Body Image and Eating Attitudes: Comparing Chinese Females with Other Females living in New Zealand

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Abstract

Eating disorders affect individuals from most ethnic backgrounds. Research suggests that White females experience the greatest levels of disordered eating and body dissatisfaction. Studies examining Chinese females found they experienced similar levels of disordered eating but less body dissatisfaction to White females. This study was conducted to examine the prevalence of eating disorder symptomatology in Chinese and Other ethnicities in New Zealand. A sample of female university students at the University of Waikato completed questionnaires (N=116) to assess disordered eating and body dissatisfaction. In contrast to previous findings Chinese females actually exhibited more disordered eating behaviours and body dissatisfaction attitudes than did other females living in New Zealand. Also, fear of weight gain was more likely to be exhibited by Chinese females than other females. Pressure to be thin came from similar sources for both Chinese and other female students. While, length of time living in New Zealand did not appear to alter Chinese females' levels of disordered eating and body dissatisfaction. However in keeping with previous research, the present findings did suggest that the data from this study support the suggestion that the EAT-26 may not be an appropriate measure for Chinese females when assessing eating disorders. These findings have important implications for future research on ethnicities and eating disorders, and for clinicians working with Chinese female clients.

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Less than two decades ago it was believed that eating disorders afflicted primarily Western women. However within the last ten years there has been an increase in research looking at cross-cultural or ethnic differences of people with eating disorders (Cummins, Simmons & Zane, 2005; Jennings, Forbes, McDermott, Juniper & Hulse, 2005; Miller & Pumariega, 2001). With cross-cultural research in the area of eating disorders being relatively recent, results are contradictory.

Background: Eating Disorders

Individuals with an eating disorder have a distorted view of themselves and their bodies (Davison & Neale, 2001). The two most well known eating disorders are Anorexia Nervosa (AN) and Bulimia Nervosa (BN). The average prevalence rates of these two disorders within Western populations are: 0.3% for Anorexia Nervosa (AN) and 1% for Bulimia Nervosa (BN) (Hoek, 2006). In contrast, the average prevalence rates of females with AN in Hong Kong were found to be only 0.03%, suggesting that Western population are at a higher risk of AN (Miller & Pumariega, 2001). With AN there are four primary features which must be present for a DSM-IV diagnosis or to fit the ICD-10 criteria: 1) refusal to maintain body weight at 85% or more of that regarded as normal for an individual's age and height; 2) individual has an acute fear of gaining weight; 3) individual has a distorted sense of their body weight or shape, and they are unable to recognise their low body weight; and finally 4) in females "the absence of at least three consecutive menstrual cycles" or amenorrhea (American Psychiatric Association, 2000, p.589; Davison & Neale, 2001; World Health Organisation, 2003). BN is characterised by: episodes involving consumption of vast amounts of food in a short amount of time or binge eating; compensatory behaviour such as self-induced vomiting, fasting, or taking laxatives to prevent weight gain; and

body shape and weight are extremely important to an individual when appraising themselves (American Psychiatric Association, 2000; Davison & Neale, 2001; World Health Organisation, 2003). Both AN and BN have many serious physical side effects the severest of which is death (Davison & Neale, 2001). For example, individuals with AN are ten times more likely to die than the general population, and twice more likely to die than individuals with other psychological disorders (Davison & Neale, 2001).

Disordered Eating and Body Dissatisfaction

It is important not just to study clinical populations of people with eating disorders, but also to see what trends occur within the general population. Studying eating disorder symptomatogy within general populations helps to better understand why eating disorders occur, and therefore aids us in preventing them from occurring. Consequently, it is necessary to study eating disorder symptomatology such as disordered eating and body dissatisfaction. Both disordered eating and body dissatisfaction are suggested as key factors to study as they can help determine whether a person will develop AN or BN (Sheffield, Tse & Sofronoff, 2005; Neumark-Sztainer, Levine, Paxton, Smolak, Piran & Wertheim, 2006). Many studies have been conducted which examine disordered eating in various countries. Studies of young adult females and males found that 19% of the females had significant body dissatisfaction (Cash, 2002). While Levine and Smolak (2006) estimated that 10-15% of American girls and women between 9 to 19 years of age have extreme disordered eating. Another American study found that over half of the adolescent girls tested stated they utilized unhealthy weight control behaviours such as meal skipping and fasting (Neumark-Sztainer, Story, Hannan, Perry & Irving, 2002). Generally research

suggests that Western, English-speaking women have high levels of both disordered eating and body dissatisfaction (Thompson, Heinberg, Altabe & Tantleff-Dunn, 1999; Tiggemann, Verri & Scaravaggi, 2005).

While it has been suggested that disordered eating and body dissatisfaction are important factors to look at when studying eating disorders, it is also necessary to understand why people develop disordered eating and body dissatisfaction. Disordered eating and body dissatisfaction are accepted as being attributed to body weight and individuals perception of their weight (le Grange, Stone & Brownell, 1998; Wilson, Tripp & Boland, 2005). It has also been proposed that disordered eating is mainly attributable to the pursuit of thinness, which some researchers' state is primarily a Western ideal (Wilson et l., 2005; Yates, Edman, Aruguete, 2004). Therefore when researching these two factors it is important to consider body weight, individual's perception of their weight and the pressure individuals feel to be thin. The above mentioned reasons for why people have disordered eating and body dissatisfaction have been well researched within Western settings, because they are predictors of these two factors. However the research in this area with different cultures and ethnicities is still relatively new with many differing theories being put forward.

Ethnicities, Disordered Eating and Body Dissatisfaction

As mentioned previously, over the last ten years there has been an increase in the amount of research undertaken concerning eating disorders and different ethnicities or cultures. Cross-cultural or ethnic research of eating disorder symptomatology, is such a broad area that the focus of this literature review is comparing Western ethnicities with Asian ethnicities, specifically Chinese. British

studies which examined Asian ethnicities were excluded from this review, because Asian samples in Britain relate to people from countries such as India and Pakistan, whilst American or Australia Asian refers to people from countries such as Japan or China (Cummins, Simmons & Zane, 2005). In reading the literature there are a number of different labels used to describe different cultures, this is a problem because it includes different ethnicities all within one label. Describing a sample as Asian occurred often within the literature in the area of eating disorders. All literature found on Asian groups has been mentioned first in this section, and then compared with literature which studies Chinese as a group. When studying a mainstream group labels such as: Western, White or Caucasian are all used. In reviewing the literature all the labels to describe a mainstream ethnicity were taken as meaning the same group.

Some of the research in this area has found that Westerners have greater disordered eating and body dissatisfaction than do any other ethnic group (Akan & Grilo, 1994; Ball & Kenardy, 2002; Gluck & Geliebter, 2002; Miller & Pumariega, 2001; Wang, Byrne, Kenardy & Hills, 2005; Yates, Edman & Aruguete, 2004). However, other research has found that Asian groups or Chinese have similar or even greater levels of disordered eating and body dissatisfaction to Westerners (Cummins, Simmons & Zane, 2005; Haudek, Rorty & Henker, 1999; Jennings, Forbes, McDermott, Juniper & Hulse, 2006; Kennedy, Templeton, Gandhi & Gorzalka, 2004; Lake, Staiger & Glowinski, 2000; Lee & Lee, 1996; Luo, Parish, Laumann, 2005; Wildes & Emery, 2001).

A study which explored the relationship between peoples' eating attitudes and behaviours, their body image and the sociocultural influences of Caucasian, African-American, and Asian-American female students found that the Caucasian group had

the highest levels of eating disorder symptomalogy of all three groups (Akan & Grilo, 1994). In particular, the Caucasian group showed the greatest levels of disordered eating and body dissatisfaction, as measured by the EAT-26 and Eating Disorder Examination (Akan & Grilo, 1994). These findings were supported in a later study Gluck and Geliebter (2002). However, once BMI was controlled for in the analysis, there was no longer a significant difference between the Asian and Caucasian groups, bringing into question whether differences between these ethnic groups really exists. In contrast, Miller and Pumariega (2001) in a review of culture and eating disorders reported that White women were 5.5 times more likely to score above the clinical cut-off on the EAT-26 than Asian-American women; however BMI was not controlled for (Lucero, Hicks, Bramlette, Brassington & Welter, 1992). Ball and Kenardy (2002), suggest that rather than ethnicity being the crucial factor in high levels of eating disorder symptomatology, it is more closely linked to living in English speaking countries. That is, women born in Asian countries or other Non-English speaking countries had a lower risk for body weight dissatisfaction, binge eating and dieting. Together these studies suggest that, the Caucasian or White group experience the greatest levels of eating disorder sympmatology, when compared to an 'Asian' group, though controlling for BMI may result in similar levels for both groups.

However, these findings are not consistent, for example Haudek, Rorty and Henker (1999), found Asian- American college women to be significantly more dissatisfied with their weight and appearance than Caucasian college women. Jennings, Forbes, McDermott, Juniper and Hulse (2005) compared Asian and Caucasian Australian adolescent girls, and found that the Asian girls had significantly higher scores on the Eating Disorder Inventory (EDI) and EAT-26. This indicated that the Asian girls were more dissatisfied with their bodies, had greater desire to be thin,

and had higher levels of disordered eating than the Caucasian group (Jennings et al., 2005). However, Wildes and Emery (2001) in a meta-analytic review on the influence of ethnicity on eating disturbance and body dissatisfaction, found small effect sizes in studies which compared Asian and White participants, indicating there was little difference in the disordered eating and body dissatisfaction of the two groups. Wildes and Emery (2001) raised the concern that many of the studies grouped Asian women together under one label, and this could have resulted in ethnic differences between the Asian groups being masked.

Overall the studies examining disordered eating and body dissatisfaction comparing Asian with Caucasian groups produced mixed results. Three of the studies found that the Caucasian group exhibited the greatest disordered eating and body dissatisfaction (Akan & Grilo, 1994; Gluck & Geliebter, 2002; Lucero et al., 1992). Two indicated that Asian people have greater disturbed eating and body dissatisfaction (Haudek et al., 1999; Jennings et al., 2005). Finally, a meta-analytic review found there was little difference in the levels of disordered eating and body dissatisfaction for Asian and White women (Wildes & Emery, 2001).

Studying the literature where Chinese are distinguished as a group reveals more evidence of differences between ethnicities when looking at eating disorders. When Chinese were compared with other ethnicities more concise set of results emerged, than when studying Asians as a group. According to a review, symptoms of eating disorders were prevalent among Chinese living in Hong Kong and Singapore (Cummins, Simmons & Zane, 2005). Additionally, there were similar rates of disordered eating and body dissatisfaction found amongst Asian populations as within Westernized populations (Cummins et al., 2005).

One study which compared Chinese students with students of other ethnicities such as White, found that the Chinese had the lowest body dissatisfaction of any other group (Yates, Edman & Aruguete, 2004). Conversely, they also found that White women were highly dissatisfied with their bodies (Yates et al., 2004). Wang, Byrne, Kenardy and Hills (2005) in an Australian study, compared female children and adolescents of different ethnicities (Caucasian, Chinese or Vietnamese, Italian or Greek) and the influence different ethnicities had on body dissatisfaction and eating behaviour. There were no significant ethnic differences with respect to eating problems and body dissatisfaction. However, the Caucasian group experienced the greatest disturbed eating and body dissatisfaction and the Chinese group had the lowest ideal body size (Wang et al., 2005). Though there were no significant differences within this study, like the previous study it is the White or Caucasian females who had the greatest body dissatisfaction. Another study examining the differences in body image and eating habits of Australian and Chinese women found similar results (Lake, Staiger & Glowinski, 2000). That is, the Australian born women had greater body dissatisfaction than did the Chinese women (Lake et al., 2000). This led to the suggestion that body image was possibly not a key contributing factor to eating disorders in Chinese born women (Lake et al., 2000). In addition to other findings, Lake, Staiger and Glowinski (2000) found that both the Australian and Chinese women had similar attitudes towards eating. Sheffield, Tse and Sofronoff (2005) compared body-image dissatisfaction and eating disturbance amongst Australian and Hong Kong women, and found similar results to the other Chinese studies. Among Hong Kong women body image disturbance was not a key factor contributing to disordered eating (Sheffield et al, 2005). Together these studies suggest that Chinese have less body dissatisfaction compared to White females.

Conversely, in a study of body image satisfaction in participants of Chinese descent, Indo-Asian descent, and European descent, it was found that Chinese participants had the lowest body image satisfaction, were most concerned with their attractiveness, and the least satisfied with specific body parts (Kennedy, Templeton, Gandhi & Gorzalka, 2004). This implied that Chinese actually have greater body dissatisfaction than do other more Westernized ethnicities.

In addition to comparing Asian groups to Western groups, studies have also been conducted to examine disturbed eating and body dissatisfaction within the Asian population. For example, results showed that while Taiwanese and Japanese women both experienced body dissatisfaction it was the Japanese women who were most dissatisfied with their body image (Shih & Kubo, 2005). A comparison of female students from Japan, China, Taiwan, and Hong Kong residing in America found no significant differences for the mean EAT-26 total score (Stark-Wroblewski, Yanico, Lupe, 2005). However, those from Japan and Hong Kong had the most similar results overall, these two groups being the most influenced by Western cultures (Stark-Wroblewski et al., 2005).

Studies that have been conducted in China, have found different results from those conducted in Australia and America. For example, one study revealed that Chinese females displayed similar eating attitudes and body dissatisfaction to Western females (Lee & Lee, 1996). In addition, two other studies found amongst urban Chinese patterns of body dissatisfaction and drive for thinness similar to that found in Western societies (Li, Hu, Ma, Wu & Ma, 2005; Luo, Parish & Laumann, 2005). Finally, a study which compared Hong Kong beauty pageant contestants over 25 years, found that the preferred body shape was tall and slim (Leung, Lam & Sze, 2001). These results indicate that thinness has been an ideal in China for many years.

In fact another study of Chinese adolescent girls in Hong Kong discovered that 85.2% of the participants wanted to lose weight although the majority were already considered slim (Fung & Yuen, 2003).

Reviewing the literature on ethnicities and eating disorders highlights the fact that there is no firm answer as to which group experiences the most disordered eating and body dissatisfaction. Most of the literature which studied Chinese females living in different countries such as America and Australia, indicated that Chinese experienced similar levels of disordered eating but lower levels of body dissatisfaction to White females. However, studies conducted in China showed that Chinese preferred to be slim and were dissatisfied with their bodies. What is known is that these are issues for Asian and specifically Chinese populations.

Fear of Weight Gain

Fear of weight gain is one of the four essential DSM-IV criteria for a diagnosis of AN (American Psychiatric Association, 2000). However, research conducted on Asian populations, particularly Chinese, has indicated that this may not always be present. In a review of eating disorders in Asian societies, it was found that in countries such as China, Malaysia, Pakistan and India patients with AN often did not display fear of weight gain (Miller & Pumariega, 2001). Conversely, patients with AN in the more Westernised countries such as Japan, did in fact experience fear of weight gain (Miller & Pumariega, 2001). Another review also determined that within non-Western cultures a fear of weight gain did not necessarily have to be present for an eating disorder to develop (Soh et al., 2006). The more someone had been influenced by Western culture and society the more likely they were to display fear of weight gain (Soh et al., 2006).

An Australian study of Asian patients with AN and BN found that though the majority of patients expressed extreme fat phobia, some patients showed no sign of being afraid of weight gain (Rieger, Touyz, Swain & Beumont, 2001). Six of the patients had developed an eating disorder prior to their living in Australia, which the authors suggested could have been a reason for them not expressing fat phobia (Rieger et al., 2001). Many studies conducted in China have also discovered patients with AN who do not exhibit fat phobia (Lee, 1995; Lee & Lee, 2000; Lee, Ho & Hsu, 1993; Lee, Lee, Ngai, Lee & Wing, 2001). A major finding of one study, was that 58.6% of the Chinese patients with AN gave reasons other than fear of weight gain for their food refusal such as: stomach bloating, no appetite or hunger, or fear of food (Lee, Ho & Hsu, 1993). These results indicate that more than half of the patients with AN in Chinese hospitals, would not fit a Western diagnosis of AN because they did not fit the criteria.

A follow-up study researched reasons for food refusal in Chinese with AN (Lee, Lee, Ngai, Lee & Wing, 2001). Again two distinct groups were found, those with fat phobia and those without or non-fat phobics. One third of the patients were found to be non-fat phobic (Lee, Lee, Ngai, Lee & Wing, 2001). The most common reason for food refusal by the fat phobic group was fear of weight gain, while the most common reason for food refusal by the non-fat phobic group was stomach bloating (Lee, Lee, Ngai, Lee & Wing, 2001). Another study which researched patients with AN in Hong Kong found that 40% of the patients were considered as having atypical AN because they did not display a fear of becoming fat (Lee, Kwok, Liau & Leung, 2002). Once more, quite a high percentage of Chinese patients did not demonstrate fear of weight gain. This is further supported by a case study in China of a woman with AN, who had gone from 43kg to 32kg in seven years (Lee, 1995). This revealed that the woman

attributed her weight loss to the fact that she had no appetite or was too distressed to eat, no because she was afraid of being fat (Lee, 1995).

