable reliability for females and males on both versions (all above .96), and are summarized in Table 1.

The initial principal components analysis of the BSQ-32 revealed five factors for Chinese participants, with the first factor accounting for most of the variance. The scree plot indicated that a maximum of two factors existed. Varimax rotation was performed to evaluate both the one and two

20

factor solutions. As with Caucasians, items with factor loadings of .32 and above were retained. Only one item did not meet this criterion, and was removed (" have you worried about your flesh not being firm enough?"), resulting in a 31 item version of the measure (BSQ-31). The two factor solution accounted for 53% of the variance, and as with the Caucasian sample, there was no conceptual basis for item distribution between the factors. The one factor solution, accounting for 46% of the variance appeared to be the best fit.

Reliability analyses were conducted for the BSQ-34, the BSQ-32 (with items relating to vomiting and laxative use excluded) and the BSQ-31 solution that was derived from the current Chinese sample. Chronbach's alpha was greater than .90 for males and females on all BSQ versions. Values are reported in Table 1. There was no difference in reliability between the 31 item version and the 32 item version.

Table 1. Comparison of Chronbach's alpha for variations of BSQ versions among Caucasian and Chinese participants

| Version | Caucasian | | Chinese | |
	Females	Males	Females	Males
BSQ-34	.972	.965	.969	.950
BSQ-32	.975	.967	.971	.919
BSQ-31	-	-	.971	.919

Note. BSQ=Body Shape Questionnaire; BSQ-34= original BSQ scale developed by Cooper et al, (1984); BSQ-32= BSQ with items about vomiting and laxative use removed for exploratory factor analysis in the current study; BSQ-31= BSQ version derived from results of exploratory factor analysis for the Chinese sample.

Principal components analyses for the Chinese and Caucasian samples support a one factor solution for the BSQ, which is consistent with findings in previous studies (Pook, Tuschen-Caffier, & Stich, 2002; Ghaderi & Scott, 2004). Given that the reliability was only minimally improved when using other versions (32 items and 31 items) in these samples, and to make findings of the present

study directly comparable to other investigations using the BSQ rather than a modified version, hypotheses tests were conducted using the results of the original 34 item version. Factor loadings for the BSQ-32 and BSQ-31 for Chinese and Caucasians are reported in Appendix A.

Eating Attitudes Test-26. Seven factors emerged after conducting principal components analysis of the EAT-26 for the Caucasian sample, while scree plots indicated a three or four factor solution. Consistent with the original factor analysis of this measure (Garner et al., 1992), oblique rotation was used to evaluate both possible solutions (specifically, Promax rotation). Again, items with factor loadings of at least .32 were retained.

The three factor solution accounted for 47% of the variance. Items loading onto the first factor were related to dieting behaviors, while the third factor contained items addressing food preoccupation. Items on the second factor, however, were not conceptually linked, and included items related to eating behaviors (e.g., "I vomit after I have eaten," and "I display self-control around food") as well as others' perceptions about food/eating (e.g., I feel that others would prefer if I ate more"). Two items did not load onto any factor ("I enjoy trying new rich foods," and "I take longer than others to eat my meals"). The four factor solution, accounting for 53% of the variance appeared to be a better fit from a conceptual standpoint. The factors were Dieting (31% of the variance; contained different items than the Dieting subscale identified by Garner et al., 1992), Food Behaviors and Avoidance (10% of the variance), Preoccupation with Food (6% of the variance), and Others' Perceptions (5% of the variance). All items from the EAT-26 were retained in this solution. Factor loadings for items within each subscale are presented in Appendix B.

Chronbach's alpha was calculated for the EAT-26, as well as the three subscales identified by Garner and colleagues (1992): Dieting, Bulimia and Food Preoccupation, and Oral Control. The reliability statistic was also calculated for the four factors, described above, that were identified in this Caucasian sample. Reliability for the EAT-26 was high for women (α=.90) and somewhat lower

for males (α=.75). Both Dieting subscales had higher reliability for females and males than the other subscales. The other subscales ranged from alphas of .67 to .90 for females, and .33 to .78 for males. Exact values of Chronbach's alpha are reported in Table 4.

For the Chinese sample, principal components analysis initially identified eight factors, while the scree plot suggested a three or four factor solution. Promax rotation was used to evaluate each of these potential iterations. Items with factor loadings less than .32 were removed. The four factor solution accounted for 48% of the variance. While items loading onto the first factor were related to dieting behaviors, the distribution of items on the other three factors did not make conceptual sense.

The three factor solution accounted for 42% of the variance. Six items that did not load highly onto any factor were removed, resulting in a three factor solution that accounted for 53% of the variance. These factors were labeled Dieting and Food Preoccupation (33% of the variance), Awareness of Food Content (10% of the variance) and Vomiting and Concern from Others (9.5% of the variance). Factor loadings for individual items within the subscales derived from the Chinese sample are reported in Appendix C.

Reliability analyses were conducted for the EAT-26, the original EAT-26 subscales (Dieting, Bulimia and Food Preoccupation, and Oral Control), as well as for the 20 item EAT (EAT-20) and related subscales identified in the current sample of Chinese participants. Chronbach's alpha for the EAT-26 was greater than .80 for both males and females. Reliability for the EAT-26 subscales were not as high, ranging from alphas of .27 to .83 for females, and alphas of .51 to .76 for males. Reliability for the EAT-20 was slightly better than for the EAT-26. Chronbach's alphas for the EAT-20 subscales were also better than the EAT-26 subscales, though still not ideal, ranging from .37 to .89 for females, and from .68 to .89 for males. Results of the reliability analyses are summarized in Table 2.

Principal components analyses of the EAT-26 in Caucasian and Chinese samples utilized in this study yielded different factor structures, neither of which is consistent with the three factors

Table 2. Comparison of Chronbach's alpha for variations of EAT versions among Caucasian and Chinese participants

Version	Caucasian		Chinese	
	Females	Males	Females	Males
EAT-26[a]	.904	.750	.832	.803
EAT-26 Diet[a]	.894	.779	.831	.763
EAT-26 Bulimia[a]	.733	.631	.721	.746
EAT-26 Oral Control[a]	.694	.433	.274	.509
EAT-26 Diet-R[b,c]	.905	.777	-	-
EAT-26 Food[b,c]	.690	.335	-	-
EAT-26 Preoccupation[b,c]	.668	.549	-	-
EAT-26 Perception[b,c]	.774	.715	-	-
EAT-20[b,d]	-	-	.866	.854
EAT-20 Diet,[b,d]	-	-	.890	.896
EAT-20 Awareness[b,d]	-	-	.711	.686
EAT-20 Vomiting[b,d]	-	-	.370	.687