In contrast some studies suggest that fear of weight gain was an issue (Lee, 1996). Chinese university students and their eating attitudes and behaviours were researched in this study (Lee, 1996). Results of the study showed that female students were preoccupied with a desire to be thinner, and that they held similar ideals of thinness to Western females (Lee, 1996). This implied that Chinese females were just as fixated with their weight as Western females. A study which might explain these differing results compared female students from three different areas in China: Hong Kong, Shenzhen and rural Hunan (Lee & Lee, 2000). Students from Hunan were more likely to want to gain weight than the other two groups, while students from Hong Kong were most likely to want to lose weight (Lee & Lee, 2000). Even though students from rural Hunan had the highest BMI they were least likely to display fat phobia (Lee & Lee, 2000). Therefore, Chinese living in urban areas are more likely to exhibit fear of weight gain.

From studying the literature it is clear that whether Chinese experience fat phobia is an issue. The only difference between the contrasting studies was that, when fear of weight gain was not prevalent studies used adults participants, while when it was an issued student participants were used. This suggests that different factors need to be taken into account when assessing for eating disorders with Chinese.

Chinese, Family and Pressure to be Thin

Studying the literature on eating disorders and Chinese has highlighted certain areas of interest, one of which is the role family plays in pressure people feel to be thin. In a study of Asian-American women mentioned previously, their parents were

perceived to be less caring than Caucasian women's parents (Haudek, Rorty & Henker, 1999). Parents perceived as caring less was also associated with more disturbed eating (Haudek et al., 1999). Therefore Asian-American women actually had greater disturbed eating because they felt their parents cared less for them than did Caucasian women's parents.

Families may also influence disordered eating within the Chinese population. Lee and Lee (1996) found that family cohesion as well as family conflict predicted disordered eating. They suggested that family unity was very important to Chinese culture, therefore they proposed that such an overprotective environment may lead to disordered eating in some adolescents who endeavour to have control over their lives. Thus, family cohesion plays an important role in eating disorders in China.

Another study which compared Australian and Thai university students, found that pressure to be thin was greater in Thailand than in Australia (Jennings, Forbes, McDermott, Hulse & Juniper, 2006). The Thai students had higher scores on the Ineffectiveness, Interpersonal Distrust, Maturity Fears and Social Insecurity subscales of the EDI (Jennings et al., 2006). The authors suggested that this was partly due to Asian female students having overprotective parents, getting less encouragement to be independent and cultural change creating conflict with their parents (Jennings et.al., 2006).

Good interpersonal relationships within Chinese families are very important and an essential value of Chinese society (Ma, 2005). Within China there is a social stigma attached to mental illness, so for a family to admit there is a problem is difficult due to the shame they may experience (Ma, 2005). Chinese with disordered eating and body dissatisfaction may feel pressure from their family to maintain a

certain image to the world, one where everything is alright and they are happy and healthy.

Thus the literature suggests that family is very important to Chinese. However, Chinese families may actually contribute to a person developing an eating disorder because there is pressure on the person to look and be good as they are role models for the family.

Acculturation

According to some research the length of time Asian people live in Western countries relates to the levels of disordered eating and body dissatisfaction they experience. For example, Australian-born women had the greatest eating disorder symptomatology compared to those born elsewhere (Ball & Kenardy, 2002). However, they also found that women who had been living in Australia longer, including Asian women, had body dissatisfaction and eating behaviours which closely resembled those of the Australian-born women (Ball & Kenardy, 2002). Therefore, the more time non-Western women spent living in a Western country the more their disordered eating behaviours and body dissatisfaction attitudes resembled that of Western women. However, in Canada this does not appear to the case as Chinese participants who had recently moved to Canada were actually more dissatisfied with their bodies than those who had lived there longer (Kennedy, Templeton, Gandhi & Gorzalka, 2004). Therefore, living in a Western country essentially decreased Chinese participants' levels of body dissatisfaction.

A review looking Taiwanese living in America and Taiwan also found some interesting results (Soh et al., 2006). They found it was actually the Taiwanese women living in Taiwan who experienced the greatest disordered eating and body

dissatisfaction (Soh et al., 2006). However, this review also suggested that the more someone had been influenced by Western culture and society the more likely they were to display fear of weight gain (Soh et al., 2006). Therefore, although Taiwanese living in their own country experienced the highest eating disorder symptomatology, those who had been influenced more by Western society displayed fear of weight gain. This indicates that time spent in Western countries may alter which symptoms of disordered eating are displayed.

However, not all studies have found a link between acculturation and disordered eating. A meta-analytic review of disordered eating, body dissatisfaction and ethnicity found no significant relationship between acculturation and disordered eating (Wildes & Emery, 2001). That is women who were acculturated and women who were not acculturated did not differ significantly in their eating pathology (Wildes & Emery, 2001). Thus, it was concluded that acculturation did not have a significant role in disordered eating.

Reviewing the literature indicates varied ideas about the importance of acculturation when looking at ethnicities and eating disorders. On one side the longer a non-Western person stays in a Western country the more likely they are to have similar eating disorder symptomatology to Western people, including fear of weight gain (Ball & Kenardy, 2002; Soh et al., 2006). Conversely, the longer a non-Western person stays in a Western country could actually decrease their levels of body dissatisfaction (Kennedy et al., 2004). Finally, length of time spent in a Western country could have no effect at all on a persons disordered eating (Wildes & Emery, 2001). Of particular interest here are the Australian studies as their results are most applicable to New Zealand.

Western Diagnostic Measures

An issue which arose while studying the literature on eating disorders and Asian or Chinese was the appropriateness of Western diagnostic measures. The prevalence of diagnosable eating disorders in non-Western countries is relatively low (Cummins et al., 2005; Wildes & Emery, 2001). A reason for these low prevalence rates could be due to the failure of Western diagnostic tools, such as the DSM-IV, to take into account the differences of non-Western people (Cummins et al., 2005; Miller & Pumariega, 2001; Wildes & Emery, 2001). DSM criteria for eating disorders may exclusively refer to Western classifications, especially regarding fear of weight gain (Lake et al., 2000).

Studies have provided evidence for Chinese not fitting within Western criteria for a diagnosis of an eating disorder. Many studies undertaken in China have found two distinct groups of people with eating disorders, fat phobics and non-fat phobics (Lee, 1995; Lee, Ho & Hsu, 1993; Lee, Kwok, Liau & Leung, 2002; Lee, Lee, Ngai, Lee & Wing, 2001). The earliest study, Lee, Ho and Hsu (1993), to discover this phenomenon found that a group of Chinese patients did not fit within the Western based DSM-III diagnosis of AN because they did not display one of the essential criteria; an acute fear of gaining weight.

Further evidence as to the appropriateness of Western measures can be provided by Chinese studies which used Western-based diagnostic measures, particularly the EAT. A case study mentioned in an earlier section of a Chinese female with AN, used the EAT-40 as a diagnostic tool (Lee, 1995). The woman's score on the EAT-40 was 23, which was well below the cut-off of 30 for a diagnosis of AN (Lee, 1995). However, there was no physical cause which accounted for the woman's weight loss which was severe (Lee, 1995). Hence, only using a Western-based diagnostic tool

such as the EAT-40 would have meant that a diagnosis of AN would not have been found (Lee, 1995). Another study looked at the EAT-26 as a screening measure for Chinese patients with eating disorders in Hong Kong (Lee, Kwok, Liau & Leung, 2002). Again there were two groups of patients, those with fat phobia and those without. The patients who were non-fat phobic had a mean EAT score which was only slightly higher than that of a community sample. Plus, 41.5% of the patients with fat phobia also scored below the EAT-26 cut-off of 20 (Lee, Kwok, Liau & Leung, 2002). Therefore, nearly half of the patients with typical AN scored below the cut-off point for a diagnosis of AN using a Western-based measure (Lee, Kwok, Liau & Leung, 2002). From looking at these studies it is clear to see that many Chinese patients could potentially be misdiagnosed using Western-based diagnostic measures.

BMI is another important diagnostic tool for diagnosing eating disorders. Conventionally for a person to have a normal weight status they must have a BMI between 18.5 and 24.9 (WHO, 2003). However, recently the Singapore government have revised the BMI cut-off scores in Singapore (Health Promotion Board, 2005). Singapore government's Health Promotion Board (2005) have changed the BMI cut-off for a healthy person from 24.9 to 22.9. This change was brought about because studies have shown that many Asian populations have a higher proportion of body fat compared to Western populations. Thus looking at previous research demonstrates the fact that using Western measures to screen Chinese and other Asian populations for eating disorders may need further consideration.

Reasons for Study

In reviewing the literature concerning Asian populations and eating disorder symptomatology many inconsistencies and issues have been introduced. Even though

research in this area is still relatively new it has been established that Asian people do experience disordered eating and body dissatisfaction. However, the extent to which they experience these concepts is still open to debate. It has also been shown that in order to better understand Asian populations it is necessary to study them within their separate ethnicities such as Chinese. Most of the studies conducted to date have been based in either America, Australia or China. No published studies have been conducted in a New Zealand setting. Therefore, this study will examine Chinese females living in New Zealand and compare them with females of other ethnicities living in New Zealand to determine if there are any differences in disordered eating and body dissatisfaction between them.

From a review of the previous literature a major issue is that Chinese have two separate groups of patients with AN, those who experience fear of weight gain and those who do not. It also seems that the more a Chinese person is influenced by Western ideals the more likely they are to experience fear of weight gain. Another issue is the role family plays in Chinese who have eating disorders. Family is very important to Chinese society and people may feel pressure to behave in a way which maintains that respect and loyalty to family values. A further issue which has arisen from reviewing the literature is whether or not using Western screening measures are suitable for Chinese. It seems that using measures such as the EAT for Chinese may actually miss diagnose some people as not having an eating disorder.

Thus, the aim of this thesis is to examine the following hypotheses which have been derived from the literature review:

1) Chinese females experience similar levels of disordered eating but less body dissatisfaction than do females of other ethnicities living in New Zealand.

2) Chinese females are less likely than females of other ethnicities in New Zealand to assign fear of weight gain as a reason for their disordered eating.

3) Pressure to be thin comes from different sources for Chinese females compared to other females in New Zealand. Chinese females will be more likely to feel pressure from their family to be thin.

4) There will be a difference in the levels of disordered eating and body dissatisfaction for Chinese females depending on how long they have been living in New Zealand. Chinese females that have been living in New Zealand longer will have similar levels of disordered eating and body dissatisfaction to those of females of other ethnicities living in New Zealand.

5) Using the EAT as a screening measure for eating disorders is not appropriate for use amongst Chinese female populations.

Method

Focus Groups

In order to find out the eating patterns of both Chinese females and females of other ethnicities in New Zealand focus groups were carried out.

Participants

The Chinese focus group was made up of three females from different areas in China who had been in New Zealand 3-5 years. Their age ranged from 25-27 years. The New Zealand focus group included three females of European descent all of whom were born in New Zealand. Their age ranged from 25-29 years. The participants recruited for both focus groups were friends of the author who agreed to participate in the study. The Chinese focus group met at one of the Chinese participants' house, and the New Zealand focus group met at one of the New Zealand participants' house.

Measures

Each focus group was asked six questions relating to what they ate, when they ate and whether this was typical of people in their home country. For example each group was asked "What sort of food did you usually eat for breakfast, lunch and dinner." Each participants dinner was weighed prior to them eating it, and questions were asked after they had finished their meal. The questions used are given in Appendix A.

Procedure

Ethical approval was obtained from the University of Waikato, Department of Psychology Ethics Committee. Once ethical approval had been obtained, two focus groups were run. The focus groups were held one week apart with the Chinese group being first. Both groups started at 6.30pm, just before dinner. The Chinese group ate a

typical Chinese dinner with: steamed fish, rice, and a couple of meat and vegetable stir-fry dishes. The New Zealand group had vegetarian Lasagne (one of the participants was vegetarian). These meals were self selected by the participants of each focus group. Prior to eating the author used a set of kitchen scales to weigh each participants meal, the same set of scales was used for each focus group. Each participant's plate was first weighed without the food and then weighed again with the food on it. Only the main meal was weighed, not dessert or any drinks had. After eating dinner participants were asked six questions relating to what they ate and whether this was typical of people in their home country (China or New Zealand). Results from the focus groups showed that while Chinese eat a lot more rice and noodles than New Zealanders, they both eat approximately the same amount for a main meal. Also, both groups have three main meals in a day with snacks in between. Once the normal eating habits of Chinese females and New Zealand females were documented the main study began.

Main Study

Participants

Participants were recruited by placing posters around the campus at the University of Waikato. See Appendix D for a copy of the poster.

Participants for the main study were 117 female students from the University of Waikato. Specifically students from the Department of Psychology participated, as well as students from the Management School and the Language Institute. It was necessary to gain participants from both the Management School and Language Institute, because they have a large number of Chinese students who were needed for this study. Participants ranged in age from 18 to 47. Of the 117 female participants 71

were in the New Zealand and Other ethnicities group and 45 were in the Chinese group. One participant's results were discarded as they had not stated their ethnicity. Therefore, there were 116 participants. The Other ethnicities group consisted of: 57 NZ Europeans, 9 NZ Maori, 1 Pacific Islander and 4 participants of Other Ethnicities. The Chinese group consisted of 39 participants who identified themselves as Chinese, and 6 participants who identified themselves as Other Ethnicities. For the purpose of data analysis these 6 participants were included in the Chinese group because they came from Taiwan. Fourteen of the Chinese group filled in an English version of the Questionnaire, and 31 filled in a Chinese version.

Measures

A questionnaire was developed which assessed disordered eating, body dissatisfaction, fear of weight gain and pressure to be thin. All measures used for this questionnaire not developed by me, have been taken from the original articles without any changes being made. Therefore, the measures used can be viewed in the questionnaire in Appendix B or C (in Chinese).

Eating Attitudes Test. The Eating Attitudes Test (EAT-40) is a 40-item questionnaire developed by Garner and Garfinkel (1979). This 1979 version was used in this study. The EAT-40 was developed as a rating scale to help evaluate behaviours and attitudes found in people with Anorexia Nervosa (AN). Later a shorter 26-item version of the EAT was developed using a subset of items from the EAT-40 (Garner, Olmstead, Bohr & Garfinkel, 1982). The scale used for the EAT is a 6-point scale ranging from 'Never' to 'Always'. A cut-off score of 30 or above for the EAT-40 indicates AN, while a cut-off score of 20 or above for the EAT-26 also indicates AN. There are seven subscales within the EAT-40: food preoccupation, body image for thinness, vomiting and laxative abuse, dieting, slow eating, clandestine eating, and

perceived social pressure to gain weight (Garner & Garfinkel, 1979). Which items loaded on each subscale was not listed in the original article. The EAT-40 has excellent internal consistency with an alpha of 0.94 for a combined sample of female patients with AN and a female control group, while the internal consistency of the female patients with AN alone was also good at 0.79 (Garner & Garfinkel, 1979). Within the EAT-26 there are three subscales: dieting which relates to avoiding food that can be fattening, bulimia and food preoccupation looking at bulimia related behaviour such as vomiting, and oral control relating to how much self-control someone has around food (Garner, Olmsted, Bohr and Garfinkel, 1982). 26 items from the EAT-40 relate to these subscales, for the dieting subscale there are thirteen items: 4, 9-10, 14-15, 22, 25, 29-30, and 36-39. There are six items for the bulimia and food preoccupation subscale: 6-7, 13, 31, 34, and 40. While with the oral control subscale there are seven items: 5, 8, 12, 24, 26, and 32-33 (Garner, Olmsted, Bohr and Garfinkel, 1982). The EAT is a commonly used measure in research of eating disorders and disordered eating. Other researchers looking into cultural differences in disordered eating have also used the EAT as part of their study (Fung & Yuen, 2003; Lake, Staiger & Glowinski, 2000; Wang, Byrne, Kenardy & Hills, 2005). The EAT was included in this study firstly because it was necessary to compare the results of this study to previous research in this area. Although the EAT was designed for use in a clinical sample it can be used in a non-clinical sample as a broad measure of disturbed eating habits (Stark-Wroblewski, Yanico & Lupe, 2005). Therefore, was useful in this study to compare the eating habits of the two cultural groups. The forty EAT items used were items 51 to 90 in the questionnaire in Appendix B or C.