Note. EAT= Eating Attitudes Test; EAT-26= 26 item Eating Attitudes Test; EAT-Diet= Eating Attitudes Test Dieting subscale; EAT-Bulimia= Eating Attitudes Test Bulimia & Food Preoccupation subscale; EAT-Oral Control= Eating Attitudes Test Oral Control subscale; EAT-26 Diet-R= Eating Attitudes Test Revised Dieting subscale; EAT-26 Food= Eating Attitudes Test Food Behaviors and Avoidance subscale; EAT-26 Preoccupation= Eating Attitudes Test Food Preoccupation subscale; EAT-26 Perception= Eating Attitudes Test Others' Perceptions subscale; EAT-20= 20-item Eating Attitudes Test; EAT-20 Diet= Eating Attitudes Test Dieting and Food Preoccupation subscale; EAT-20 Awareness= Eating Attitudes Test Awareness of Food Content subscale; EAT-20 Vomiting= Eating Attitudes Test Vomiting and Concern subscale.
[a] Scale and subscales originally reported by Garner et al. (1992).
[b] Scale and subscales derived based on the results of exploratory factor analysis using samples in the current study
[c] Subscales derived from data reported by the Caucasian sample.
[d] Subscales derived from data reported by the Chinese sample.

identified by Garner et al. (1992). This is not necessarily surprising, as other researchers have failed to replicate this factor structure. Koslowsky et al. (1992) found a four factor solution to a 20 item version of the EAT (Dieting, Oral Control, Awareness of Food Content, and Food Preoccupation),

while confirmatory factor analysis has identified four factors to a 16 item version (Self-perception of Body Shape, Dieting, Awareness of Food Content, and Food Preoccupation; Ocker, Lam, Jensen, & Zhang, 2007). Such findings suggest that the factor structure of the EAT-26 is unclear, and that interpretation of subscales should be done cautiously.

For the current study, since reliability for the measure in all groups was generally adequate, and in order to directly compare the Chinese and Caucasian samples, the original EAT-26 was used to conduct relevant hypotheses tests. Use of the standard version also allows for these results to be compared to those of other investigations utilizing this measure. The original three EAT-26 subscales were included in some of the analyses for exploratory purposes.

Hypotheses Testing

To test the first and second hypotheses (ethnic and gender differences in body image and disordered eating), three multivariate analyses of covariance (MANCOVAs) were utilized. For all MANCOVAs, age was entered as a covariate to control for the statistically significant age difference between ethnic groups (described below). Significant multivariate tests were followed with univariate analyses. Rather than using ethnicity (either Caucasian or Chinese) as the independent variable, an ethnicity-language variable was created in order to capture potential differences between Chinese participants who completed the survey in Chinese and those who completed it in English. This variable, therefore, consists of three groups: Caucasians (all of whom completed the surveys in English), Chinese who completed them in Chinese (CC), and Chinese who completed the measures in English (CE).

The first analysis examined the effects of gender and ethnicity-language category (the independent variables) on overall disordered eating behaviors and body shape dissatisfaction, with BSQ total scores, EAT-26 total scores, and EAT-26 subscales (EAT-dieting, EAT-bulimia and EAT-

oral control) entered as dependent variables. Higher scores on both measures are associated with greater levels of body dissatisfaction and disordered eating symptoms, respectively.

The second and third analyses examined the effects of gender and ethnicity on specific body esteem dimensions measured by the BES. Since these dimensions are measured by gender-specific subscales, separate MANCOVAs were conducted for males and females. For females, ethnicity-language category was entered as the predictor, and the female subscales of the BES as dependent variables: sexual attractiveness (SA), weight concern (WC) and physical condition (PC). For males, ethnicity-language category again was used as the predictor variable, with the BES male subscales as dependent variables: upper body strength (UBS), physical attractiveness (PA) and physical condition (PC). Higher scores on each subscale indicate greater levels of body esteem.

To test the third hypothesis, that ethnic identity predicts disordered eating and body dissatisfaction among Chinese participants, a series of forward sequential regressions were conducted. Results of analysis of assumptions led to the logarithmic transformation of several variables: BSQ total score, EAT-26 total score, and MEIM Ethnic Identity Search (EIS) score. For each regression analysis, the EIS and Affirmation, Belonging, and Commitment (ABC) subscales were predictor variables. EIS was tested in the first step, with EIS and ABC tested in the second step. To test the effects of ethnic identity on body image dissatisfaction and disordered eating, total BSQ and EAT-26 scores were used as dependent variables in their respective regressions. To determine if the relationships between predictor and dependent variables differ for males and females, separate regressions were run for each gender. In total, four regression analyses were conducted: BSQ totals regressed onto EIS and ABC scores for females, BSQ totals regressed onto EIS and ABC scores for males, EAT-26 totals regressed onto EIS and ABC scores for females, and EAT-26 totals regressed onto EIS and ABC scores for males.

Because it is possible that Chinese participants completing the study in Chinese differed from those completing it in English, separate forward sequential regression analyses were conducted for CC and CE participants. Again, EIS was tested in the first step as a predictor, with EIS and ABC entered in the second step. BSQ and EAT-26 total scores were again used as dependent variables. As with the initial set of regressions, separate analyses were run for males and females. Thus, an additional eight regressions were run: BSQ totals regressed onto EIS and ABC scores for CC females, BSQ totals regressed onto EIS and ABC scores for CC males, BSQ totals regressed onto EIS and ABC scores for CE females, BSQ totals regressed onto EIS and ABC scores for CE males, EAT-26 scores regressed onto EIS and ABC scores for CC females, EAT-26 scores for CC males, EAT-26 scores regressed onto EIS and ABC scores for CE females, and EAT-26 scores regressed onto EIS and ABC scores for males. In each case, analysis of assumptions was performed, and variables were transformed when appropriate (as suggested by Tabachnick and Fidell, 2006).

Results

<u>Participants</u>

All of the Caucasian participants completed the survey in English (*n=394*) while the majority

of Chinese participants completed it in Chinese (CC; *n=144*). A small group of Chinese participants

completed the survey in English (CE; *n=48*). Collectively, Chinese participants were significantly

older (*M=26.72 ±6.75*) than Caucasian participants (*M=20.24±3.99*), *t(245)=-12.06*, *p<.001*. CC

(*M=26.41±6.87*) and CE (*M=27.65±6.36*) did not differ in terms of age.

Of the total sample, 347 participants were female and 231 were male. There was no

significant age difference between males and females (*p=.16*). Univariate analyses indicated that

within both ethnicities, age difference between genders was non-significant, (*p=.949*).

Table 3 describes the length of residency in the United States for Caucasians, CC and CE

participants. Most Caucasian participants reported that they had always lived in the United States

(86%), while most Chinese participants had lived in the United States between one and seven years.

Table 3. Length of residency in the United States among Caucasian, CC, and CE participants

	Caucasian		CC		CE	
Time in United States	*N*	%	*N*	%	*N*	%
Less than 1 month	-	-	9	6.3	-	-
1 to 3 months	-	-	15	10.4	3	6.3
4 to 6 months	-	-	16	11.1	4	8.3
7 to 9 months	1	.3	2	1.4	-	-
10 to 12 months	-	-	7	4.9	1	2.1
1 to 3 years	-	-	56	38.9	13	27.1
4 to 7 years	2	.5	22	15.3	14	29.2
8 to 10 years	3	.8	4	2.8	3	6.3
More than 10 years	50	12.7	5	3.5	7	14.6
I have always lived in this country	338	85.8	2	1.4	1	2.1
Missing	-	-	6	4.2	2	4.2
Total	394	100	144	100	48	100

<u>Note</u>. CC= Chinese participants who completed the survey in Chinese; CE=Chinese participants who
completed the survey in English; - = No participants endorsed this item.

Summary of Scores on Body Image, Body Esteem, and Eating Measures

Table 4 displays the means and standard deviations of participant scores on the BSQ, EAT-26, and BES subscales for males and females. Because the Caucasian sample was drawn from a single university, there is a concern that this group may not be representative of the larger population. In order to conceptualize how this study's Caucasian sample, as well as Chinese sample, compares to samples used in other research, means and standard deviations of BSQ, EAT-26 and BES previously reported in research were gathered. Appendices D and E compare those values to those found in the current study for females and males, respectively. In general, scores found in the current study are comparable to those found in similar studies.

Ethnic and Gender Differences on Body Shape Dissatisfaction and Disordered Eating

To test for between-group differences on body image dissatisfaction and disordered eating, a two-way MANCOVA was conducted, in which gender and ethnicity-language category were entered as independent variables and BSQ total score, EAT-26 total, EAT-diet, EAT-bulimia, and EAT-oral control were entered as dependent variables, while controlling for the effects of age. Multivariate analysis revealed that the main effect of ethnicity-language was non-significant ($p=.336$). There was a significant main effect of gender, Wilks' lambda$=.936$, $F(4,550)=9.463$, $p<.001$, partial eta$^2=.064$. Follow-up univariate tests indicated that there were significant differences between genders on all outcome variables: BSQ total$=F(1,553)=34.62$, $p<.001$, partial eta$^2=.059$; EAT-diet, $F(1,553)=21.90$, $p<.001$, partial eta$^2=.038$; EAT-bulimia, $F(1,553)=6.818$, $p=.009$, partial eta$^2=.012$; EAT-oral control, $F(1,553)=4.743$, $p=.03$, partial eta$^2=.009$; EAT-26 total, $F(1,553)=20.63$, $p<.001$, partial eta$^2=.036$. For all outcome variables females scored higher than males. There was no significant interaction effect of ethnicity-language category and gender ($p=.322$).

Table 4. Mean BSQ, EAT-26, and BES scores among Caucasian, CC and CE participants

Scale	Caucasian		CC		CE	
	Females (*M* ± *SD*)	Males (*M* ± *SD*)	Females (*M* ± *SD*)	Males (*M* ± *SD*)	Females (*M* ± *SD*)	Males (*M* ± *SD*)
BSQ	99.28 ± 36.42	65.07 ± 26.98	82.01 ± 30.80	61.81 ± 21.06	73.50 ± 28.18	57.00 ± 15.06
EAT-26 Total	10.46 ± 10.91	4.25 ± 4.75	7.61 ± 8.22	4.41 ± 5.94	8.50 ± 7.66	2.79 ± 2.76
EAT-Diet	7.41 ± 7.83	2.50 ± 3.69	4.90 ± 6.18	2.26 ± 3.69	5.28 ± 5.98	1.63 ± 2.09
EAT-Bulimia	1.36 ± 2.43	.500 ± 1.23	.887 ± 1.92	.672 ± 1.98	1.00 ± 2.17	.053 ± .229
EAT-Oral Control	1.64 ± 2.51	1.26 ± 1.66	1.82 ± 1.95	1.48 ± 2.03	2.22 ± 1.73	1.11 ±1.45
BES-SA[a]	46.19 ± 7.36		41.03 ± 5.37		45.82 ± 7.77	
BES-PA [b]		38.96 ± 6.36		35.87 ± 5.20		39.00 ± 6.45
BES-WC[a]	27.67 ± 8.76		28.89 ± 6.90		34.06 ± 8.53	
BES-UBS[b]		30.53 ± 7.34		28.87 ± 5.04		31.88 ± 7.27
BES-PC[c]	29.73 ± 6.71	44.70 ± 10.23	28.58 ± 6.08	42.23 ± 8.04	32.18 ± 6.25	46.76 ± 8.59

Note. CC= Chinese participants who completed the survey in Chinese; CE=Chinese participants who completed the survey in English; BSQ= Body Shape Questionnaire; EAT-26 Total= Eating Attitudes Test total score; EAT-Diet= Eating Attitudes Test Dieting subscale; EAT-Bulimia= Eating Attitudes Test Bulimia & Food Preoccupation subscale; EAT-Oral Control= Eating Attitudes Test Oral Control subscale; BES-SA= Body Esteem Scale-Sexual Attractiveness subscale; BES-PA= Body Esteem Scale-Physical Attractiveness subscale; BES-WC= Body Esteem Scale Weight Concern subscale; BES-UBS= Body Esteem Scale Upper Body Strength subscale; BES-PC= Body Esteem Scale Physical Condition subscale; *M*= mean score; *SD*= standard deviation.
[a] Subscale is only calculated for females.
[b] Subscale is only calculated for males.
[c] Different items contribute to subscale for males and females.

Ethnic Differences on Dimensions of Body Esteem

      Separate MANCOVAs were conducted for females and males to test for ethnic differences

on body esteem dimensions. For each MANCOVA the independent variable was ethnicity-language

category, and the gender-specific BES subscales were the dependent variables (SA, WC, and PC for

females; PA, UBS, and PC for males). Age was entered as a covariate in each MANCOVA. For females, multivariate analysis showed a significant main effect of ethnic-language category, Wilks' lambda=.859, $F(3,656)=8.642$, $p<.001$, partial eta^2=.073. Univariate analyses revealed non-significant between-group differences in WC ($p=.129$), and in PC ($p=.098$). Significant differences were found, however, for SA scores, $F(2,330)=17.234$, $p<.001$, partial eta^2=.095.Specifically, Caucasian females had significantly higher SA scores than CC females ($p<.001$). There were no differences between CC and CE females ($p=.08$), or between Caucasian and CE females ($p=.861$).

Among males, there was a significant multivariate effect of ethnicity-language category on BES subscales, Wilks' lambda=.935, $F(6,408)=2.328$, $p=.032$, partial eta^2=.033. Univariate tests indicated that there were non-significant differences in UBS ($p=.165$) and PC ($p=.149$). There were between-group differences in PA, $F(2,206)=5.552$, $p=.004$, partial eta^2=.051. Caucasian males reported significantly higher levels of PA than CC males ($p=.004$). There were no significant differences between CC and CE males ($p=.189$) or between Caucasian and CE males ($p=1.00$).

Ethnic Identity as a Predictor of Body Dissatisfaction and Disordered Eating among Chinese Participants

Ethnic Identity in CC and CE Participants. In order to determine if there were baseline differences in ethnic identity subscale scores between CC and CE participants, one way ANOVAs were calculated for males and females, with ethnicity-language category (CC or CE) as the independent variable, and EIS and ABC scores as the dependent variable. There were no significant differences in EIS scores for females ($p=.785$; CC: $M=2.78\pm.45$; CE: $M=2.74\pm.57$) or males ($p=.321$; CC: $M=2.77\pm .43$; CE: M=2.66±.43). There were also no between-group differences in ABC scores for females ($p=.825$; CC: $M= 3.15\pm.45$; CE: $M= 3.18 \pm.64$) or males ($p=.820$; CC: $M=3.07\pm.56$; CE: $M=3.03\pm.49$).