Eating Disorder Belief Questionnaire. Two subscales of the Eating Disorder Belief Questionnaire were used; this questionnaire was developed in 1997 by Cooper,

Cohen-Tovée, Todd, Wells and Tovée. This self-report questionnaire was designed as a way to assess people with AN's beliefs about themselves, their bodies and what they think other people feel about them (Cooper, Cohen-Tovée, Todd, Wells & Tovée, 1997). The two subscales used in this study were Acceptance by Others with 10-items and Self-acceptance with 6-items. These two subscales were included, because it was necessary to understand how the participants perceived their bodies and how they were affected by their appearance. Cronbach's alpha for the factors Acceptance by Others and Self-acceptance is 0.95 and 0.90 respectively, indicating good internal consistency of each factor (Cooper et.al., 1997). This measure also showed good convergent validity, with a sample of 254 female university students and staff, giving significant correlations between the four subscales and the Eating Attitudes Test, Body Shape Questionnaire and Dutch Eating Behaviour Questionnaire, using Pearson correlations. Concurrent validity was also good for this test. The questionnaire was given to three groups: groups 1 and 2 were female patients with a diagnosis of AN or BN using DSM-III-R criteria, while group 3 consisted of a control group of females without an eating disorder. The patient groups scored significantly higher than the control group, having a much higher mean score for each subscale (Cooper et.al., 1997). The two subscales relate to items 23 to 38 in the questionnaire in Appendix B or C.

Twelve Items based on Eating Disorder Belief Questionnaire. The two subscales taken from the Eating Disorder Belief Questionnaire were also used as a basis to develop twelve additional questions. The questions focus on how family is affected by the participant's weight, rather than how the participants themselves are affected. Thus the additional questions assessed how the participants' weight and looks affect

their family. The twelve additional questions are items 39 to 50 in the questionnaire in Appendix B or C.

Perceived Sociocultural Pressure Scale. The Perceived Sociocultural Pressure Scale developed by Eric Stice was also used (Stice, 2001). This scale was developed to assess the amount of pressure to be thin participants perceived from family, friends, dating partners and the media (Stice, 2001). It was originally an 8-item 7-point response scale rating from 'none' to 'a lot', but the version used in this study was 10-items on a 5-point response scale rating from 'none' to 'a lot' (estice@ori.org, 2006). Internal consistency of the original version of the measure was 0.88, two week test-retest reliability was r = 0.93, and this measure also had adequate predictive validity (Stice, 2001). Therefore this measure has good reliability and sufficient predictive validity so that it could be used in this study to examine the concept of pressure to be thin. The ten items from this scale are items 13 to 22 in the questionnaire in Appendix B or C.

Demographic Information. Seven demographic items were used asking participants for their: age, ethnicity, if they were born in New Zealand or how long they had lived in New Zealand, current height, current weight, lowest weight in three years, and highest weight in three years. Participants were asked to self-report their current height and weight so that a Body Mass Index (BMI) could be calculated. Body Mass Index is defined as weight (kilograms) divided by the square of the height (metres) and is a means of signifying weight status in adults (World Health Organisation, 2006). BMI was useful for comparing the weight status of the two groups. Much of the previous research found in this area used BMI as part of their research. Thus BMI was also useful for comparing results across studies.
The seven items are the first items found in the questionnaire in Appendix B or C.

Additional Information. Some of the additional items were taken from existing measures. These included two items from the Short Evaluation of Eating Disorders (Bauer, Winn, Schmidt & Kordy, 2005). The SEED is a 6-item measure developed to assess key symptoms of eating disorders (Bauer et.al., 2005). The first item of the SEED used in this study asked if participants were "afraid of becoming fat or gaining weight" on a 5-point scale from 'not at all' to 'constantly.' The second item used asked participants how they perceived their body, for example "much too thin" or "much too fat", on a 5-point response scale. The SEED was compared with the Eating Disorder Inventory and the relationships found were in the expected direction, indicating good construct validity. Also, the SEED displayed good criterion-related validity thus it discriminates between "ED patients and non-patients" (Bauer et.al., 2005).

Body image figures developed by Stunkard, Sorenson & Schulsinger (1983), were used in this study to see what type of figure represented the participants' ideal weight. The figures were on a 1 to 9 scale, with 1 being the slimmest figure and 9 being the heaviest figure.

Participants were also asked questions regarding: how often they weighed themselves, how many main meals the ate in a day, whether the think they eat more or less than their peers, if they snacked on food and what type of food they snacked on, if they avoided certain foods and why, if they ever turned down or did not complete a meal and why, and if they wanted to be thin and why. This information was necessary to gain an understanding of who the different groups were, what their disturbed eating habits were, and to discover whether or not their reasons for food refusal were different. The additional items relate to items 1 to 12 in the questionnaire located in Appendix B or C.

Procedure

Questionnaires were translated into Chinese with the help of a Chinese friend of the author, so they could be provided in both English and Chinese (Mandarin). Once the translation was completed a Lecturer from the East Asian studies department at the University of Waikato checked the translation to make sure that the best possible translation was provided. It was necessary to have both English and Chinese translations because there were to be some participants who had only been in New Zealand a short period of time; therefore they would not read or speak English very well. Completing a Chinese version of the questionnaire meant that participants should have understood what was being asked. See Appendix B for an English version of the questionnaire and Appendix C for a Chinese version of the questionnaire.

Next posters were put up around the University. The posters and questionnaires were printed in both English and Chinese (Mandarin). Posters informed students about the study, stated who was eligible for the study, how long it would take and where participants could get them from. Appendix D gives a copy of the poster.

Participants were eligible for this study if they were: female, Chinese or any other ethnicity living in New Zealand and students at the University of Waikato. Those participants who were first year Psychology students gained a 1% course credit for contributing their time to the study.

Students interested in participating were asked to collect questionnaires from and return them to a number of central locations. However, as the study progressed it became apparent that few Chinese participants were being recruited via the posters. Thus, other methods of recruitment were also employed. This included handing out Chinese versions of the questionnaire in classes in the Language Institute. The author

also went around the campus handing out questionnaires to Chinese females asking them to fill them in and drop them off at one of the boxes located around the Campus. Finally, the Language Institute located at the Tauranga Campus of the University of Waikato was contacted and one more Chinese participant was recruited from there.

The data from the completed questionnaires were entered into SPSS version 12.0 for analysis.

Questionnaire Scoring

All the raw data from the questionnaires collected were entered into SPSS 12.0. Questions 6, 7, 8, 11 and 12 could have more than one response so this data was manually collated into frequency tables. Once the data was entered into SPSS some of the responses had to recoded to be able to be scored. Items 10a to 10d were part of the SEED and had to be recoded for scoring. To score items 10a to 10d participants needed to have a BMI score in order to obtain a final score. The response scores of 1 = much too thin, to 5 = much too fat corresponded to a reference BMI which initially treats participants as if they have no distortion of body perception. The BMI ratings which scores corresponded to were: 1 = BMI of 14, 15, 16; 2 = BMI of 17, 18, 19; 3 = BMI of 20, 21, 22; 4 = BMI of 23, 24, 25; and 5 = BMI of 26. The lowest BMI reference score for each category was used for this study, therefore 1 = 14, 2 = 17, 3 = 20, 4 = 23 and 5 = 26. Finally to obtain a final score the difference between actual and reference BMI is found. If the difference is bigger than -2 there is no distortion of body perception and the final score is 0. A difference between -2 and -4 = 1, difference between -4 and -6 = 2, and a difference greater than -6 = 3 indicating severe distortion of body perception. Items 51 to 90 also had to be recoded to obtain a final EAT score. Items 51, 68, 69, 73, 77 and 89 were recoded as follows: 1 = 3, 2 =

2, 3 = 1 and 4, 5, 6 = 0. All the remaining items of the EAT were recoded to: 6 = 3, 5 = 2, 4 = 1 and 3, 2, 1 = 0.

In order to be able to analyse the data, final scores for the measures used had to be obtained. Items 13 to 22 were added together to get a Perceived Sociocultural Pressure Scale final score. For the two subscales of the Eating Disorder Belief Questionnaire and the twelve additional items developed by me, pertaining to how family are affected by an individual's appearance, the mean score of each participant was found for the final score. That is: for items 23 to 32 a mean score was obtained for the Acceptance by Others subscale; for items 33 to 38 a mean score was found for the Self-Acceptance subscale; and for items 39 to 50 a mean score was found the Family items. Finally items 51 to 90 were added together to obtain an EAT-40 final score, while items 54-60, 62-65, 72, 74-76, 79-84, 86-90 were added together to obtain and EAT-26 final score. Before starting the analysis a new variable was added where participants were split into two groups Chinese and Other Ethnicities in New Zealand so that their responses could be compared.

Results

Focus Group Results

Both the Chinese and New Zealand focus group participants reported that they had three main meals a day, apart from one participant in the New Zealand focus group who only had two. However, the Chinese and New Zealand groups reported eating different food for their main meal. The Chinese group ate mostly rice and noodles with a selection of two to three vegetable and meat dishes, which were usually stir fried. The New Zealand group generally ate cereal and toast for breakfast, sandwiches for lunch, and dinner usually involved pasta or potatoes with meat and vegetables, except for the vegetarian group member who did not eat meat. Conversely, the two groups ate similar snack foods such as: fruit, biscuits, crackers, chocolate and other sweet items. Both groups felt that their eating habits were generally typical of other people in their country.

Each focus group was held during the evening at one participants home so that their main meal could be weighed. For the Chinese group the three members' dinners weighed: 310g, 400g and 330g. The New Zealand group members' dinners weighed: 300g, 300g, 375g. All participants ate everything on their plates. Thus, both groups ate similar amounts during a main meal.

Overall results of the focus group suggest that although the Chinese consume different foods for dinner they eat similar amounts and also eat similar snack foods to other participants living in New Zealand. Thus, as eating patterns and habits are generally similar between the two groups, it is unlikely different eating patterns will confound results of the main study.

Main Study Results

Descriptive Data

As described in the method, 116 females completed this study, 45 Chinese and 71 participants of Other ethnicities living in New Zealand (or Other participants). Not every participant completed all the measures, but their data were excluded only from the measures they missed and not from the whole study. This resulted in different N's for each of the demographic measures.

Table 1. Demographic Information for Chinese and Other Ethnicities.

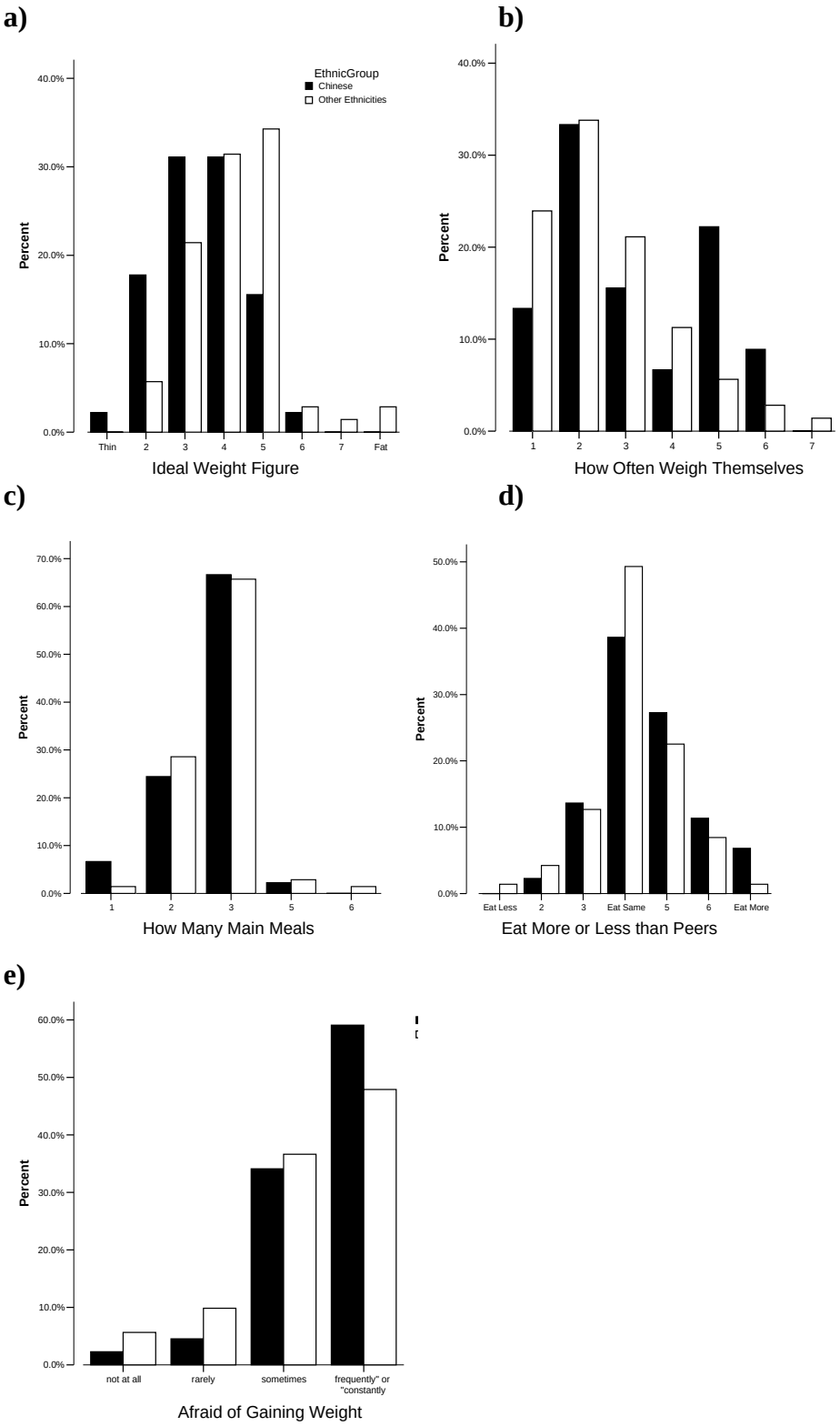
	Chinese			**Other**		
	N	**Mean(SD)**	**Range**	**N**	**Mean(SD)**	**Range**
Age (years)	36	24.19(3.51)	19-36	68	24.12(8.66)	18-47
Time in NZ (months)	43	28.44(46.15)	1-276	71	267.92(115.51)	2-564
BMI	44	21.41(3.00)	14.92-28.89	63	23.56(3.12)	17.93-32.89
Lowest Weight in 3 years (kg)	44	51.04(6.98)	38.20-72.00	68	60.00(9.50)	42-78
Highest Weight in 3 years (kg)	43	59.59(9.14)	39.10-80.00	67	69.63(11.67)	48-110

Demographic data are summarized in Table 1. It can be seen that both groups were of similar ages. As expected, the majority of Other female students had been born in New Zealand, as shown by a mean of 267.92 months or 22.32 years for time spent in New Zealand. In contrast, the Chinese female students had on average, lived in New Zealand for only 28.44 months or 2.37 years. In addition, the two groups differed in terms of weight; with the New Zealand group being on average approximately 10kg heavier than the Chinese participants.

The additional information provided by questions 1 to 12 have been summarized. These items ask participants: their ideal weight figure, how often they weigh themselves, how many main meals they eat in a day, if they eat more or less than their peers or friends, what they snack on, types of foods they avoid and why, if they are afraid of gaining weight, how they perceive their bodies, why they might turn down or not complete a meal, and why they want to be thin.

All 71 of the Other ethnicities living in New Zealand group snacked on food between main meals at least sometimes. While, 39(88.4%) of the 44 Chinese who answered this question stated they snacked between main meals. The most common foods to snack on were fruit for both groups with 56(78.8%) of the New Zealand group and 43(97.7%) of the Chinese group choosing this as one of their options. Both Chinese females and Other females snacked on a variety of foods.

Figure 1 shows the distributions of responses for both Chinese and Other females for five of the individual items in the questionnaire. Figure 1a) represents the distribution of responses for female students for their ideal weight figure. Figure 1b) shows how often Chinese females and the Other females weighed themselves. Figure 1c) provides information about how many main meals each group ate in a day. Figure 1d) is looking at whether the participants felt they ate more or less than their friends or peers. Figure 1e) shows a distribution of whether participants are afraid of gaining weight. All of the figures use different scales, but an additional note at the bottom of Figure 1 provides information on how to read the scales.