Body Image Dissatisfaction in Chinese Females. For Chinese females (including CC and CE), when EIS was entered as the sole predictor in step one, the model fit was non-significant

(p=.166). When ABC was added in step two, both EIS (β=.341, p=.012) and ABC (β=-.310, p=.022) were significantly related to the outcome variable, BSQ total scores. With both ethnic identity variables included as predictors, the new model accounted for 8.4% of the variability of BSQ scores, representing a significant increase over that of the first model (R^2 change=.06, F change(1,82)=5.41, p=.022). This model did reach statistical significance, F(2,82)=3.736, p=.028. Results suggest that, for Chinese females, increased efforts to participate and learn about their ethnic culture and practices (measured by EIS scores) combined with decreased feelings of belonging and attachment to their ethnic group (measured by ABC scores), are associated with greater total BSQ scores. The unstandardized regression coefficients (B), the standardized regression coefficients (β), R, R^2, and adjusted R^2 are presented in Table 5.

Table 5. Summary of hierarchical regression analyses predicting total BSQ[a] scores by ethnic identity subscales for Chinese participants

	Females						Males					
Predictor	B	SE B	β	R^2	Adj. R^2	ΔR^2	B	SE B	β	R^2	Adj. R^2	ΔR^2
Step 1				.023	.011	.023				.012	-.002	.012
EIS[a]	.323	.231	.152				.223	.240	.109			
Step 2				**.084**	**.061**	**.060**				.053	.026	.041
EIS[a]	**.726**	**.284**	**.341**				.489	.281	.239			
ABC	**-.098**	**.042**	**-.310**				-.059	.033	-.240			

Note. BSQ= Body Shape Questionnaire; EIS=Ethnic Identity Search; ABC=Affirmation, Belonging & Commitment; bolded text denotes statistical significance at p<.05.
[a] Variable underwent logarithmic transformation.

In order to determine whether this relationship differs between CC and CE females, the same regression was run separately for each group. For CC females, when EIS was entered as the predictor in step one, the model fit was significant, F(1, 65)=4.801, p=.032, and accounted for 7% of the

variance in BSQ total scores. When ABC was added in step two, the model accounted for 10% of the variance in BSQ scores, although this increase was not significant (R^2 change=.033, F change, p=.130). The model fit, however, was significant, $F(2,64)$=3.627, p=.032. EIS remained a significant predictor (β=.370, p=.009), while ABC was not (β= -.211, p=.130). These results indicate that for CC females, increased effort to participate in their ethnic culture is associated with greater total BSQ scores. Results are reported in Table 6. Summary of hierarchical regression analyses predicting total BSQ[a] scores by ethnic identity subscales for CC participants

Table 6. Summary of hierarchical regression analyses predicting total BSQ[a] scores by ethnic identity subscales for CC participants

Predictor	Females						Males					
	B	SE B	β	R^2	Adj. R^2	ΔR^2	B	SE B	β	R^2	Adj. R^2	ΔR^2
Step 1				**.069**	**.054**	**.069**				.011	-.009	.011
EIS	**.092**	**.042**	**.262**				.035	.047	.103			
Step 2				.102	.074	.033				.021	-.018	.010
EIS	**.130**	**.048**	**.370**				.058	.057	.173			
ABC	-.075	.049	-.211				-.031	.043	-.122			

Note. CC= Chinese participants who completed the survey in Chinese; BSQ= Body Shape Questionnaire; EIS=Ethnic Identity Search; ABC=Affirmation, Belonging & Commitment; bolded text denotes statistical significance at p<.05.
[a] Variable underwent logarithmic transformation.

For CE females, the model fit at step one, with EIS as the predictor, was non-significant, (p=.476). When ABC was added in step 2, the model remained non-significant (p=.294). Neither variable, EIS (β=.091, p=.429) or ABC (β= -.513, p=.169) significantly predicted BSQ total scores. These values are reported in Table 7.

Body Image Dissatisfaction in Chinese Males. Among Chinese males, the overall model fit was not significant with EIS as the predictor variable in step one (p=.356). Though the fit was

improved when both EIS and ABC were included in step two, the model again failed to reach

significance (*p*=.146). Neither EIS (*β*=.239, *p*=.086) or ABC (*β*= -.240, *p*=.084) were significantly

Table 7. Summary of hierarchical regression analyses predicting total BSQ[a] scores by ethnic identity subscales for CE participants

Predictor	Females						Males					
	B	SE *B*	*β*	R^2	Adj. R^2	Δ R^2	*B*	SE *B*	*β*	R^2	Adj. R^2	Δ R^2
Step 1				.032	-.028	.032				.000	-.052	.000
EIS	-.045	.062	-.179				-.805	8.54	-.022			
Step 2				.151	.037	.118				.203	.114	.202
EIS	.091	.111	.360				7.78	8.81	.209			
ABC[b]	-.513	.355	-.640				-13.8	6.45	-.505			

Note. CC= Chinese participants who completed the survey in English; BSQ= Body Shape Questionnaire; EIS=Ethnic Identity Search; ABC=Affirmation, Belonging & Commitment.
[a] Variable underwent logarithmic transformation for analyses with CE females.
[b] Variable underwent square root transformation for analyses with CE females.

associated with BSQ total scores. When looking at the regression results for CC males alone, the

model was not significant at either step one (with EIS as a predictor), (*p*=.462), or step two, (*p*=.593).

Neither EIS (*β*=.173, *p*=.315) nor ABC (*β*= -.122, *p*=.477) were significant predictors. Values for

these models are reported in Tables 5 and 6, respectively.

For CE males, step one was not significant (*p*=.926). When EIS and ABC were entered as

predictors in step two, the model accounted for a marginally significant increase in variance of BSQ

scores, (R^2 change=.202, *F* change, *p*=.047). The model fit, however, did not reach significance,

(*p*=.130). While EIS was not significantly associated with the outcome variable (*β*=.209, *p*=.389),

ABC was a marginally significant predictor of BSQ total scores (*β*= -.505, *p*=.047). These results are

reported in Table 7.

Disordered Eating in Chinese Females. For Chinese females (CC and CE, collectively), the overall model fit for step one, with EIS as the predictor, was not significant ($p=.345$). The model remained non-significant in step two, with both EIS ($\beta= -.018$, $p=.897$) and ABC ($\beta=.206$, $p=.135$) as predictors, ($p=.208$). These results indicate that there is no significant predictive relationship between either of the ethnic identity variables and disordered eating (as measured by EAT-26 total scores) behaviors among Chinese females. The unstandardized regression coefficients (B), the standardized regression coefficients (β), R, R^2, and adjusted R^2 are presented in Table 8.

Table 8. Summary of hierarchical regression analyses predicting total EAT-26[a] scores by ethnic identity subscales for Chinese participants

Predictor	Females						Males					
	B	SE B	β	R^2	Adj. R^2	ΔR^2	B	SE B	β	R^2	Adj. R^2	ΔR^2
Step 1				.011	-.001	.011				**.071**	**.057**	**.071**
EIS[a]	.532	.560	.105				**1.34**	**.595**	**.266**			
Step 2				.038	.014	.027				**.141**	**.115**	**.070**
EIS[a]	-.089	.691	-.018				**2.33**	**.717**	**.461**			
ABC	.158	.104	.206				**-.201**	**.086**	**-.330**			

Note. EAT-26= Eating Attitudes Test; EIS=Ethnic Identity Search; ABC=Affirmation, Belonging & Commitment, bolded text denotes statistical significance at $p<.05$.
[a] Variable underwent logarithmic transformation.

Looking at CC females separately, a similar pattern was observed, as the regression models were non-significant with EIS as the sole predictor in step one, ($p=.323$) and with EIS and ABC as predictors in step two ($p=. 276$). Neither variable significantly predicted EAT-26 scores (EIS, $\beta=.032$, $p=.823$; ABC, $\beta=.182$, $p=.207$). For CE females, the model fits were again non-significant at both step one, ($p=.879$), and at step two, ($p=.941$). Neither EIS ($\beta= -.088$, $p=.859$) nor ABC ($\beta=.153$, $p=.758$) significantly predicted EAT-26 scores. Statistical values are reported in Tables 9 and 10 for CC and CE participants, respectively.

<u>Disordered Eating in Chinese Males</u>. Analyses yielded a different pattern of findings for Chinese males (including CC and CE). In the first step, EIS was significantly related to the outcome variable, and the overall model fit was significant, $F(1,67)=5.083$, $p=.027$. This model accounted for

Table 9. Summary of hierarchical regression analyses predicting total EAT[a] scores by ethnic identity subscales for CC participants

Predictor	Females						Males					
	B	SE B	β	R^2	Adj. R^2	ΔR^2	B	SE B	β	R^2	Adj. R^2	ΔR^2
Step 1				.015	.000	.015				**.106**	**.088**	**.106**
EIS	.362	.363	.124				**.910**	**.377**	**.326**			
Step 2				.040	.010	.025				.173	.138	.066
EIS	.094	.418	.032				**1.41**	**.445**	**.503**			
ABC	.542	.425	.182				-.662	.338	-.313			

<u>Note</u>. CC= Chinese participants who completed the survey in Chinese; EAT-26= Eating Attitudes Test; EIS=Ethnic Identity Search; ABC=Affirmation, Belonging & Commitment; bolded text denotes statistical significance at $p<.05$.
[a] Variable underwent square root transformation.

Table 10. Summary of hierarchical regression analyses predicting total EAT[a] scores by ethnic identity subscales for CE participants

Predictor	Females						Males					
	B	SE B	β	R^2	Adj. R^2	ΔR^2	B	SE B	β	R^2	Adj. R^2	ΔR^2
Step 1				.002	-.065	.002				.000	-.062	.000
EIS	.084	4.06	.040				-.038	1.38	-.020			
Step 2				.009	-.133	.007				.002	-.131	.002
EIS	-.186	1.03	-.088				.021	.624	.011			
ABC[b]	1.07	3.42	.153				-.073	.480	-.050			

<u>Note</u>. CE= Chinese participants who completed the survey in English; EAT-26= Eating Attitudes Test; EIS=Ethnic Identity Search; ABC=Affirmation, Belonging & Commitment.
[a] Variable underwent square root transformation.
[b] Variable underwent square root transformation for analyses with CE females.

approximately 7% of the variability in EAT-26 scores. With both EIS (β=.461, p=.002) and ABC (β= -.330, p=.023) included as predictors, the new model accounted for 14% of the variability of EAT-26 scores, representing a significant increase over that of the first model (R^2 change=.07, F change (1,66)=5.396, p=.023). The model again reached statistical significance, F(2,66)=5.406, p=.007. It appears that among Chinese males, increased EIS scores and decreased ABC scores are associated with greater levels of disordered eating, as measured by the EAT-26 total score. Values are reported in Table 9.

When regression analysis was conducted with CC males, EIS as a sole predictor of EAT-26 totals resulted in a significant model fit, F(1,49)=5.827, p=.02, and accounted for approximately 11% of the variance of the outcome variable.EIS was a significant predictor (β= .326, p=.02). When EIS and ABC were entered as predictors in the next step, the model remained significant, F(2,48)=5.004, p=.011, accounting for 17% of the variance in EAT-26 scores. EIS (β=.503, p=.003) remained a significant predictor of EAT-26 scores while ABC (β= -.313, p=.056) was marginally non-significant. For CE males, the model fit was non-significant at step one (p=.936) and at step two, (p=.986). EIS (β=.011, p=.973) and ABC (β= -.05, p=.882) were not significantly associated with EAT-26 total scores. Values are presented in Tables 9 and 10 for CC and CE participants, respectively.

Discussion

The first aim of this investigation was to test the Westernization model of eating disorders by comparing Chinese and Caucasian scores on measures of disordered eating, body image, and body esteem. Chinese participants (both CE and CC) were expected to fare worse than their Caucasian counterparts on all outcome variables. Contrary to this prediction, no differences emerged between Caucasian and Chinese participants in terms of body image disturbance or disordered eating. It is possible that Western values increase symptom presentation among individuals of both ethnicities equally, which accounts for the lack of significant differences between the Chinese and Caucasian samples. This is inconsistent, however, with existing literature that has prompted researchers to argue that the relationship between Western cultural variables in the presentation of subclinical eating disorders is stronger for Caucasian young adult women than it is for non-Caucasians living among Caucasian cultures (Wildes, Emery & Simons, 2001). It is also possible that the lack of differences is due to the fact that all participants are drawn from non-clinical samples. Mean EAT-26 scores for all groups fall well below the clinical cutoff score of 20 identified by Garner et al. (1982). Similarly, mean BSQ scores for all groups in this study were lower than those of individuals diagnosed with an eating disorder or likely to have a clinical eating disorder (Cooper et al., 1992). The non-clinical nature of the current sample may have resulted in insufficient levels of symptom presentation to detect differences. While there are a number of plausible explanations for the lack of differences between the CE, CC and Caucasian samples in terms of disordered eating and body image, such findings do not appear to directly support the traditional Westernization model, in which Caucasians are expected to have greater levels of eating-related pathology than non-Western counterparts.