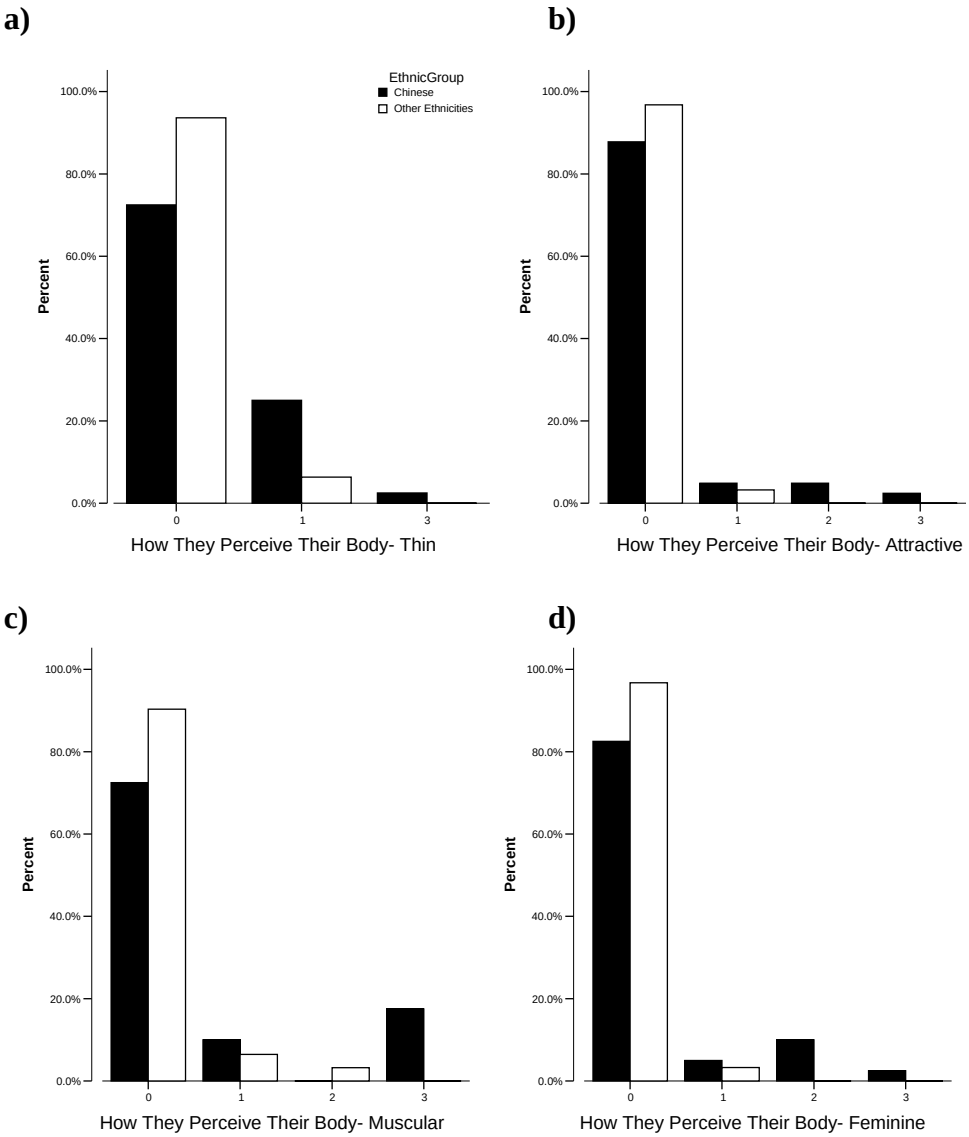


Note. Figure **a)** 1 to 8 scale: 1=slimmest figure, 8=largest figure chosen. Figure **b)** 1 to 7 scale: 1=almost never, 2=few times per year, 3=1-3 times per month, 4=once a week, 5= more than twice a week, 6=once a day, 7=more than once a day. Figure **c)** scale relates to number of main meals eaten. Figure **d)** 1 to 7 scale: 1=eat a lot less than my peers, 4=eat the same amount as my peers, 7=eat a lot more than my peers.

Figure 1. Distribution Figures of Chinese and Other Ethnicities for Five Items.

Figure 1 indicates that Chinese females chose slimmer ideal weight figures to the Other females. More than 30% of Chinese participants weighed themselves twice a week or more, while only about 10% of Other participants weighed themselves this often. Both groups ate a similar number of main meals in a day, three main meals in day was the most common amount. Distribution of whether participants considered themselves as eating more or less than their peers was comparable for both groups, with the majority of participants indicating they ate similar amounts to their peers. Distributions of how afraid of becoming fat participants were indicated similar results for both groups, with most participants showing they were ‘frequently’ or ‘constantly’ afraid. However, slightly more Chinese females than Other females indicated they were more afraid of gaining weight, nearly 60% of Chinese and just less than 50% of Other females choose ‘frequently’ or ‘constantly’ for this question.

Figure 2 shows the distribution of responses to question 10. Figures 2a), 2b), 2c) and 2d) relate to item 10 in the questionnaire, about how participants perceived their bodies where participants obtained a score for distortion of body perception. Scores over 0 indicated distortion of body perception, with a score of 3 indicating severe distortion of body perception. For figures a), b), c), d), most participants from both groups obtained a score of 0, indicating no distortion of body perception. Yet, for all of these items more Chinese females obtained scores higher than 0 which indicated they experienced greater distortion of body perception than Other females.



Note. Figures **a)**, **b)**, **c)**, and **d)** scales: 0=no distortion of body perception, 3=severe distortion of body perception.

Figure 2. Distribution Figures of Chinese and Other Ethnicities for Question 10.

The internal consistencies of the structured measures used for this study were also obtained to investigate the reliability of each measure. The internal reliability as measured by Cronbach's Alpha for each of the measures used for this study are shown in Table 3, and all exceeded .80.

Table 2. Cronbach's Alpha Scores.

	SEED – Perceive Body	PSPS	EDBQ – Others	EDBQ – Self	EDBQ – Family	EAT-40	EAT-26
Cronbach's Alpha	.814	.848	.920	.858	.941	.860	.859

Note. SEED – Perceive Body, Short Evaluation of Eating Disorders four items on how they perceive their bodies; PSPS, Perceived Sociocultural Pressure Scale; EDBQ – Others, Eating Disorder Belief Questionnaire acceptance by others subscale; EDBQ – Self, Eating Disorder Belief Questionnaire self-acceptance subscale; EDBQ – Family, twelve items based on the EDBQ relating to family acceptance; EAT-40, Eating Attitudes Test forty items; EAT-26, Eating Attitudes Test twenty six items.

The next part of the results section consists of analysis conducted specifically to address each of the research hypotheses.

Hypothesis One: Chinese experience similar levels of disordered eating but less body dissatisfaction than do other ethnicities living in New Zealand.

Several different measures were used to address the first hypothesis of this study. These were: BMI, ideal weight figures, how often they weighed themselves, four items taken from the SEED asking how participants perceive their bodies, subscales Acceptance by others and Self-acceptance taken from the EDBQ, twelve items based on the EDBQ relating to family acceptance, EAT-40, EAT-26 and finally the EAT-26 Dieting subscale. Of these measures the EAT-40, EAT-26 and the Dieting subscale of the EAT-26 all help to analyse disordered eating within the two groups. While the other measures mentioned examine body dissatisfaction for both groups.

Tests for normality were conducted on all measures. As some failed to meet normality assumptions, both independent groups t-tests and the non-parametric equivalent, the Mann-Whitney test, were conducted between the Chinese and Other groups for each of the measures described above. In addition, effect sizes were also calculated, Cohen's d, where 0.2 = small effect, 0.5 = medium effect, and 0.8 = large

effect (Cozby, 2007). As analysis revealed similar results using either parametric or non-parametric tests, the results from the independent-samples t-test are reported here.. In addition, the Levene's test for variances assumed was checked with some of the measures having variances unassumed. Thus, the different degrees of freedom differ for some of the results. One-tailed t-tests were conducted as the direction of the difference was indicated in the hypothesis. Results of these t-tests and the associated effect sizes are summarized in Table 3.

These t-test results indicated significant differences between the responses of the Chinese and Other participants, for the measures used in this study specifically relating to disordered eating and body dissatisfaction. It can be seen that the Other ethnicities group had both a significantly larger BMI, and self identified with a larger ideal weight figure compared to the Chinese with medium to large effect sizes. For all of the other measures the Chinese participants scored significantly higher than the Other ethnicities. Thus, Chinese participants weighed themselves significantly more often than did other ethnicities, small to medium effect of 0.42, and scored significantly higher for the four SEED items relating to how they perceived their body. A higher score on how they perceived their bodies indicated greater levels of distortion of body perception. All had a medium effect except of how attractive participants perceived their bodies, which showed a small to medium effect. In addition, the Chinese participants scored significantly higher on the two Eating Disorder Belief subscales and the twelve questions based on the EDBQ relating to family. The Acceptance by Others subscale of the EDBQ had the highest effect size with 0.96, indicating a large effect. While the Self-Acceptance subscale and the family related questions had medium to large effect sizes. All of the above mentioned measures relate to body dissatisfaction and all showed a significant difference in

scores for Chinese and Other. So, Chinese females were more dissatisfied with their bodies.

Table 3. Independent-Samples t-test Results Pertaining to Hypothesis One.

Measure	Chinese		Other		t-test (one-tailed)	Effect Size -Cohen's d
	N	Mean(SD)	N	Mean(SD)		
BMI	44	21.41(3.00)	63	23.56(3.12)	t(105)= 3.56 *	0.70
Ideal Weight	45	3.47(1.10)	70	4.23(1.21)	t(113)= 3.42 *	0.66
How Often Weigh Themselves	45	3.18(1.63)	71	2.55(1.39)	t(83)= -2.14 *	0.42
Perceive Body-Thin	40	0.33(0.62)	63	0.06(0.25)	t(47)= -2.56 *	0.57
Perceive Body-Attractive	41	0.22(0.65)	62	0.03(0.18)	t(44)= -1.79 *	0.40
Perceive Body-Muscular	40	0.63(1.15)	62	0.13(0.42)	t(46)= -2.62 *	0.58
Perceive Body-Feminine	40	0.33(0.76)	61	0.03(0.18)	t(42) = -2.38 *	0.54
EDBQ- Others	45	31.43(17.86)	71	14.64(17.19)	t(114)= -5.05 *	0.96
EDBQ- Self	45	66.09(17.80)	71	51.00(25.72)	t(113)= -3.73 *	0.68
EDBQbased-Family	45	20.23(19.29)	71	9.12(10.55)	t(61)= -3.54 *	0.71
EAT-40 Total Score	44	18.16(9.72)	71	13.86(12.55)	t(113)= -1.94 *	0.28
EAT-26 Total Score	44	12.19(8.40)	71	8.60(9.95)	t(113)= -1.99 *	0.38
EAT-26 Dieting subscale	44	7.90(6.01)	71	5.56(6.98)	t(113)= -1.84 *	0.36

*p<.05

The two EAT total scores, and the EAT-26 Dieting subscale showed significant differences between the two groups, with the Chinese participants scoring more highly than the Other participants for these measures, small to medium effect sizes. These three EAT scores were looking at disordered eating within the two groups. Therefore Chinese females had more disordered eating than the Other females. While the Chinese scored significantly higher on the EAT measures, the two average total scores were not above the cutoff for a diagnosis of an eating disorder. For the EAT-40 the cutoff score is 30 or above, with the Chinese average being 18.16. Of the Chinese participants 15.9% scored above the EAT-40 cutoff score, while 11.3% of the Other participants scored above the cutoff of 30. The EAT-26 cutoff score is 20 and the Chinese average was 12.19. Although the Chinese had a significantly higher average score for the EAT-26, slightly more of the Other participants (16.9%) scored above the cutoff (16.9% for the Others versus 15.9% for the Chinese).

Thus, analysis for Hypothesis One suggest that Chinese scored significantly higher on all of the measures relating to disordered eating and body dissatisfaction, and therefore had higher levels of disordered eating and body dissatisfaction than Other females.

Hypothesis Two: Chinese are less likely than other ethnicities in New Zealand to assign fear of weight gain as a reason for their disordered eating.

There were a number of measures used to answer Hypothesis two. Firstly, how often they weighed themselves was analysed. Next, participants were asked if they avoided certain types of food and the reasons they avoided these foods. Participants were also asked if they ever turned down or did not complete a meal and their reasons for this. This was to see if different responses were found to the reasons they avoided

foods. Finally, whether participants were afraid of becoming fat was directly analysed.

Referring back to Figure 1b) shows that Chinese female students' weighed themselves more often than Other female students. Chinese on average weighed themselves 1-3 times per month, compared to Other female students who only weighed themselves an average of a few times per year. Furthermore, 22.2% of the Chinese participants weighed themselves more than twice a week, compared to only 5.6% of the Other female participants.

Participants were asked if they avoided eating certain types of food and why. Both the Chinese and participants of other ethnicities mostly avoided eating foods high in sugar and fat. Table 4 shows the frequencies with which certain food types were avoided.

Table 4. Types of Foods Avoided.

	High sugar n(%)	**High fat n(%)**	**Carbohydrates n(%)**	**Protein n(%)**	**Other n(%)**
Chinese N=35	18(51.4)	20(57.1)	7(20.0)	4(11.4)	8(22.9)
Other N=61	34(55.7)	42(68.8)	9(14.7)	2(3.2)	15(24.6)

The reasons why these foods were avoided varied, but the most common reason for avoiding foods by both groups was fear of weight gain. 65.7% of the Chinese participants choose fear of weight gain as a reason for avoiding foods, while 62.3% of Other ethnicities choose fear of weight gain also. In contrast, 34.3% of Chinese females and 37.7% of Other females did not choose fear of weight gain as a reason for wanting to be thin. The second most common reason for avoiding foods for both

groups was for ‘Other reasons’ which included: trying to be healthy, not liking the food, and allergies. The Chinese participants and participants of Other ethnicities had different answers for the third most common reason for avoiding food. For the Chinese they stated they had no appetite as their third most common reason, whilst the other ethnicities had stomach bloating. Table 5 summarises the results of reasons for avoiding food.

Table 5. Reasons for Avoiding Certain Types of Food.

	Fear of food	**Stomach bloating**	**No hunger**	**Fear weight gain**	**Stomach pain**	**No appetite**	**Don’t know**	**Other**
	n(%)	**n(%)**	**n(%)**	**n(%)**	**n(%)**	**n(%)**	**n(%)**	**n(%)**
Chinese N=35	2(5.7)	2(5.7)	3(8.6)	23(65.7)	1(2.9)	6(17.1)	2(5.7)	10(28.6)
Other N=61	1(1.6)	7(11.5)	1(1.6)	38(62.3)	2(3.3)	1(1.6)	1(1.6)	27(44.3)

Participants were also asked whether they ever turned down food or did not complete a meal and the reasons for this. This was asked to see if a different question would result in similar reasons for not eating as described above. These results have been summarized in Table 6 below. The two most common reasons given by other ethnicities for not eating were that they were full or not hungry. In contrast, the two most common reasons the Chinese gave for not eating were not hungry and fear of weight gain. These findings are consistent for Chinese females with reasons for avoiding foods, because fear of weight gain was one of the most common reasons in both items.

Table 6. Reasons for Turning Down Food or Not Completing a Meal.

	Full	**Not hungry**	**Don't like**	**Fear weight gain**	**Limit certain foods**	**Sick**	**Stomach problems**	**Allergy**	**Other**
	n(%)	**n(%)**	**n(%)**	**n(%)**	**n(%)**	**n(%)**	**n(%)**	**n(%)**	**n(%)**
Chinese	4	7	3	6	2	3	4	0	2
N=26	(15.4)	(27.0)	(11.5)	(23.1)	(7.7)	(11.5)	(15.4)	(0.0)	(7.7)
Other	23	23	13	8	12	1	2	2	0
N=63	(36.5)	(36.5)	(20.6)	(12.7)	(19.0)	(1.6)	(3.2)	(3.2)	(0.0)

Participants were directly asked if they were afraid of becoming fat or gaining weight and rated this on a Likert scale. There were similar results for both groups on this item, as shown in Figure 1e) Over half the Chinese showed extreme fear of weight gain with 59.1% stating they 'frequently' or 'constantly' were afraid of becoming fat. Participants of Other ethnicities also showed extreme fear of weight gain with 47.9% asserting that they were 'frequently' or 'constantly' afraid of becoming fat. Both groups had very similar means with 2.50 for Chinese and 2.27 for other ethnicities, indicating that on average 'sometimes' participants were afraid of becoming fat.

Results of the data for Hypothesis Two indicate that both Chinese and Other participants have a fear of weight gain. Though, it is the Chinese students who were more likely to show a fear of weight gain than the Other female students.

Hypothesis Three: Pressure to be thin comes from different sources for Chinese compared to other ethnicities in New Zealand. Chinese are more likely to feel pressure from their family to be thin.

To investigate Hypothesis Three, participants were asked whether they wanted to be thin and their reasons for this. In addition, the ten-item Perceived Sociocultural

Pressure scale was used to view where pressure to be thin was coming from and the rating participants gave to each response. Finally, twelve items developed by me, based on the Eating Disorder Belief Questionnaire relating to if participants felt their body shape effected their family, were also analysed.

Participants who answered 'Yes' to the question of whether they wanted to be thin were asked their reasons for this, results of which have been summarized in Table 7 below.