While there were no differences between ethnicities in terms of eating disorder symptoms and body dissatisfaction, some differences were found in regards to body esteem. Specifically, Caucasian men and women demonstrated higher levels of physical attractiveness and sexual

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attractiveness, respectively, than CC participants. it is possible that Chinese participants adopted the dominant culture's attractiveness values as a reference point. There appears to be some support for this theory, as one study found that Chinese women residing in the United States demonstrated a higher need for conformity to the mainstream culture, even more than Caucasian women. This need for conformity was positively correlated with discrepancies between their perceived and ideal physical characteristics (Evans & McConnell, 2003). Similar findings have resulted from research conducted in China, in which Chinese men and women demonstrated preferences for Caucasian male models over Chinese models. Chinese women also preferred Caucasian female models to Chinese models (Jankowiak, Gray & Hattman, 2008). The authors argue that these findings do not necessarily represent cultural hegemony, or the dominance of Western culture. Rather, they recommend considering the results in terms of an evolutionary perspective, in which globalization influences perceptions of what various physical attributes represent (e.g, wealth, maturity, well-balanced character; Jaknowiak et al., 2008). The present findings suggest that if the CC participants evaluated themselves based on the mainstream cultural attractiveness, they perceived themselves as falling short of this ideal.

Interestingly, there were no differences in body esteem scores between Caucasian and CE participants or between CC and CE participants. Since there were fewer CE participants than in the other groups, it is difficult to draw conclusions regarding these findings. However, the results suggest that these individuals fell somewhere between the CC and Caucasian participants in terms of body esteem. It is plausible that these Chinese individuals who opted to complete the survey in English adhere more to Western cultural standards than their counterparts who chose to complete the survey in their native language. This highlights the importance of language when conducting cross-cultural research. In this study, CC participants had a different relationship with Caucasians than did CE

participants. Without allowing participants to complete the survey in their preferred language, it is likely that these differences would not have been identified.

The second aim of this paper was to determine if there were gender differences within the sample. It was expected that women would have higher symptoms of body image dissatisfaction and disordered eating than men. These predictions were supported by the results, with females displaying higher totals on the BSQ, EAT-26 and EAT-26 subscales, supporting a large body of literature suggesting that, Caucasian and Asian women appear to display more symptoms associated with eating disorders than men (e.g., Davis & Katzman, 1998; Kowner, 2002; Liao et al., 2010; Mintz & Kashubeck, 1999). Though there was no interaction between gender and ethnicity-language in this study, previous research has found gender differences among Chinese groups to be smaller than those found in Caucasian groups in regards to disordered eating and body image among college students (Mintz & Kashubeck, 1999). It is possible that women in general are more prone to develop disordered eating behaviors, and other factors, such as ethnic identity, influence symptom presentation between genders. Future research would benefit from exploring these factors in relation to cultural variables to determine their role in eating-related pathology.

The final aim of the current study was to test the predictive value of ethnic identity on disordered eating and body image dissatisfaction among Chinese participants. The measure used in this study to assess ethnic identity, the MEIM (Roberts et al., 1999), assesses two aspects of ethnic identity: commitment and attachment to the group (ABC) and exploration (EIS). It was hypothesized that a greater sense of ethnic identity, indicated by higher scores on the EIS and ABC would predict greater levels of body image dissatisfaction and disordered eating. Interesting patterns emerged that indicate the relationship between ethnic identity and eating and body image differ in terms of both gender and language choice.

For the collective sample of Chinese women, the EIS alone was not a significant predictor of disordered eating or body image. When accounting for ABC scores, the relationship remained non-significant in regards to disordered eating, but was significantly related to body image dissatisfaction. Interestingly, the combination of increased EIS scores and lower ABC scores result in higher levels of body dissatisfaction (measured by BSQ scores). For Chinese women residing in the United States, it appears that increased effort to learn about and become involved with traditional ethnic cultural practices does not alone predict body image dissatisfaction. However, when higher levels of such exploration are paired with lower levels of belonging and commitment to the group, these women appear to be more likely to experience body image dissatisfaction.

Among Chinese men, there was no predictive relationship between either ethnic identity component and body dissatisfaction. However, higher EIS scores did predict higher EAT-26 scores. The combination of EIS and ABC showed a stronger predictive value of EAT-26 totals. Specifically, increased exploration and involvement in ethnic activities, combined with lower degrees of commitment and feelings of belonging increase disordered eating behaviors among Chinese men currently living in the United States.

While Phinney and Ong (2007) argue that though commitment and a sense of belonging to the group is the most important aspect of ethnic identity, by itself it is not enough to elicit a strong and stable sense of identity with one's ethnic group. The process of exploration, which involves making efforts to gather information about the group and seeking out related experiences, is crucial to developing an informed basis for committed ethnic identity. As explained by Phinney and Ong (2007), ethnic identity is generally believed to be stable by adulthood, though exploration may continue to occur throughout the lifespan. It is possible that the Chinese participants in this study have not yet achieved a stable ethnic identity, or that they are re-engaging in the exploration phase as a result of their residency in the United States. Those who currently lack a solid sense of ethnic

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identity may be vulnerable to perceived messages about appearance values of the mainstream culture, resulting in body dissatisfaction and disordered eating.

Interestingly, when looking at CC participants separately, the nature of the relationship between ethnic identity and disordered eating and body image was different. Among CC women, EIS scores alone predicted BSQ scores, while ABC played no predictive role. For CC men EIS was also the sole predictor of EAT-26 scores. While language choice alone is not an indicator of acculturation, it is possible that Chinese participants who indicated that they were most fluent in Chinese (as opposed to English) had not adapted Western values to the same degree as their counterparts who responded in English. This is similar to the findings of Ho et al. (2006) who found that speaking Malay at home was associated with increased risk of eating disorders among females living in Singapore, while speaking English at home was not. This study extends these findings, as language choice was determined based on a behavioral indictor (i.e., completing the survey in Chinese or English), rather than self-report. In this study, it appears that Chinese participants who did not demonstrate a strong sense of ethnic identity (i.e., individuals who were in the exploration phase, but not experiencing a strong sense of commitment and belonging), and CC individuals who were making increased exploration attempts were at the greatest risk for symptoms associated with disordered eating.

The fact that EIS and ABC did not predict disordered eating or body dissatisfaction for either CE group is particularly surprising, as there were no differences in EIS or ABC scores between CE and CC men and women. As there were fewer participants in the CE group than in the other groups the regression analyses were underpowered, making it difficult to draw conclusions from this finding. However, it again reveals differences among Chinese participants based on the language in which they completed the study which would otherwise be overlooked if participants were required to complete the questionnaires in English.

There are, of course, a number ways in which the current investigation may be improved in the future. This study utilized an anonymous survey format which may result in sample bias, as those who completed it may differ from those who did not. While the translated measures utilized a widely used variant of written Chinese (Simplified Chinese), it is not common to all areas of China. Thus, it is possible that some participants may have had some difficulty understanding the Chinese questionnaires. As it is useful to offer translated measures when conducting cross-cultural work, it may be beneficial to restrict participation to those who are familiar with the written form being used. Along the same lines, future research should attend to the psychometric properties of the measures being used. In this investigation, the factor structure of the BSQ and EAT-26 were evaluated for the Chinese and Caucasian samples in order to determine their appropriateness for use. The factor structure of the BSQ was similar for each sample, and comparable to that of previous research. The factor structure of the EAT-26, however, was different for Caucasians and Chinese. Neither solution replicated existing literature, though it is worthwhile to note that a number of different factor solutions have been proposed for that measure. Analysis of the psychometric properties of eating and body image measures in larger Chinese samples is an important step in furthering this area of cross-cultural research.