Table 7. Reasons for Wanting to be Thin.

	N	**Myself n(%)**	**My Family n(%)**	**My Friends n(%)**	**My Partner n(%)**	**My Health n(%)**	**Other n(%)**
Chinese	44	35(80.0)	4(9.1)	3(6.8)	11(25.0)	19(43.2)	2(4.5)
Other	59	55(93.2)	5(8.5)	4(6.8)	20(33.9)	42(71.2)	5(8.5)

Table 7 indicates the most common reason for wanting to be thin was for themselves for both groups, with 80.0% of Chinese and 93.2% of Other ethnicities choosing this as a reason. The second most common reason for wanting to be thin was also the same for both groups, for their health. The two Chinese participants who choose 'other' reasons for wanting to be thin said that it was because clothes looked better if on them if they were thin. Reasons the five participants of Other ethnicities choose 'other' reasons for wanting to be thin were: for their sports, their job as a performer, and wanting to look more attractive.

Participants answered ten items for the Perceived Sociocultural Pressure Scale (PSPS) relating to pressure to be thin. The t-tests and effect sizes were calculated on

the PSPS total score and individually on the ten items, the results of which are summarized below in Table 8.

Table 8. The t-tests for Perceived Sociocultural Pressure Scale.

Measure	Chinese Mean(SD)	Other Mean(SD)	t-test (one-tailed)	Effect Size -Cohen's d
PSPS – Friend1	2.16(1.08)	1.70(1.00)	t(112)= -2.32 *	0.44
PSPS – Friend2	2.52(1.34)	2.01(1.00)	t(73)= -2.17 *	0.43
PSPS – Family1	2.00(1.22)	2.17(1.32)	t(112)= 0.70	0.13
PSPS – Family2	1.89(1.45)	2.10(1.24)	t(112)= 0.92	0.16
PSPS – Dated1	2.26(1.06)	2.09(1.26)	t(112)= -0.77	0.15
PSPS – Dated2	2.31(1.02)	2.13(1.23)	t(112)= -0.81	0.16
PSPS – Media1	2.50(1.39)	3.46(1.35)	t(112)= 3.65 *	0.70
PSPS – Media2	3.07(1.63)	4.09(1.20)	t(72)= 3.57 *	0.71
PSPS – Family3	1.77(1.18)	1.86(1.13)	t(112)= 0.38	0.08
PSPS – School1	1.52(0.79)	1.41(0.79)	t(112)= -0.77	0.14
PSPS – Total Score	22.00(8.26)	23.01(7.45)	t(112)= 0.67	0.13

*p<.05

Overall there was no significant difference in the total PSPS scores between the two groups. However, there are some significant differences between the two groups' responses to various items. There were significant differences between Chinese and Other ethnicities on items 1 and 2, which relate to feeling pressure from friends to lose weight and be thin, indicating that Chinese feel more pressure from their friends to be thin (effect sizes small to medium). Two other items which showed significant differences between the two groups were items 7 and 8 which related to feeling

pressure from the media to lose weight and be thin. In this case, the Other female students felt significantly more pressure from the media to be thin compared to the Chinese students (medium to large effect size).

Items 39 to 50 were based on the Eating Disorder Belief Questionnaire relating to how participants felt their body shape and weight affected their families. Analysis of these items was included in this section to help answer the hypothesis, of whether Chinese feel more pressure from their family to be thin. Referring back to Table 3. with the t-test results, this shows a significant difference between the two groups scores for the twelve EDBQ-based family related questionnaires. The average mean score for Chinese was 20.23, while for Other ethnicities the average mean score was only 9.12. There was a statistically significant difference between the two scores and a medium to large effect size of 0.71 (Cohen's *d*). This suggests that the Chinese students felt more family pressure to be thin. However, the mean scores for both groups were low, meaning there would not be a clinically significant effect of the role family plays in pressure to be thin.

Overall, results from this section were inconsistent depending on the measures used. According to Table 7. both Chinese and Other participants mostly wanted to be thin for themselves and for their health. Also, Chinese perceived themselves as having significantly more pressure from friends to be thin. While, Other ethnicities perceived themselves as having significantly more pressure from the media to be thin. There was no significant difference in the perceived pressure both groups felt from family to be thin on the Perceived Sociocultural Pressure Scale. However, Chinese had a significantly higher score for the family related EDBQ-based questions. This difference was between two low scores and was therefore not perceived to be clinically significant.

Hypothesis 4: Chinese that have been living in New Zealand longer will have similar levels of disordered eating and body dissatisfaction to those of other ethnicities living in New Zealand.

In order to test this hypothesis the Chinese group was split in two: those who had been in New Zealand less than 12 months, and those who had been in New Zealand longer than 12 months. Next, t-tests were conducted on all the necessary measures to see if any there were any significant differences. The measures which were used to test this hypothesis were similar to those used for Hypothesis One: BMI, ideal weight figure, how often participants weighed themselves, participants food intake compared with their peers, how afraid they were of gaining weight, the four SEED items relating to how participants perceived their bodies, Perceived Sociocultural Pressure Total Score, the two EDBQ subscales, twelve item EDBQ based scale, the two EAT total scores, and the three subscale scores for the EAT-26. Results of these t-tests have been summarized in Table 9 below.

There was only one significant difference for all the measures calculated and that was for whether they perceived their body thin or fat. This measure shows that the Chinese females who had been in New Zealand less than 12 months had a significantly higher score than those who had been here more than 12 months. Thus, Chinese living in New Zealand for a shorter length of time perceived their bodies worse than those living in New Zealand longer.

Thus, the length of time spent in New Zealand does not seem to have altered the levels of disordered eating and body dissatisfaction for Chinese females.

Table 9. The t-tests Results of Chinese Living in New Zealand for More or Less than 12 Months.

		Chinese in NZ less than 12 months		Chinese in NZ more than 12 months	
Measure	**N**	**Mean(SD)**	**N**	**Mean(SD)**	**t-test (two-tailed)**
BMI	25	21.63(3.52)	17	21.37(2.15)	t(40)= 0.271
Ideal Weight Figure	25	3.48(0.96)	18	3.44(1.34)	t(41)= 0.101
How Often Weigh Themselves	25	2.92(1.41)	18	3.50(1.89)	t(30)= -1.10
Eating Compared to Peers	24	4.58(1.21)	18	4.50(1.15)	t(40)= 0.23
Afraid of Gaining Weight	24	2.50(0.66)	18	2.50(0.79)	t(40)= 0.00
Perceive Body-Thin	22	0.45(0.74)	16	0.06(0.25)	t(27)= 2.31 *
Perceive Body-Attractive	23	0.35(0.83)	16	0.06(0.25)	t(27)= 1.55
Perceive Body-Muscular	22	0.68(1.17)	16	0.44(1.03)	t(36)= 0.67
Perceive Body-Feminine	22	0.41(0.85)	16	0.25(0.68)	t(36)= 0.62
PSPS Total Score	24	20.13(8.28)	18	24.00(7.84)	t(40)= -1.54
EDBQ- Accept by Others	25	32.47(17.65)	18	31.27(18.25)	t(41)= 0.21
EDBQ-Self-Accept	25	70.03(18.36)	18	62.78(16.28)	t(41)= 1.34
EDBQbased-Family	25	20.62(19.55)	18	19.22(19.43)	t(41)= 0.233
EAT-40 Total Score	24	18.52(9.34)	18	17.54(10.09)	t(40)= 0.33
EAT-26 Total Score	24	12.48(8.46)	18	11.54(8.34)	t(40)= 0.36
EAT-26 Dieting	24	8.17(6.47)	18	7.54(5.51)	t(40)= 0.33
EAT-26 Bulimia	25	1.92(2.33)	18	2.11(3.01)	t(41)= -0.24
EAT-26 Oral Control	25	2.26(2.40)	18	1.89(2.37)	t(41)= 0.50

*p<.05

Hypothesis 5: Using the EAT as a screening measure for eating disorders is not appropriate for use amongst Chinese populations.

In order to compare the results for each of the groups, item-total correlations for the EAT-40 were calculated.. Results of the item-total correlations are shown in Appendix E. Of the 40 items 16 items had significant positive correlations with the total score for both the Chinese females and the Other females, suggesting that these items were consistent across the two groups. Eleven of the 40 items had significant positive item-total correlations for the Other group, but not for the Chinese group. These items asked if participants: liked eating with other people, were aware of the calorie content of foods they eat, felt bloated after meals, vomit after eating, exercise strenuously to burn off calories, weighed themselves several times a day, eat the same foods day after day, thought about burning up calories when exercising, took laxatives, avoided foods with sugar in them, and gave too much time and thought to food.

Five of the 40 items had significant item-total correlations for the Chinese females, but not for the Other females. These were items about if participants: prepared foods for others but did not eat what they cooked, felt other would prefer if they ate more, woke up early in the morning, felt that food controls their life, and felt that others pressured them to eat.

Eight of the forty items did not significantly correlate with the total score for either group. These were items asking participants whether they: liked clothes to fit tightly, enjoyed eating meat, have regular menstrual periods, other people think participants are too thin, take longer than others to eat meals, enjoy eating at restaurants, display self-control around food, and enjoy trying new rich foods.

Four of the EAT-40 items negatively correlated with the total score for the Chinese female students, but were positively correlated for the Other female students. These were items: 1 ‘I like eating with other people’, 27 ‘Enjoy eating at restaurants’, 28 ‘Take laxatives’, and 39 ‘Enjoy trying new rich foods.’ The negative correlations signified that the items did not measure the same thing as the overall test for the Chinese students. One item, item 18 ‘Like my clothes to fit tightly’, was negatively correlated for the Other students, but not for the Chinese.

The item-total correlations for both groups indicate there are some items which did not correlate with overall test score for both the Chinese and Other females, although these items differ for the two groups. For the Chinese four of the items were not even positively correlated with the total score, while one item for the Others was negatively correlated. Therefore, the EAT-40 is not a good measure for Chinese females.

Although it was recognized that there were only a small number of participants, a principal components with oblique rotation factor analysis was carried out for the EAT-26 to see if the same items loaded on the three subscales of the EAT-26 for Chinese and Other ethnicities. The same type of factor analysis was carried out as in the original EAT-26 article (Garner et al., 1982).. For the dieting subscale items: 54, 59, 60, 64, 65, 72, 75, 79, 80, 86, 87, 88, and 89 are expected to load on the same factor. Items: 56, 57, 63, 81, 84, and 90 are supposed to load on the Bulimia and Food Preoccupation subscale. While, items: 55, 58, 62, 74, 76, 82, and 83 are expected to load on the Oral Control subscale. The Other female students had seven factors with eigenvalues over one, the first three factors all had eigenvalues greater than two. The Chinese females had nine factors with eigenvalues over one, four of those factors had

eigenvalues greater than two. Factor loadings of the items are presented in Table 10. below.

Table 10. Factor Analysis Data for the EAT-26.

Subscale		**Chinese**				**Other**		
	EAT Item (Q. item)	**F1**	**F2**	**F3**	**F4**	**F1**	**F2**	**F3**
Dieting	**4(54)**	.677				.771		
	9(59)			-.314		.704		
	10(60)	.420	.560			.525	-.333	
	14(64)	.751				.729		
	15(65)	.762				.765		
	22(72)	*	*	*	*	.683		.383
	25(75)	.874				.822		
	29(79)		.485				-.313	.439
	30(80)	.359	.568			.469		
	36(86)	.384	.565			.595		
	37(87)	.462		-.519		.757		.349
	38(88)	.537		-.460		.679	.445	
	39(89)		.433	-.544		*	*	*
Bulimia	**6(56)**	.551		.575		.653		
	7(57)	.652				.726		
	13(63)				.791	.622		-.599
	31(81)	.547	-.319	.341		.779		
	34(84)	*	*	*	*	.743		
	40(90)	.590	-.344		.317	.654	.477	-.324
Oral Control	**5(55)**	.461	.506			.625		-.580
	8(58)	.468		.429		.397		
	12(62)		.395	.374	-.321		.669	
	24(74)				-.391		.563	
	26(76)		.313	.350	-.426	*	*	*
	32(82)		.350	.359		*	*	*
	33(83)		.303		.660		.727	.376

Neither the Chinese nor the Other females had all items loading correctly on the three subscales according to the EAT-26. For the Chinese factor loadings some items did not load at all on the three factors, these were items: 22 ‘Think about burning up calories when I exercise’, and 34 ‘Give too much time and thought to food.’ The Other ethnicities group also had three items which did not load on the factors, items: 26 ‘Take longer than others to eat my meals’, 32 ‘Display self control around food’, and 39 ‘Enjoy trying new rich foods.’ For the Dieting subscale the Other female students had most items loading correctly on factor one, except for item 29 which loaded highest on factor three and item 39 which did not load on any of the three factors. The Chinese female students had only nine of the thirteen items for the Dieting subscale loading on factor one, but four of those items loaded higher on other factors. The items which loaded higher on other factors were: 10 ‘Particularly avoid foods with high carbohydrate content’, 30 ‘Eat diet foods’, 36 ‘Feel uncomfortable after eating sweets’, and 37 ‘Engage in dieting behaviour.’ The four items which did not load on factor one were items: 9, 22, 29, and 39. Item 9, asking participants if they are aware of the calorie content of foods they eat, negatively loaded on factor three. Item 22 as mentioned previously did not load on any of the four factors. Item 29 ‘Avoid foods with sugar in them’, loaded on factor two. While item 39 ‘Enjoy new rich foods’, loaded on factors two and three. For the remaining two subscales items did not load on the same factor as described in the original article for Other ethnicities. While, for Chinese females the Bulimia and Food Preoccupation subscale did not load on the same factor as in the original article. However, for the Oral Control subscale there were similar factor loadings across factors for Chinese females, so it could not be distinguished which item loaded on which factor.

Even though the factor analysis was conducted without sufficient participants, some interesting information was obtained. The Chinese group had four factors, while the Other group had three factors as was expected. Loadings on factor one closely resembled the Dieting subscale of the EAT-26 for both Chinese and Other female students. However, for the Chinese four of the items did not load on factor one and four of the items loaded higher on other factors, while two of the items did not load on factor one for the Others. None of the other factor loadings resembled the Bulimia and Food Preoccupation or Oral Control subscales of the EAT-26 for either group.

Therefore, the Eating Attitudes Test in either its long or short form is not an appropriate measure to use when looking at eating disorders amongst Chinese females.

Overall, results suggested that Chinese female students have greater levels of disordered eating and body dissatisfaction to Other female students. Fear of weight was more likely to be chosen as a reason for avoiding food or turning down a meal in Chinese females than Other females. Both groups felt the most pressure from themselves to be thin. Chinese perceived their friends as putting more pressure on them to be thin than Others. While, Others perceived the media as putting more pressure on them to be thin than Chinese. Length of time spent in New Zealand did not effect the levels of disordered eating and body dissatisfaction experienced by Chinese students. Finally, the EAT tests may not be appropriated for use amongst Chinese female students.

Discussion

The purpose of the present study was to examine the differences in disordered eating and body dissatisfaction between Chinese female students and female students of other ethnicities living in New Zealand. There were five main hypotheses for this study which concerned: levels of disordered eating and body dissatisfaction, fear of weight gain, where pressure to be thin came from, whether length of time in New Zealand altered Chinese students levels of disordered eating and body dissatisfaction, and the appropriateness of using the EAT as a diagnostic tool for Chinese females.

Initial pilot work revealed that both groups snacked on similar foods between main meals, had on average three main meals in a day, and felt they ate similar amounts to their peers and friends, thus alleviating this as a confound for the main study.

Hypothesis One: Chinese experience similar levels of disordered eating but less body dissatisfaction than do other ethnicities living in New Zealand.

It was expected that the Chinese females would have similar levels of disordered eating but less body dissatisfaction than the females of Other ethnicities. However, results of this study did not support the first hypothesis. The Chinese female students experienced greater levels of disordered eating and body dissatisfaction than female students of other ethnicities.

The Chinese students' scores were significantly different to the other female students' on all measures used to assess disordered eating and body dissatisfaction. The Chinese group had higher test scores for the EAT-40, EAT-26, and the EAT-26 Dieting subscale, indicating they had greater disordered eating than the other group. The Chinese also: choose a thinner ideal weight figure; weighed themselves more

often; had greater distortion of body perception with regards to how thin, attractive, muscular and feminine they viewed themselves; and scored higher on the Acceptance by Others and Self-Acceptance subscales of the EDBQ. The significantly higher scores on all these measures are evidence that the Chinese female students had greater levels of body dissatisfaction than the other female students.