Another area for improvement has to do with the sources of each ethnic sample group. Chinese participants were recruited from universities throughout the United States, while Caucasians were drawn from the psychology experiment pool at a single university. Additionally, these participants received course credit, while the Chinese participants were not compensated. Reducing these types of sample differences and compensating all groups equally may reduce sample differences and increase the generalizability of future findings.

Despite these limitations, this study has a number of strengths that represent improvements over existing literature. That participants were distinguished as Chinese participants, rather than

including a more general Asian group allows for understanding of factors influencing disordered eating in this specific Asian subgroup. Similarly, the Chinese participants were also distinct from Chinese Americans, which enhances the comparisons of ethnic differences, as participants in each ethnic group are more likely to represent distinct ethnic identities.

One major strength of this paper lies in the fact that participants were able to complete the measures in the language in which they were most fluent. In addition to potentially including a larger, more representative sample of Chinese participants, this allowed for comparisons between English responders and Chinese responders. The results of these analyses were particularly interesting, as there were unexpected differences between the CE and CC groups. This suggests another advantage to allowing participants to respond in the language of their choice, as analyses may reveal differences that would otherwise be overlooked.

In conclusion, the results of this study do not provide direct support for the standard Westernization model used to conceptualize eating disorders; in fact Caucasian and Chinese participants did not differ in terms of disordered eating and various aspects of body esteem. While there has been a large amount of inconsistency in the literature regarding the degree to which Western values influence eating pathology, the current findings further the literature by comparing Chinese-responding and English-responding participants to Caucasians. In terms of sexual attractiveness for females and physical attractiveness for men, CC participants actually reported lower body esteem than Caucasians. There were no differences between CE participants and either of the other groups, suggesting that these individuals fall in the middle of the spectrum of eating and body image concerns represented by this sample. Future research including a larger sample of CE participants is needed in order to gain greater insight into the nature of these findings.

As expected, all groups of females had higher levels of body dissatisfaction and disordered eating than males. Future research may extend these findings by investigating the degree to which

cultural context influences the gender differences in eating pathology within ethnic groups.

Regarding the role of ethnic identity in eating disordered symptoms among Chinese sample as a whole, current findings indicate that individuals who did not display a stable ethnic identity were more at risk for body image disturbance among women and disordered eating among men. For the CC group, ethnic identity search behaviors alone predicted body dissatisfaction and disordered eating for females and males, respectively. This differs from the CE men and women, for whom neither ethnic identity variable predicted EAT-26 nor BSQ scores, highlighting a potentially important difference between participants within the Chinese group. While a small sample size may have limited the ability to detect such relationships in this study, it is also possible that this subgroup is affected more by Western values than traditional ethnic practices. Since this study did not evaluate acculturation to Western ideals and values, the nature of the relationship between ethnic identity and Western acculturation on eating disorder symptom remains unclear. Future research would benefit from assessing both of these constructs in order to more fully understand this relationship, particularly among subgroups of Chinese individuals, such as those described in this study.

Moving forward with cross-cultural eating disorder research, it is important to consider alternatives to the traditional Westernization understanding of eating disorders. It appears that the cultural influences on symptom presentation in non-Western cultures are more complex than simply being exposed to Western appearance ideals. Rather, the relationship between traditional ethnic identity and acceptance of the mainstream cultural values is likely an important factor in body dissatisfaction and disordered eating. Longitudinal research in this area may offer insight as to how these factors change and interact over time. Efforts to clarify this relationship may result in a new, cross-culturally valid conceptualization of the mechanisms underlying eating disorders.

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Appendix A

BSQ Factor Loadings

Item	Factor Loading	
	Caucasian	Chinese
1. Has feeling bored made you brood about your shape?	.668	.629
2. Have you been so worried about your shape that you have been feeling that you ought to diet?	.843	778
3. Have you thought that your thighs, hips or bottom are too large for the rest of you?	.738	.578
4. Have you been afraid that you might become fat (or fatter)?	.832	.708
5. Have you worried about your flesh not being firm enough?	.690	-
6. Has feeling full (e.g., after eating a large meal) made you feel fat?	.745	.705
7. Have you felt so bad about your shape that you have cried?	.651	.731
8. Have you avoided running because your flesh might wobble?	.607	.557
9. Has being with thin women/men made you feel self-conscious about your shape?	.858	.716
10. Have you worried about your thighs spreading out when sitting down?	.733	.696
11. Has eating even a small amount of food made you feel fat?	.694	.621
12. Have you noticed the shape of other women/men and felt that your own shape compared unfavorably?	.838	.711
13. Has thinking about your shape interfered with your ability to concentrate (e.g., while watching television, reading, listening to conversations)?	.718	.658
14. Has being naked, such as when taking a bath, made you feel fat?	.856	.762
15. Have you avoided wearing clothes which make you particularly aware of the shape of your body?	.829	.734
16. Have you imagined cutting off fleshy areas of your body?	.702	.713

17. Has eating sweets, cakes, or other high calorie food made you feel fat?	.804	.689
18. Have you not gone out to social occasions (e.g., parties) because you have felt bad about your shape?	.677	.712
19. Have you felt excessively large and rounded?	.794	.729
20. Have you felt ashamed of your body?	.863	.712
21. Has worry about your shape made you diet?	.809	.729
22. Have you felt happiest about your shape when your stomach has been empty (e.g., in the morning)?	.702	.540
23. Have you thought that you are the shape you are because you lack self-control?	.763	.713
24. Have you worried about other people seeing rolls of flesh around your waist or stomach?	.853	.747
25. Have you felt that it is not fair that other women/men are thinner than you?	.781	.722
26. When in company have you worried about taking up too much room (e.g., sitting on a sofa or a bus seat)?	.591	.702
27. Have you worried about your flesh being dimply?	.607	.600
28. Has seeing your reflection (e.g., in a mirror or shop window) made you feel bad about your shape?	.836	.770
29. Have you pinched areas of your body to see how much fat there is?	.728	.653
30. Have you avoided situations where people could see your body (e.g., communal changing rooms or swimming baths)?	.741	.609
31. Have you been particularly self-conscious about your shape when in the company of other people?	.838	.745
32. Has worry about your shape made you feel you ought to exercise?	.735	.618

Note. BSQ= Body Shape Questionnaire; - indicates item was not retained in the final solution.