These results are in contrast to the majority of previous literature, which found that Chinese had similar levels of disordered eating and lower levels of body dissatisfaction when compared with White people (Cummins et al., 2005; Lake et al., 2000; Sheffield et al., 2005; Wang et al., 2005; Yates et al., 2004). These studies were conducted in America or Australia and used similar aged university students as participants. Two of the studies as in this study, used the EAT-26 as a measure (Lake et al., 2000; Wang et.al., 2005). However, unlike this study where Chinese female students scored significantly higher than other female students, there were no significant differences between the scores of the Chinese and White participants (Lake et al., 2000; Wang et al., 2005). In Lake, Staiger and Glowinski's (2000) study Australian born participants obtained an average EAT-26 of 9.56, compared to a score of 8.60 for the Other ethnicities in this study. Also, the Traditional Hong Kong born participants had an average score of 11.90 for Lake, Staiger and Glowinski's (2000) study, while the Chinese students had a score of 12.19 on the EAT-26 for this study. Therefore the EAT-26 scores of this study and Lake, Staiger and Glowinski's (2000) study were not that different, but the difference between the ethnicities scores was significant for the current study. One key difference between the current study and previous literature was that this study compared Chinese females only with one group made up of many different ethnicities such as: New Zealand European, Maori, and

Pacific Islander. However, previous studies distinguished the different ethnic groups such as Caucasian, African-American, and Chinese.

The results of this study were also in contrast to previous literature which studied Chinese participants in China (Lee & Lee, 1996; Li et al., 2005; Luo et al., 2005). These studies found that Chinese women displayed similar disordered eating behaviours and body dissatisfaction attitudes to Western women (Lee & Lee, 1996; Li et al., 2005; Luo et al., 2005). School aged children or adults were the participants of these studies, so different populations than the current study were used. Only one of these studies used a measure which was also used in this study, the EAT-26 (Lee & Lee, 1996). The mean EAT-26 score was 8.42 for Lee and Lee's (1996) study. This was similar to the mean EAT-26 score of the other ethnicities group in this study which was 8.60. However, the Chinese participants in the current study had a higher mean EAT-26 of 12.19.

One previous study did have similar results to the current study, with Chinese participants having the greatest body dissatisfaction (Kennedy et al., 2004). Kennedy, Templeton, Gandhi and Gorzalka's (2004) study looked at three ethnic groups: European descent, Indo-Asian descent, and Chinese descent. The Chinese group were least satisfied with certain body parts and their physical condition, therefore had the greatest body dissatisfaction. The study was similar to the current study in that it was conducted in another Commonwealth country, Canada and used university students. However, different measures were used to assess body dissatisfaction.

With Chinese female students in this study showing greater levels of disordered eating and body dissatisfaction, this indicates that contrary to the literature Chinese rather than White females are more at risk for developing an eating disorder. However,

these results could be explained by where the Chinese participants came from, that is rural versus urban China.

Hypothesis Two: Chinese are less likely than other ethnicities in New Zealand to assign fear of weight gain as a reason for their disordered eating.

Reviewing the literature of eating disorders and Chinese, lead to the hypothesis that Chinese would be less likely than other ethnicities living in New Zealand, to assign fear of weight gain as a reason for their disordered eating. However, in contrast to the second hypothesis, the results of this study showed that Chinese females were actually more likely to show fear of weight gain than were females of Other ethnicities.

On all the measures relating to fear of weight gain, a greater number of the Chinese group showed fear of weight gain than did the Other group. The Chinese females weighed themselves more often than the other females. Both Chinese and other female students avoided similar foods, particularly foods high in fat or sugar. Also, both groups avoided these foods for primarily the same reason fear of weight gain, though a slightly higher percentage of Chinese than other students choose fear of weight gain as a reason for avoiding certain foods. When it came to reasons for turning down or not completing a meal the Other female students stated they did this because they either were full or not hungry. While, Chinese female students choose either not hungry or afraid of gaining weight as their main reasons for turning down or not completing a meal. Finally, over half of the Chinese participants had constant or frequent fear of weight gain. While, slightly less than half the other participants were also constantly or frequently afraid of gaining weight. Therefore, Chinese female

students exhibited fear of weight gain to a greater degree than did other female students.

Much of the previous literature indicated that Chinese patients with AN did not always exhibit fear of weight gain, an essential criteria for a diagnosis of AN (American Psychiatric Association, 2000; Lee, 1995; Lee & Lee, 2000; Lee, Ho & Hsu, 1993; Lee, Lee, Ngai, Lee & Wing, 2001; Miller & Pumariega, 2001; Rieger et al., 2001; Soh et al., 2006). Two of the studies asked a similar question to the current study, which was asking participants their reasons for food refusal (Lee, Ho & Hsu, 1993; Lee, Lee, Ngai, Lee & Wing, 2001). In response to the question on reasons for food refusal over half the Chinese patients in one study gave reasons other than fat phobia for their food refusal (Lee & Lee, 1993). Also, in Lee, Lee, Ngai, Lee and Wing's (2001) study, 16 of the 48 patients were regarded as non-fat phobic and assigned reasons other than fat phobia for their food refusal. While in contrast, in the current study 65.7% of the Chinese participants choose fear of weight gain as a reason for avoiding food. However, 35 % of the Chinese females did not give fear of weight gain as a reason for avoiding foods. The other studies had two groups those that did show fear of weight gain and those that did not, this study could also be grouped the same. The studies looking at reasons for food refusal used Chinese patients with AN, while the current study was only able to have Chinese female students as part of the study. Therefore, using patients with AN rather than just a community sample may have accounted for the high number of people who exhibited non-fat phobia. Also, the studies were conducted in China, while this study was carried out in New Zealand. The difference in location may also have accounted for the different results. One study which may help to understand the current studies results is one which studied three communities in China (Lee & Lee, 2000). The disordered eating habits of

female high school students from Hong Kong, Shenzhen, and rural Hunan were compared (Lee & Lee, 2000). Lee and Lee (2000) found that the female students living in urban areas were most likely to want to lose weight, while those living in rural areas were more likely to want to gain weight. Therefore, it could be that the current study had such a high percentage of Chinese female students exhibiting fear of weight gain, because they were from urban areas of China.

Hypothesis Three: Pressure to be thin comes from different sources for Chinese compared to other ethnicities in New Zealand. Chinese are more likely to feel pressure from their family to be thin.

For the third hypothesis it was expected that Chinese would be more likely to feel pressure from their families to be thin. However, results of the study did not support the hypothesis. Both the Chinese and Other female students showed similar results on pressure to be thin.

The most common reason both groups gave for wanting to be thin was for themselves followed by for their health. Also, the scores of both groups on the Perceived Sociocultural Pressure Scale were very similar, indicating Chinese and Other female students felt similar amounts of pressure to be thin. When looking at the answers for each item of the Perceived Sociocultural Pressure Scale, there was no difference in the scores relating to pressure from family to be thin. However, the Chinese group perceived significantly more pressure from their friends to lose weight. While, the other ethnicities group perceived significantly more pressure from the media to be thin. Examining the differences in the scores between the two groups scores for the questions relating to how family were affected by participants

appearance produced some interesting findings. The Chinese female students had a significantly higher score than the other female students. This showed that the Chinese group were more likely to feel their appearance affected how people would react to their family; that is for their family to have the approval of others they themselves had to look good. However, the mean score for the Chinese group was still relatively low at 20.23, with 100 being the highest mean score possible. Therefore, even though there was a significant difference in the two groups scores neither group greatly felt that family were affected by the individual's appearance.

Previous literature indicated that for Chinese family played a role in the pressure individuals felt to be thin (Haudek et al., 1999; Jennings et al., 2005; Lee & Lee, 1996; Ma, 2005). In two of the studies, greater parental protectiveness or less caring parents contributed to the Asian group having more disturbed eating and pressure to be thin (Haudek et al., 1999; Jennings et al., 2005).Another study, conducted in China found that, not just family cohesion but also family conflict played a significant role in the development of an eating disorder amongst Chinese adolescents (Lee & Lee, 1996). While, Ma (2005) in a case study of a Chinese adolescent with AN found that a good interpersonal relationship within the family was essential, while a mental illness meant social stigma. Therefore, Chinese with AN were expected to maintain a certain image to society due to pressure from family to look good (Ma, 2005).

Only one study of the previous literature used a similar group to the current study, university students (Haudek et al., 1999). All of the other studies looked at adolescent females, a younger age group. This suggests that Chinese adolescents feel pressure from their families to be thin, but as they get older pressure to be thin comes from different sources such as: themselves or their friends as in this study, this could be because the Chinese students are living away from their family now. Another

reason for this study's differing results could be the different measures used to assess pressure to be thin. None of the previous literature directly asked participants where they perceived the pressure to be thin from, or used the Perceived Sociocultural Pressure Scale. Instead, the Eating Disorder Inventory (EDI) was mainly used with particular attention paid to the Interpersonal Distrust, Maturity Fears and Drive for Thinness subscales. The EDI is a well-known and well-respected measure, but using it to assess pressure to be thin does not help to gain a broad idea of the concept. Asking participants directly where they feel pressure to be thin comes from, makes them think about exactly that. Also, the Perceived Sociocultural Pressure Scale, designed by Eric Stice (2006), gives an indication of how much pressure participants feel from different sources, and has often been used in eating disorder research but not with a Chinese sample. Therefore, the previous literature may have suggested that family plays an important role in pressure to be thin, but they used only one measure to assess this. The current study may actually present a clearer idea of Chinese and pressure to be thin, primarily because it was assessed using a number of different measures.

Hypothesis Four: Chinese that have been living in New Zealand longer will have similar levels of disordered eating and body dissatisfaction to those of other ethnicities living in New Zealand.

For the fourth hypothesis, it was expected that the Chinese female students who had been living in New Zealand longer, would have levels of disordered eating and body dissatisfaction similar to those of the Other female students. However contrary to the hypothesis, the more of time spent in New Zealand did not result in Chinese females having different levels of disordered eating and body dissatisfaction.

To test this hypothesis the Chinese group was split into two; those who had been living in New Zealand less than 12 months and those living in New Zealand more than 12 months. There were no significant differences in the scores between the two groups for any of the measures, except for one item, which may have been due to chance. Therefore, how long a Chinese participant had been living in New Zealand had no effect on their levels of disordered eating and body dissatisfaction. Thus, Chinese students who had been living in New Zealand longer did not have similar levels of disordered eating and body dissatisfaction to Other students in New Zealand, as there was no difference in the levels between the two Chinese groups.

Previous literature on Chinese, eating disorder symptomalogy and length of time spent in a Western country showed some mixed results. Two of the studies found that the longer Asian people lived in a Western country the closer the levels of eating disorder symptomalogy approached those of White people (Ball & Kenardy, 2002; Soh et al., 2006). Another study found that Chinese who had been living in Canada longer had lower levels of body dissatisfaction to Chinese who had just moved there (Kennedy et al., 2004). While, a meta-analytic review found no significant effect between ethnicity, acculturation and eating disorders (Wildes & Emery, 2001).

Surprisingly the results of the current study differed from Ball and Kenardy's (2002) study in Australia, even though a similar aged sample was used and Australia is a Western country which closely resembles New Zealand. However, Ball and Kenardy's (2002) sample size was much larger than the current study, which could have accounted for the differences.

Hypothesis Five: Using EAT as a screening measure for eating disorders is not appropriate for use amongst Chinese populations.

From this study it was expected, that using the EAT as a screening measure for eating disorders for Chinese female students would not be appropriate, because it is primarily a Western measure. Results of the study supported this hypothesis.

Item-total correlations and a factor analysis were conducted to test this hypothesis. Results of the item-total correlations indicated that for most of the EAT-40 items, both groups' scores measured the same thing as the overall test. However, for four of the EAT-40 items the Chinese group had a negative correlation, showing that these four items did not measure the same thing as the overall test. So, for the Chinese female students instead of every item positively correlating with the total score, four of the items did not. Meaning the Chinese group answered these questions differently than the Other ethnicities group.

Although there were not enough participants for a factor analysis, a factor analysis of the EAT-26 was performed. The factor analysis was to see if the same three factors emerged for both groups, as did when the EAT-26 was originally designed by Garner, Olmsted, Bohr and Garfinkel (1982). The same three factors did not emerge for either group. In fact four factors emerged for the Chinese female students. The first factor did closely resemble the Dieting subscale for the Other ethnicities group, as was expected. But, for the Chinese group eight of the thirteen items for the Dieting subscale either did not load on factor one. For the Other female students, factor one was the main factor, with only seven of the 26 items not loading on it. While, for Chinese females the items pertaining to the Bulimia and Oral Control subscales of the EAT-26, were actually a mix of four factors with having similar factor loadings across the four factors. Therefore, although there were not enough

participants for a factor analysis, results indicated that the Chinese group had different factors to the EAT-26 subscales. While, the Other ethnicities group did have three factors and one of them closely resembled one of the EAT-26 subscales. Thus, the Chinese female students were answering the questions differently to the Other female students.

Much of the previous research raised the question as to the appropriateness of using Western diagnostic tools for diagnosis of eating disorders with different ethnicities (Cummins et al., 2005; Lake et al., 2000; Miller & Pumariega, 2001; Wildes & Emery, 2001). Research performed in China gave evidence as to the inappropriateness of Western measures, because they did account for the two distinct groups of Chinese patients with AN, fat phobics and non-fat phobics (Lee, 1995; Lee, Ho & Hsu, 1993; Lee, Kwok, Liau & Leung, 2002; Lee, Lee, Ngai, Lee & Wing, 2001). However, these two distinct groups were not found in this study and Chinese exhibited more fear of weight gain than other ethnicities, so this cannot be a reason why the EAT-26 was inappropriate for the Chinese female students. However, two Chinese studies were found which also used the EAT and found it screened out some of the patients who actually had AN (Lee, 1995; Lee, Kwok, Liau & Leung, 2002). In Lee's (1995) case study, a female patient who had no physical cause for her weight loss and fit most of the criteria for an eating disorder, only scored 23 on the EAT-40 which is below the cut-off of 30. Also, in Lee, Kwok, Liau and Leung's (2002) study of patients with AN nearly half of the patients actually scored below the cut-off score on the EAT-26. Therefore, in both of these studies Chinese patients with AN would not have been diagnosed with an eating disorder using the EAT a Western measure. These studies only used the cut-off scores as proof that the EAT was an inappropriate measure for use with Chinese populations. The results of the current study further

support the idea that the EAT is inappropriate for use amongst Chinese female students. Plus, there were four factors found for the EAT-26 for the Chinese group, none of which resembled the factor structure of the original three factors found for the EAT-26. It must be noted that 31 of the 45 Chinese filled in a Chinese version of the questionnaire, which even though was translated to match the English version as much as possible, could have effected how respondents answered questions. A shortened version of the EAT could be used for Chinese females based on these results. Four of the original EAT-26 items should not be included in the shortened version, because they either do not load on any of the factors, or only loaded on factor four. These are items: 13 'Vomit are I have eaten', 22 'Think about burning up calories when I exercise', 24 'Other people think I am too thin', and 34 'Give too much time and thought to food'.

Results of this study support previous literature that the EAT is not an appropriate diagnostic tool for use amongst Chinese. The Chinese group responded to the EAT differently and had a different factor structure for the EAT-26 than the other group.

Implications

This study suggest that Chinese females studying in New Zealand may actually have greater disordered eating and body dissatisfaction than Other ethnicities. Therefore, Chinese may be more at risk of developing an eating disorder than was previously thought. The small body size of Chinese women (Leung, Lam & Sze, 2001), and years of research on the problems Western women experience with disordered eating and body dissatisfaction, may have lead to the assumption that Chinese women did not experience disordered eating and body dissatisfaction to the

same degree as Western women. However, the present study has shown this is just not true and that this is a topic that requires further research.

The present study also has implications as to using Western measures to diagnose eating disorders amongst Chinese. This study suggests that the EAT, a widely known and used diagnostic tool, may actually not be appropriate for use amongst Chinese females when studying eating disorders. If Western diagnostic tools are not appropriate for use amongst Chinese populations, then it may be that the prevalence rate of eating disorders amongst Chinese is actually higher than is currently thought. Therefore, diagnostic tools need to be developed which can accurately diagnose eating disorders amongst Chinese.

Limitations of the Present Study

In interpreting and applying the findings of this study there are some things that need to be taken into consideration. The sample size was relatively small and was composed of female university students only. Therefore, the results may not truly reflect disordered eating and body dissatisfaction amongst the wider New Zealand community, so may be of little value in trying to comprehend disordered eating and body dissatisfaction in a New Zealand setting.

Also, Chinese were compared with one group made up of a number of different ethnicities. This was because except for New Zealand European there were relatively few participants of other ethnicities. However, the other ethnicities group portrayed the different ethnicities which live in New Zealand so were all considered under one heading. Not separating and comparing the different ethnicities may mean that results do not accurately represent disordered eating and body dissatisfaction amongst ethnicities living in New Zealand.