EAT-26 Factor Loadings (Caucasians)

Item	Factor Loading
Dieting subscale	
1. I am preoccupied with a desire to be thinner	.826
2. I am preoccupied with the thought of having fat on my body	.766
3. I think about burning up calories when I exercise	.764
4. I engage in dieting behavior	.759
5. I feel uncomfortable after eating sweets	.708
6. I am terrified about being overweight	.652
7. I eat diet foods	.650
8. I feel extremely guilty after eating	.643
9. I like my stomach to be empty	.633
10. I give too much time and thought to food	.622
11. I am aware of the calorie content of the food I eat	.499
12. I avoid eating when I am hungry	.486
13. I enjoy trying new, rich foods	.363
Food Behaviors & Avoidance subscale	
1. I particularly avoid foods with a high carbohydrate content (e.g., bread, rice, potatoes, etc.)	.719
2. I vomit after I have eaten	.680
3. I avoid foods with sugar in them	.669
4. I have the impulse to vomit after meals	.592
5. I cut my food into small pieces	.497
6. I take longer than others to eat my meals	.333
Food Preoccupation subscale	
1. I have gone on eating binges where I feel I might not be able to stop	.691
2. I feel that food controls my life	.602
3. I find myself preoccupied with food	.547
Others' Perceptions subscale	
1. I feel that others would prefer if I ate more	.853
2. Other people think that I am too thin	.800
3. I feel that others pressure me to eat	.673

Note. EAT-26= Eating Attitudes Test.

Appendix C

EAT-26 Factor Loadings (Chinese)

Item	Factor Loading
Dieting/Food Preoccupation subscale	
1. I feel extremely guilty after eating	.928
2. I am preoccupied with a desire to be thinner	.856
3. I like my stomach to be empty	.800
4. I have gone on eating binges where I feel that I may not be able to stop	.783
5. I am terrified about being overweight	.774
6. I am preoccupied with the thought of having fat on my body	.737
7. I avoid eating when I am hungry	.705
8. I find myself preoccupied with food	.580
9. I feel that food controls my life	.543
10. I think about burning up calories when I exercise	.497
11. I engage in dieting behavior	.479
12. I give too much time and thought to food	.410
Awareness of Food Content subscale	
1. I avoid foods with sugar in them	.825
2. I am aware of the calorie content of foods that I eat	.758
3. I particularly avoid foods with a high carbohydrate content (e.g., bread, rice, potatoes, etc.)	.699
4. I eat diet foods	.605
5. I feel uncomfortable after eating sweets	.440
Vomiting & Concern subscale	
1. I have the impulse to vomit after meals	.863
2. I vomit after I have eaten	.811
3. Other people think that I am too thin	.424

Note. EAT= Eating Attitudes Test.

Appendix D

Comparison of Study Means to Previously Reported Means (Females)

Scale	Caucasian		Asian	
	Current Study $(M \pm SD)$	Comparison Sample $(M \pm SD)$	Current Study $(M \pm SD)$	Comparison Sample $(M \pm SD)$
BSQ	99.28 ± 36.42	95.57 ± 34.64[a]	80.29 ± 30.23	78.21 ± 29.58[a]
EAT-26 Total	10.46 ± 10.91	9.9 ± 9.2[b]	7.79 ± 8.07	9.28 ± 9.92[c]
EAT-Diet	7.47 ± 7.83	7.1 ± 7.2[b]	4.98 ± 6.11	6.08 ± 6.85[c]
EAT-Bulimia	1.36 ± 2.43	1.0 ± 2.1[b]	.91 ± 1.96	1.16 ± 2.61[c]
EAT-Oral Control	1.64 ± 2.51	1.9 ± 2.1[b]	1.90 ± 1.91	2.04 ±2.24[c]
BES-SA	46.19 ± 7.36	43.5 ± 5.7[d]	42.04 ± 6.21	41.9 ± 7.3[d]
BES-WC	27.69 ± 8.76	25.9 ± 8.8[d]	29.96 ± 7.52	32.0 ± 9.2[d]
BES-PC	29.73 ± 6.71	46.1 ± 8.8[d]	29.33 ± 6.25	47.1 ± 11.9[d]

Note. BSQ= Body Shape Questionnaire; EAT-26 Total= Eating Attitudes Test total score; EAT-Diet= Eating Attitudes Test Dieting subscale; EAT-Bulimia= Eating Attitudes Test Bulimia & Food Preoccupation subscale; EAT-Oral Control= Eating Attitudes Test Oral Control subscale; BES-SA= Body Esteem Scale-Sexual Attractiveness subscale; BES-WC= Body Esteem Scale Weight Concern subscale; BES-PC= Body Esteem Scale Physical Condition subscale; M= mean score; SD= standard deviation.

[a] Comparison samples include Caucasian and Asian American college students at a New England University reported by Akan & Grilo (1995).

[b] Comparison sample is a female Canadian college sample described by Garner, Olmstead, Bohr, & Garfinkel (1982) in the original report on the psychometric properties of the EAT-26.

[c] Comparison sample represents Chinese international students attending college at a Midwestern university in the United States, as reported in Stark-Wroblewski, Yanico, & Lupe (2005).

[d] Comparison sample includes Caucasian and Hmong American college students, as reported by Franzoi & Chang (2002).

Appendix E

Comparison of Study Means to Previously Reported Means (Males)

Scale	Caucasian		Asian	
	Current Study ($M \pm SD$)	Comparison Sample ($M \pm SD$)	Current Study ($M \pm SD$)	Comparison Sample ($M \pm SD$)
BSQ	63.50 ± 24.72	59.53 ± 20.55[a]	60.62 ± 19.77	-
EAT-26 Total	4.25 ± 4.75	7.0 ± 7.3[b]	4.01 ± 5.36	6.1 ± 6.3[c]
BES-PA	38.96 ± 6.36	37.4 ± 4.2[d]	36.64 ± 5.65	40.4 ± 12.0[d]
BES-UBS	30.53 ± 7.38	30.4 ± 6.2[d]	29.61 ± 5.76	32.2 ± 7.0[d]
BES-PC	44.70 ± 10.29	46.1 ± 8.8[d]	43.35 ± 8.35	47.1 ± 11.9[d]

Note. BSQ= Body Shape Questionnaire; EAT-26 Total= Eating Attitudes Test total score; BES-PA= Body Esteem Scale-Physical Attractiveness subscale; BES-UBS= Body Esteem Scale Upper Body Strength subscale; BES-PC= Body Esteem Scale Physical Condition subscale; - indicates that a representative comparison sample was unavailable; M= mean score; SD= standard deviation.

[a] Comparison sample is a group of heterosexual males (71 % Caucasian) drawn from the community, as reported by Russell & Keel (2002). This study also included a sample of homosexual males. Mean BSQ score for this group was 85.33 ± 28.71.

[b] Comparison sample is an college sample of students studying from two universities in the Midwestern United States, as described by Nelson, Hughes, Katz, & Searight (1999).

[c] Comparison sample is a randomly-selected sample of medical school students in Beijing, reported by Makino, Hashizume, & Tsuboi (2006).

[d] Comparison sample includes Caucasian and Hmong American college students, as reported by Franzoi & Chang (2002).

Vita

Lauren Elizabeth Baillie was born in Boston, Massachusetts, in 1983. She received her Bachelor degree in psychology from the Catholic University of America in 2005. In 2008, she received a Master of Art degree in clinical psychology from Louisiana State University. She completed her clinical internship at the University of Mississippi Medical Center/G.V. Sonny Montgomery Veterans Affairs Medical Center in Jackson, Mississippi, in 2011. Her research interests are focused on behavioral medicine, with an emphasis on the relationship between health behaviors and head pain.