The fact that this study relied exclusively on self-report measures also limits the findings, as participants may have under or over reported. Ideally, the questionnaire should have been followed up with interviews, but to maintain anonymity and due to time constraints a self-report measure was used.

Future Research

This study has shown that Chinese may actually experience greater disordered eating and body dissatisfaction than other ethnicities, contrary to previous research (Ball & Kenardy, 2002; Lake et al., 2000; Sheffield et al., 2005; Wang et al., 2005; Yates et al., 2004). Given that research on Chinese and eating disorders has produced differing results this is still an area which needs a lot of study. A large scale comprehensive study of disordered eating and body dissatisfaction for Chinese living in different Western countries such as America, Australia and New Zealand compared with Chinese living in China, would give a more concise picture as to the similarities or differences of disordered eating and body dissatisfaction for the different Chinese groups. Also, in order to better understand the role of disordered eating and body dissatisfaction in a New Zealand setting, a larger community sample more representative of the country as a whole needs to be studied. It may be that using a sample of primarily university students has either exaggerated or hidden the symptoms of eating disorders. Hence, a study in New Zealand on disordered eating and body dissatisfaction which considers different age groups and different ethnic groups will give a clearer description of just how important these issues are.

Previous literature indicated that fear of weight gain was not a prominent issue with Chinese (Lee, 1995; Lee, Ho & Hsu, 1993; Lee, Lee, Ngai, Lee & Wing, 2001). However, the current study showed that Chinese female students experienced more

fear of weight gain than other female students. Therefore, future research should compare Chinese living overseas with Chinese living in China to discover if fear of weight gain is present for both groups or whether only Chinese living overseas fear of weight gain.

Finally, the current study as in previous studies raised the issue as to the appropriateness of Western diagnostic tools when studying Chinese and eating disorders (Cummins et al., 2005; Lake et al., 2000; Lee, 1995; Lee, Lee, Ngai, Lee & Wing, 2001; Wildes & Emery, 2001). Therefore, use of Western measures for diagnosing Chinese with eating disorders needs further research. A study should be conducted which looks at the main measures used to diagnose eating disorders such as the EAT and the EDI. The study should have a sufficient number of participants so that a factor analysis can be carried out, plus both Chinese and White participants should be used so that results can be compared. For a clearer idea of the appropriateness of these measures studies should be carried out in different countries where White and Chinese participants can be found, countries such as America, Australia, New Zealand and China.

Conclusions

The first hypothesis was not supported by the results. In fact the Chinese female students' in this study had greater levels of disordered eating and body dissatisfaction, than the other female students'. Most of the previous literature had similar aged participants, were conducted in Western countries as in this study, and sometimes used the same measures as this study. The different results could be attributed to the fact that Chinese were compared with a group made up of different ethnicities in this

study, so the results are not the same as when Chinese are compared with White participants.

Results of the current study imply that Chinese female students in New Zealand exhibit fear of weight to a greater degree than other female students in New Zealand. These results were in contrast to much of the previous literature found on fear of weight gain amongst Chinese. Reasons for the contrasting results of this study may be due to, the study being conducted on a community sample of Chinese students living in New Zealand, rather than a clinical sample of Chinese patients living in China.

The current study also showed that Chinese female students feel just as much pressure to be thin as other female students. Plus, that pressure to be thin comes from primarily the same source for the two groups, themselves. However, Chinese female students felt more pressure from their friends, and other female students felt more pressure from the media to be thin. Pressure from family was not a major reason for wanting to be thin for either group. These results differed from previous literature, but this could be due to the different age groups studied, or the differing measures used.

Contrary to Hypothesis Four length of time Chinese lived in New Zealand, did not affect their levels of disordered eating and body dissatisfaction. Other studies which found acculturation effects used large sample sizes which could have affected the results. It can be concluded from the current study, that length of time Chinese female students live in New Zealand will have no effect on their disordered eating and body dissatisfaction.

Finally, this study suggests that the EAT is not an appropriate measure to use on Chinese females when assessing eating disorders. Maybe a shorter version of the EAT-26 could be used on Chinese populations, but more research is needed in this area.

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Appendix A: Question Sheet for Focus Groups

Questions for Focus Groups

- In China/ or in New Zealand (whichever applies to which focus group) how many meals did you usually eat in a day?

- Would this be typical of people in China/ or in New Zealand?

- What sort of food did you usually eat for these meals?

  Breakfast

  Lunch

  Dinner

- Is this sort of food typical of people in China/ or in New Zealand?

- Did you usually have snacks between meals? If so, what sort of food did you usually eat for these snacks?

- Would you say it was typical of people in China/ or in New Zealand to snack between meals? Is this sort of food typical of people in China/ or in New Zealand?

I will also take rice, paper plates and scales and get those in the focus groups to measure out how much they would have for a typical main meal, and then weigh it.

Appendix B: English Version of Questionnaire

Eating Patterns in Different Cultures

This is a study on the eating patterns of different cultures, specifically Chinese and New Zealand women. I am interested in your responses to the following questionnaire to help study this topic, and really appreciate your participation.

The questionnaire is designed to be completely anonymous, so please do not include your name in the form. If you are a PSYC102 or PSYC103 student, the 1% course credit form can be detached from the back of this questionnaire and placed in the course credit form slot of the box for completed questionnaires and course credit forms located in the Psychology office.

If you wish to receive a summary of the results of this study, please write your email address on the blank page at the back, detach this page and put in the box along with your completed questionnaire. Results will be sent to you by email.

It is assumed that your consent will be given by the return of the questionnaire, but if for any reason you no longer wish to participate please do not feel pressured to return the questionnaire. You have the right to withdraw from the study at any time.

Thank you very much for your time and participation

Sherida Jenkins

What is your age?

Which Ethnicity do you primarily identify with? (Please tick one)

- o New Zealand European
- o New Zealand Maori
- o Pacific Islander
- o Chinese
- o Korean
- o Japanese
- o Other

Were you born in New Zealand? If not how long have you been staying in New Zealand?

What is your current height? (in centimetres)

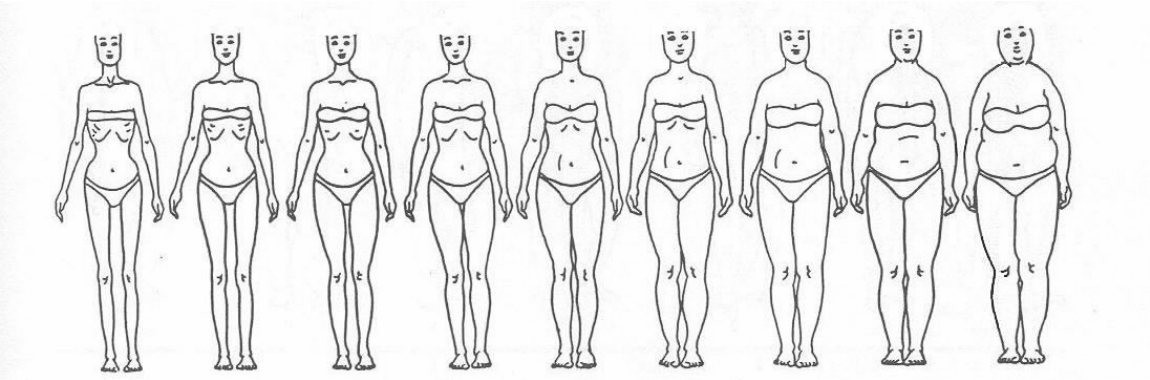
What is your current weight? (in kilograms)

What has been your lowest weight in the past 3 years? (in kilograms)

What has been your highest weight in the past 3 years? (in kilograms)

The following questions ask you a bit about your eating habits and the way you feel about your body. Please answer according to what *really reflects* your eating habits and feelings, rather than what you think your eating habits and feelings should be.

1. Which of the following figures best represents your ideal weight? (Please circle one)



2. How often do you weigh yourself? (Please circle one)

Almost never	1
A few times per year	2
1-3 times per month	3
Once a week	4
More than twice a week	5
Once a day	6
More than once a day	7

3. How many main meals do you eat in a day (e.g. breakfast, lunch, dinner)?

_____

4. Do you consider yourself as eating more or less than your peers/friends of the same sex and similar age? (Please mark off on scale; 1 = I eat a lot less than my friends, 7 = I eat a lot more than my friends)

1 2 3 4 5 6 7

5. Do you snack on food between main meals?

_____

6. What type of food do you snack on? (Please tick as many as applicable)
   - o Fruit (e.g. banana)
   - o Dairy Products (e.g. yoghurt)
   - o Sandwich
   - o Biscuits or Crackers (e.g. rice crackers)
   - o Chips (e.g. Twisties)
   - o Sweets or Lollies (e.g. chocolate)
   - o Nuts or Seeds (e.g. peanuts)
   - o Hot Food (e.g. pie or hot chips)
   - o 2-minute Noodles
   - o Sushi

7. Do you often avoid eating certain types of food? If yes, then what types of food do you avoid?
   - o Food high in sugar (e.g. lollies)
   - o Food high in fat (e.g. pies)
   - o Carbohydrates (e.g. potatoes, rice)
   - o Protein (e.g. meat)
   - o Other (please list)

_____

_____

8. What are your reasons for avoiding these foods?
   - o fear of food
   - o stomach bloating
   - o no hunger
   - o fear of weight gain
   - o stomach pain
   - o no appetite
   - o don't know
   - o other reasons (please specify)

_____

_____

9. Are you afraid of becoming fat or gaining weight?

Not at all	1
Rarely	2
Sometimes	3
Frequently	4
Constantly	5

10. In what way do you perceive you body? (Please cross in the appropriate box where you see yourself)

Much too thin	1	2	3	4	5	Much too fat
Attractive	1	2	3	4	5	Unattractive
Muscular	1	2	3	4	5	Flabby
Feminine	1	2	3	4	5	Lacking feminity

11. Do you ever turn down food or not complete a meal? If yes, why?

_____

_____

12. Do you want to be thin? What are your reasons for wanting to be thin? (Please tick as many as apply)
   - o For myself
   - o For my family
   - o For my friends
   - o For my partner
   - o For my health
   - o Other (please specify)

_____

_____

The next section of questions is asking you about feeling pressure to be thin. There is a 1-5 scale, with 1 = none, 3 = some and 5 = a lot. Using the scale please circle the response that best captures your own experience.

None		**Some**		**A lot**
1	**2**	**3**	**4**	**5**

13. I've felt pressure from my friends to lose weight

1 2 3 4 5

14. I've noticed a strong message from my friends to have a thin body

1 2 3 4 5

15. I've felt pressure from my family to lose weight

1 2 3 4 5

16. I've noticed a strong message from my family to have a thin body

1 2 3 4 5

17. I've felt pressure from people I've dated to lose weight

1 2 3 4 5

18. I've noticed a strong message from people I've dated to have a thin body

1 2 3 4 5

19. I've felt pressure from the media (e.g. TV, magazines) to lose weight

1 2 3 4 5

20. I've noticed a strong message from the media to have a thin body

1 2 3 4 5

21. Family members tease me about my weight or body shape

1 2 3 4 5

22. Kids at school tease me about my weight or body shape

1 2 3 4 5

Please rate each of the following statements using the scale provided. Mark off on the 0-100 scale where you feel best describes your own opinion of each of the statements.

Example

0 _____|_____ **50** _____ **100**

0 = I do not usually believe this at all
100 = I am usually completely convinced that this is true

23. If my thighs are firm it means I'm a better person

0 _____ 50 _____ 100

24. If my hips are narrow it means I'm successful

0 _____ 50 _____ 100

25. If my bottom is small people will take me seriously

0 _____ 50 _____ 100

26. If I gain weight it means I'm a bad person

0 _____ 50 _____ 100

27. If I gain weight I'm nothing

0 _____ 50 _____ 100

28. If my body shape is in proportion people will love me

0 _____ 50 _____ 100

29. If my hips are thin people will approve of me

0 _____ 50 _____ 100

30. If I lose weight people will be friendly and want to get to know me

0 _____ 50 _____ 100

Don't believe **Convinced it's true**
0 _____ 50 _____ 100

31. If I lose weight people will care about me

0 _____ 50 _____ 100

32. If I lose weight I'll count more in the world

0 _____ 50 _____ 100

33. If my stomach is flat I'll be more desirable

0 _____ 50 _____ 100

34. If my flesh is firm I'm more attractive

0 _____ 50 _____ 100

35. If my body is lean I can feel good about myself

0 _____ 50 _____ 100

36. If I eat desserts or puddings I'll get fat

0 _____ 50 _____ 100

37. Body fat/flabbiness is disgusting

0 _____ 50 _____ 100

38. If I eat bad foods such as fats, sweets, bread and cereals they will turn into fat

0 _____ 50 _____ 100

39. If my thighs are firm it means my family will be viewed by others as better people

0 _____ 50 _____ 100

Don't believe **Convinced it's true**
0 _____ 50 _____ 100

40. If my hips are narrow it means my family will be viewed by others as successful

0 _____ 50 _____ 100

41. If my bottom is small people will take my family seriously

0 _____ 50 _____ 100

42. If I gain weight it means my family are bad people

0 _____ 50 _____ 100

43. If I gain weight my family will lose status

0 _____ 50 _____ 100

44. If my body shape is in proportion people will love my family

0 _____ 50 _____ 100

45. If my hips are thin people will approve of my family

0 _____ 50 _____ 100

46. If I lose weight people will be friendly and want to get to know my family

0 _____ 50 _____ 100

47. If I lose weight people will care about my family

0 _____ 50 _____ 100

48. If I lose weight my family will count more in the world

0 _____ 50 _____ 100

Don't Believe **Convinced it's true**
0 _____ 50 _____ 100

49. If my body is lean my family can feel good about themselves

0 _____ 50 _____ 100

50. My family/friends think body fat/flabbiness is disgusting.

0 _____ 50 _____ 100

Please circle the appropriate number which applies best to each of the numbered statements below. Most of the questions directly relate to food or eating, although other types of questions have been included. Please answer each question carefully using the following key for your answers.

1 = Never
2 = Rarely
3 = Sometimes
4 = Often
5 = Very Often
6 = Always

51. I like eating with other people

1 2 3 4 5 6

52. Prepare foods for others but do not eat what I cook

1 2 3 4 5 6

53. Become anxious prior to eating

1 2 3 4 5 6

54. Am terrified about being overweight

1 2 3 4 5 6

55. Avoid eating when I am hungry

1 2 3 4 5 6

Never **Always**
1 2 3 4 5 6

56. Find myself preoccupied with food

1 2 3 4 5 6

57. Have gone on eating binges where I feel that I may not be able to stop

1 2 3 4 5 6

58. Cut my food into small pieces

1 2 3 4 5 6

59. Aware of the calorie content of foods that I eat

1 2 3 4 5 6

60. Particularly avoid foods with high carbohydrate content (e.g. bread, potatoes, rice, etc.)

1 2 3 4 5 6

61. Feel bloated after meals

1 2 3 4 5 6

62. Feel that others would prefer if I ate more

1 2 3 4 5 6

63. Vomit after I have eaten

1 2 3 4 5 6

64. Feel extremely guilty after eating

1 2 3 4 5 6

Never					**Always**
1	**2**	**3**	**4**	**5**	**6**

65. Am preoccupied with a desire to be thinner

1	2	3	4	5	6

66. Exercise strenuously to burn off calories

1	2	3	4	5	6

67. Weigh myself several times a day

1	2	3	4	5	6

68. Like my clothes to fit tightly

1	2	3	4	5	6

69. Enjoy eating meat

1	2	3	4	5	6

70. Wake up early in the morning

1	2	3	4	5	6

71. Eat the same foods day after day

1	2	3	4	5	6

72. Think about burning up calories when I exercise

1	2	3	4	5	6

73. Have regular menstrual periods

1	2	3	4	5	6

Never					**Always**
1	**2**	**3**	**4**	**5**	**6**

74. Other people think that I am too thin

1	2	3	4	5	6

75. Am preoccupied with the thought of having fat on my body

1	2	3	4	5	6

76. Take longer than others to eat my meals

1	2	3	4	5	6

77. Enjoy eating at restaurants

1	2	3	4	5	6

78. Take laxatives

1	2	3	4	5	6

79. Avoid foods with sugar in them

1	2	3	4	5	6

80. Eat diet foods

1	2	3	4	5	6

81. Feel that food controls my life

1	2	3	4	5	6

82. Display self control around food

1	2	3	4	5	6

Never					**Always**
1	**2**	**3**	**4**	**5**	**6**

83. Feel that others pressure me to eat

1	2	3	4	5	6

84. Give too much time and thought to food

1	2	3	4	5	6

85. Suffer from constipation

1	2	3	4	5	6

86. Feel uncomfortable after eating sweets

1	2	3	4	5	6

87. Engage in dieting behaviour

1	2	3	4	5	6

88. Like my stomach to be empty

1	2	3	4	5	6

89. Enjoy trying new rich foods

1	2	3	4	5	6

90. Have the impulse to vomit after meals

1	2	3	4	5	6

If anything in this questionnaire has caused any uncomfortable feelings or triggered any unpleasant memories for you, then it may help to talk to a professional about it. At the Student Health Centre, located on campus, there is a Student Counselling Service. The Student Counselling Service is available to all students at the University of Waikato; appointments can be made by phoning (07) 838 4201.

If you have any concerns about this study that you wish to discuss with me, please feel free to contact me. My email is slj2@waikato.ac.nz or you can phone me on 021 207 4509.

Thank you again for your time and cooperation.

Sherida

Appendix C: Chinese Version of Questionnaire

不同文化的饮食规律

该调查针对不同文化的饮食规律，尤其针对中国女性和新西兰女性。我对你的答案十分感兴趣，希望它们能帮助调查主题，并对你的参予不胜感激。

这份问卷是份不记名问卷，所以请不要在问卷上写你的名字。

如果你希望知道调查结果反馈，请在问卷后的空白纸上留下你的邮箱地址。请在将问卷放回盒子之前，把留有邮箱的一页和问卷拆开。调查结果会随后发送到你的邮箱。

就我们而言，如果你送还你的问卷，证明你同意参予该调查。在任何阶段，如果你不想再参予该次调查，你有权抽回问卷。请自愿参予该调查，不要觉得有压力。

十分感激你的参予和你宝贵的时间。

Sherida Jenkins

你几岁了？

_____

你的民族/籍贯是什么？

- 新西兰欧裔
- 新西兰毛利
- 太平洋岛
- 中国
- 韩国
- 日本
- 其他

你在新西兰出生的吗？如果不是，你住在新西兰多久了？

_____

你目前的身高是多少？（厘米）

_____

你目前的体重是多少？（公斤）

_____

你过去三年的最低体重是多少？（公斤）

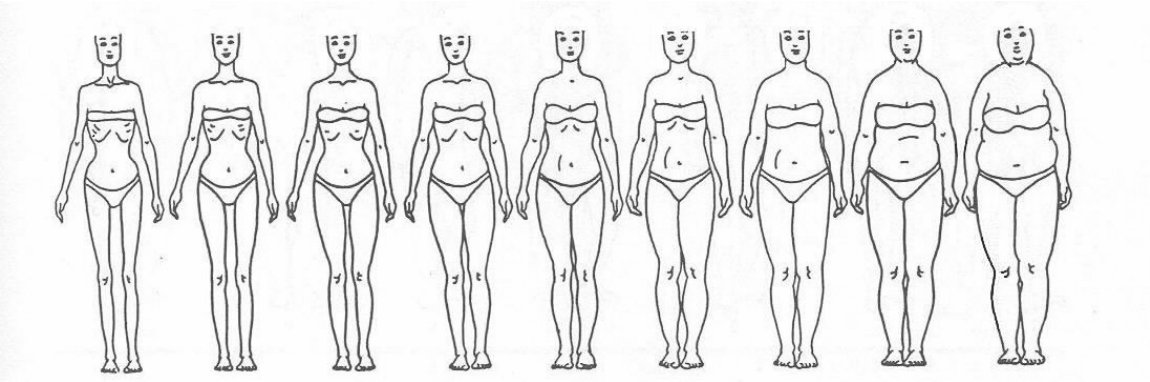
_____

你过去三年的最高体重是多少？（公斤）

_____

下列问题是关于你的饮食习惯和你对自己体形的认知。请以你的真实习惯和认知来回答，不要以你认为正确的习惯和认知来回答。

1. 请从下列图形中选出你最理想体重。（请划圈）



2. 你多久称一次体重？（请划圈）

极少	1
每年几次	2
每月一到三次	3
每周一次	4
每周两次以上	5
每天一次	6
每天一次以上	7

3. 每天你吃多少顿主餐？（e.g. 早餐，午餐，晚餐）

_____

4. 你认为在和你年龄相似并且同性同学/朋友中，你的食物摄取量是多还是少（请从 1 到 7 中做出选择，1= 我比我朋友远远吃得少，7= 我比我朋友远远吃得多）

1 2 3 4 5 6 7

5. 你在主餐之间吃零食吗？

_____

6. 你吃什么样的零食？（请在所有适合你的选项旁打钩）
   - o 水果（e.g. 香蕉等）
   - o 奶制品（e.g. 酸奶等）
   - o 三明治
   - o 饼干
   - o 薯片（e.g. 品客士）
   - o 甜食或唐国（e.g. 巧克力）
   - o 坚果类（e.g. 华升）
   - o 热的食物（e.g. 面条或米粉）
   - o 方便面
   - o 寿司

7. 你有常常避免不吃的食物吗？如果有，是哪种食物？
   - o 高糖食物（e.g. 甜果等）
   - o 告脂食物（e.g. 派等）
   - o 店分类（e.g. 土豆，米饭等）
   - o 蛋白质（e.g. 肉类 等）
   - o 其他（请列出具体食物）

_____

_____

8. 你避免这些食物的原因是什么？
   - o 对食物的恐怕
   - o 胃胀/腹胀
   - o 不饿
   - o 怕增加体重
   - o 胃痛/腹痛
   - o 没食欲
   - o 不知道
   - o 其他原因（请给出具体院银）

_____

_____

9. 你害怕长胖或增加体重吗？

一点也不	1
很少	2
有时	3
常常	4
一直在担心	5

10. 你怎么看待自己的体形？（请选出适合你的并，划圈）

非常瘦	1	2	3	4	5	非常胖
很吸引人	1	2	3	4	5	不吸引人
很肌肉发达	1	2	3	4	5	不肌肉发达
很有女性感	1	2	3	4	5	缺乏女性感

11. 你曾经有过不吃东西或不下东西的经历吗？如果有，为什么？

_____

12. 你想要自己瘦吗？你想要瘦的原因是什么？（请在所有适合你的项旁打钩）
    - o 因为自己
    - o 因为我家人
    - o 因为我朋友
    - o 因为我男朋友
    - o 因为我的身体健康
    - o 其他（请给出具体原因）

_____

_____

下个部分的问题是有关你的减肥压力的。衡量表范围从 1 到 5，1= 没有压力，3= 有一些压力和 5= 很大的压力。在这个衡量表中，请在最适合你经历的一项上划圈。

没有压力		有一些压力		很大的压力
1	**2**	**3**	**4**	**5**

13. 我想减肥，因为我的朋友给我压力
    1 2 3 4 5

14. 我知道对于我的朋友而言，拥有苗条的体形很重要
    1 2 3 4 5

15. 我想减肥， 因为我的家人给我压力
    1 2 3 4 5

16. 我知道对于我的家人而言，拥有苗条的体形很重要
    1 2 3 4 5

17. 我想减肥，因为我约会的对象给我压力。
    1 2 3 4 5

18. 我知道对于我约过会的人而言，拥有苗条的体形很重要。
    1 2 3 4 5

19. 我想减肥， 因为媒体（e.g. 电视，杂志等）给我压力。
    1 2 3 4 5

20. 我知道对于媒体而言，拥有苗条的体形很重要。
    1 2 3 4 5

21. 其他家庭成员把我的体形和体重当玩笑。

1 2 3 4 5

22. 学校里的同学把我的体形和体重当玩笑。

1 2 3 4 5

请使用提供的衡量表给下列陈述打分。从 0 刀 100 中，为每个陈述打出你最想表达自己意见的分数。

例子

0 ——————|—— **50** —————————— **100**

0= 通常我一点也不相信这是真的
100= 通常我完全相信这是真的

23. 如果我的大腿结实，我就会变得更优秀

0 _____ 50 _____ 100

24. 如果我的髋部窄， 我就会成功

0 _____ 50 _____ 100

25. 如果我的屁股小，别人就会认真对的我

0 _____ 50 _____ 100

26. 如果我体重增加，我就会使人讨厌

0 _____ 50 _____ 100

27. 如果我体重增加，我就会一无是处

0 _____ 50 _____ 100

28. 如果我的体形成比例，别人就会喜欢我

0 _____ 50 _____ 100

一点也不相信 完全相信

0 _____ 50 _____ 100

29. 如果我的髋部窄， 别人就会认可我

0 _____ 50 _____ 100

30. 如果我变瘦，别人不但会对我很友好，还会想结识我

0 _____ 50 _____ 100

31. 如果我变瘦，别人就会关心我

0 _____ 50 _____ 100

32. 如果我变瘦，在这个世界上我就会更有价值

0 _____ 50 _____ 100

33. 如果我腹部平坦，我就会更性感

0 _____ 50 _____ 100

34. 如果我的肉体结实，我就会更吸引人

0 _____ 50 _____ 100

35. 如果我的体形苗条，我自我感觉会很好

0 _____ 50 _____ 100

36. 如果我吃甜点或布丁，我就会长胖

0 _____ 50 _____ 100

37. 脂肪和赘肉很恶心

0 _____ 50 _____ 100

一点也不相信 **完全相信**

0 _____ **50** _____ **100**

38. 如果我吃不健康的食物，比女脂肪，甜食，面包和麦片，这些食物变成身体脂肪

0 _____ 50 _____ 100

39. 如果我的大腿结实，在别人眼中，我的家人就会更优秀

0 _____ 50 _____ 100

40. 如果我的髋部窄，在别人眼中，我的家人就是成功的

0 _____ 50 _____ 100

41. 如果我的屁股小，别人就会认真对得我的家人

0 _____ 50 _____ 100

42. 如果我体重增加，我的家人就会使人讨厌

0 _____ 50 _____ 100

43. 如果我体重增加，我的家人就会失去现有的社会地位

0 _____ 50 _____ 100

44. 如果我的体形成比例，别人就会喜欢我的家人

0 _____ 50 _____ 100

45. 如果我的髋部窄，别人就会认可我的家人

0 _____ 50 _____ 100

一点也不相信 完全相信

0 _____ 50 _____ 100

46. 如果我变瘦，别人不但会对我的家人很友好，还会想结认我的家人

0 _____ 50 _____ 100

47. 如果我变瘦，别人就会关心我的家人

0 _____ 50 _____ 100

48. 如果我变瘦，在这个世界上，我的家人就会更有价值

0 _____ 50 _____ 100

49. 如果我的体形苗条，我家人的自我感觉会很好

0 _____ 50 _____ 100

50. 我的家人和我的朋友认为脂肪和赘肉很恶心

0 _____ 50 _____ 100

请从下列编号的陈述中圈出最适合你的数字。虽然大多数的问题直接与食物或饮食有关，少量问题也包括其它内容。请用下列代码仔细回答每个问题。

1 = 从来不
2 = 很少
3 = 有时
4 = 常常
5 = 很频繁
6 = 总是

51. 我喜欢和别人一起吃饭

1 2 3 4 5 6

52. 我煮东西给别人吃，但是我不吃自己煮的东西

1 2 3 4 5 6

53. 吃饭前会紧张不安

1 2 3 4 5 6

54. 我非常害怕体重超重

1 2 3 4 5 6

55. 我饿的时候，也极力避免吃东西

1 2 3 4 5 6

56. 食物占满了我的脑海

1 2 3 4 5 6

57. 我有过暴饮暴食的经历，觉得自己无法停止

1 2 3 4 5 6

从来不					总是
1	**2**	**3**	**4**	**5**	**6**

58. 把我的食物切得很小

1 2 3 4 5 6

59. 清楚我所吃东西的卡路里含量

1 2 3 4 5 6

60. 尤其回避淀粉含量高的食物（e.g. 面包，土豆，米饭等）

1 2 3 4 5 6

61. 吃完饭后，觉得气胀

1 2 3 4 5 6

62. 觉得别人宁可我多吃一些

1 2 3 4 5 6

63. 我吃完饭以后，就呕吐

1 2 3 4 5 6

64. 吃完饭以后，会有负罪感

1 2 3 4 5 6

65. 想要瘦的愿望占满了我的脑海

1 2 3 4 5 6

从来不					总是
1	**2**	**3**	**4**	**5**	**6**

66. 努力运动来燃烧卡路里

1 2 3 4 5 6

67. 我一天之内称号几次体重

1 2 3 4 5 6

68. 喜欢我的衣服紧身

1 2 3 4 5 6

69. 喜欢吃肉

1 2 3 4 5 6

70. 早上醒得很早

1 2 3 4 5 6

71. 一天又一天吃同样的食物

1 2 3 4 5 6

72. 一边运动一边想着燃烧卡路里

1 2 3 4 5 6

73. 月经期很正常

1 2 3 4 5 6

从来不					总是
1	**2**	**3**	**4**	**5**	**6**

74. 别人认为我太瘦

1 2 3 4 5 6

75. 我总是在想我身上的脂肪

1 2 3 4 5 6

76. 吃得比别人慢

1 2 3 4 5 6

77. 喜欢上饭店

1 2 3 4 5 6

78. 复用泻药

1 2 3 4 5 6

79. 回避含糖食物

1 2 3 4 5 6

80. 吃减肥食物

1 2 3 4 5 6

81. 觉得食物控制着我的生活

1 2 3 4 5 6

82. 在饮食上很自律

1 2 3 4 5 6

从来不					总是
1	**2**	**3**	**4**	**5**	**6**

83. 觉得别人给我压力让我吃饭

1 2 3 4 5 6

84. 在食物上花太多时间和精力

1 2 3 4 5 6

85. 便秘

1 2 3 4 5 6

86. 吃甜食以后，觉得不舒服

1 2 3 4 5 6

87. 有减肥的行为

1 2 3 4 5 6

88. 喜欢我的胃是空的

1 2 3 4 5 6

89. 喜欢尝试新的油腻味浓的食物

1 2 3 4 5 6

90. 吃完饭后，有把东西吐出来的冲动

1 2 3 4 5 6

如果这份问卷中的任何内容让你感觉不适或是引起你一些不好的回忆，向专业人员咨询一下可能会对你有帮助。在大学里的学生健康中心(Student Health Centre) 有专门的学生咨询服务。该项服务对所有外卡托大学的学生开放，你可以通过电话（07）8384201 进行预约。

如果你有任何关于该调查的疑问，希望与我讨论，欢迎与我联系。我的邮箱地址是
slj2@waikato.ac.nz 电话号码是 021 207 4509。

再次对你的参与和合作表示感激。

Sherida

Appendix D: Example of Poster to Recruit Participants

Participants Needed

For a Study on **Eating Patterns** in **Different Cultures**

My study is looking at eating patterns and reasons for those eating patterns, comparing Chinese females to other females who live in New Zealand.

Participants need to fill in a questionnaire which will take about 30 minutes to complete. PSYC102 or PSYC103 students will gain a 1% course credit for completing a questionnaire. However all females are encouraged to participate ☺

All results are kept confidential. Those interested can pick up questionnaires from boxes located outside the **Psychology Office** (K.1.26) and drop them off there once completed. The student's copy of the completed course credit forms will also be available from the Psychology Office.

Hi there my name is Sherida Jenkins and I'm completing my Masters in Psychology here at the University of Waikato. If you have any concerns about this study please contact me at slj2@waikato.ac.nz, otherwise contact my supervisors Nicola Starkey (nstarkey@waikato.ac.nz) or Mary Foster (m.foster@waikato.ac.nz).

Appendix D: Item-Total Correlations of the EAT-40 for Chinese and Other Ethnicities

EAT Item (Questionnaire Item)	Chinese (N=44)	Other (N=71)
1 (51)	-.262	.276 *
2 (52)	.405 *	.161
3 (53)	.415 *	.627 *
4 (54)	.601 *	.771 *
5 (55)	.416 *	.570 *
6 (56)	.466 *	.651 *
7 (57)	.585 *	.678 *
8 (58)	.401 *	.377 *
9 (59)	.193	.691 *
10 (60)	.496 *	.524 *
11 (61)	.205	.605 *
12 (62)	.365 *	.097
13 (63)	.095	.529 *
14 (64)	.725 *	.696 *
15 (65)	.706 *	.706 *
16 (66)	.150	.600 *
17 (67)	.232	.529 *
18 (68)	.156	-.071
19 (69)	.005	.204
20 (70)	.497 *	.112
21 (71)	.273	.536 *
22 (72)	.206	.686*
23 (73)	.189	.032
24 (74)	.077	.150
25 (75)	.757 *	.788 *
26 (76)	.240	.009
27 (77)	-.216	.206
28 (78)	-.030	.270 *
29 (79)	.124	.318 *
30 (80)	.391 *	.369 *

31 (81)	.424 *	.761
32 (82)	.123	.005
33 (83)	.330 *	.172
34 (84)	.016	.741 *
35 (85)	.372 *	.576 *
36 (86)	.512 *	.588 *
37 (87)	.369 *	.740 *
38 (88)	.491 *	.591 *
39 (89)	-.049	.232
40 (90)	.436 *	.560 *

*p<.05