

EXPLORATION OF THE EFFECTS OF PERFECTIONISM ON  
DISTURBED EATING BEHAVIORS AMONG ASIAN-  
AMERICAN COLLEGE STUDENTS

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## ABSTRACT OF THE THESIS

### Exploration of the Effects of Perfectionism on Disturbed Eating Behaviors among Asian-American College Students

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## ABSTRACT OF THE THESIS

With a burgeoning increase in the incidence and prevalence of eating disorders, studies of disturbed eating behaviors have drawn extensive attention in the past decades. Although contributing factors are not fully understood, ample and robust evidence exists indicating a positive relationship between disturbed eating behaviors and perfectionism. However, although perfectionism is widely studied as a multidimensional construct, research regarding the relation of subdimensions of perfectionism to disturbed eating is still sorely needed. Another pivotal element to take into consideration in this line of research is acculturation, yet even less has been done in terms of examining the effects of acculturation on this interplay. The present study was designed as an attempt to shed light on these issues among an Asian-American college students sample.

There were three major objectives of this cross-sectional study: 1) to confirm the positive association between perfectionism and disturbed eating behaviors among Asian-American college students; 2) to examine the interactions between subdimensions of perfectionism and disturbed eating behaviors among Asian-American college students; and 3) to explore the influence of acculturation on the interplays between perfectionism and disturbed eating behaviors among Asian-American college students.

Drawing on data from 172 Asian-American college students, results of regression analysis confirmed that perfectionism is a strong predictor of disturbed eating behaviors. It was also found that the relationship of disturbed eating behaviors to maladaptive aspects of perfectionism was positively significant ( $p < 0.05$ ), except for adaptive aspects of perfectionism. However, this study did not reveal any significant influence of acculturation on either perfectionism or disturbed eating. In addition, we also detected a positive correlation between BMI and disturbed eating in the manner expected. To summarize, targeting pathological perfectionism could be a promising avenue by which the education on disturbed eating behaviors or even treatment outcomes of eating disorders are maximized. Although results were not significant, a possible buffering effect of acculturation on the association between perfectionism and disturbed eating was suggested by the present study, and it may also imply a general heightened risk of having disturbed eating behaviors among Asian-American college students. It is recommended that future research should be conducted in larger Asian-American community samples to further understand the role of acculturation in maladaptive personal traits and disturbed

eating behaviors.

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## CHAPTER ONE

### INTRODUCTION

The incidence and prevalence of eating disorders have been surging in the past decades drawing extensive concern from the public and professionals (Kessler et al, 2013). While the incidence of eating disorders is relatively high, more universally prevalent are the disturbed eating behaviors (e.g., cognitive restraint eating, excessive concern over body weight and shape) (Fairburn & Beglin, 1990; Zeiler et al, 2016). The presence of disturbed eating behaviors, albeit not necessarily warranting the clinical diagnosis of a threshold eating disorder (i.e., anorexia nervosa, bulimia nervosa and binge eating disorder) (Diagnostic and Statistical Manual of Mental Disorders-5; American Psychiatric Association [APA], 2013), does precede the clinical diagnosis of an eating disorder in most cases (Heatherton & Polivy, 1992; Rotella et al, 2015; Tuschl, 1990), and are usually concomitant with a series of negative health outcomes (Lluch, Herbeth, Mejean & Siest, 2000; National Institute of Mental Health [NIMH], 2011; Quick, McWilliams & Byrd-Bredbenner, 2012).

Cognitive restraint eating, uncontrolled eating, and emotional eating are three commonly seen disordered-eating practices that are embedded in the core features of eating disorders (Herman & Mack, 1975; Rotella et al, 2015; Tuschl, 1990). Cognitive restraint eating usually refers to a strict restraint of food and energy intake in order to control body weight and shape (Herman & Mack, 1975; Stunkard & Messick, 1985), while uncontrolled eating, on the other hand, depicts overeating due to a loss of control

(Karlsson et al, 2000). Emotional eating usually indicates eating as a coping strategy to deal with negative emotion (Karlsson et al, 2000; Stunkard & Messick, 1985).

Several maladaptive personal traits that may account for disturbed eating behaviors have been identified, for example, perfectionism, neuroticism, and dichotomous thinking (Cassin & Ranson, 2005; Farstad, McGeown & von Ranson, 2016; Lilenfeld, Wonderlich, Riso, Crosby & Mitchell, 2006). Perfectionism, as characterized by an extremely high striving for achievement and being self-critical for failure (Frost, Marten, Lahart, & Rosenblate, 1990), has been consistently demonstrated to associate with various disturbed eating behaviors such as bulimic eating and binge eating (Hewitt, Flett & Ediger, 1995; Joiner, Heatherton, Rudd & Schmidt, 1997; McLaren, Gauvin & White, 2011). Furthermore, different dimensions of perfectionism (i.e., personal standards, organization, parental expectation and criticism, concern over mistakes and doubts about actions) have also been investigated to determine which aspects of perfectionism are more attributable to disturbed eating while others are less. Results are less conclusive but evidence indicates that in general maladaptive aspects of perfectionism (i.e., parental expectation and criticism, concern over mistakes and doubts about actions) have shown more consistent and positive relation to disturbed eating behaviors as compared to adaptive aspects of perfectionism (i.e., personal standards and organization) (Bardone-Cone et al, 2007).

Maladaptive personal traits, albeit determined by genetic factors to some degree, are also highly modifiable by multifold environmental factors which either amplify or

mitigate the predisposing effects of maladaptive personal traits (Culbert, Racine & Klump, 2015; Ghaderi, 2001; Klump, Suisman, Burt, McGue & Iacono, 2009). Culture is a prominent environmental factor related to the course of disturbed eating behaviors, given its fundamental influence on society's ideals of body weight and shape, internalization of thinness, and thinness expectancies (Hesse-Biber, Leavy, Quinn & Zoino, 2006; Striegel-Moore & Bulik, 2007). It has been further proposed that acculturation--a product of two different cultures coming into direct contact--is linked to an array of changes in eating and eating-related patterns (Alakaam & Bodzio, 2015; Redfield, Linton & Herskovits, 1936). Studies examining the association between disturbed eating and acculturation among immigrants have generated contradictory results, that is, while some claim strong effects of acculturation on disturbed eating (Ball & Kenardy, 2002; Rich & Thomas, 2008), the findings of others cast doubts on such effects (Akan & Grilo, 1995; Jennings, Forbes, McDermott & Hulse, 2006).

Asian-Americans are an ethnic minority group in the U.S. that has grown the fastest (Hoeffel, Rastogi, Kim & Shahid, 2012). Due to the significant cultural differences between Asia and the U.S., it is posited that the health condition of Asian-Americans may be challenged (Berry, 2002; Chirkov, Lynch & Niwa, 2005). Moreover, although growing evidence suggests that Asian-American individuals are not less susceptible to disturbed eating behaviors and/or eating disorders than Caucasian peers (McCourt & Waller, 1995; Ball et al, 2002; Jennings et al, 2006), studies of the effects of acculturation on disturbed eating have mixed results (Ball & Kenardy, 2002; Jennings, Forbes, McDermott & Hulse,

2006).

Research on disturbed eating has either been confined to one specific disturbed eating behavior (e.g., restraint eating), or has confined its targets to females and/or clinical samples (Quick & Byrd-Bredbenner, 2014), therefore, an epidemiological study in a nonclinical sample with participants of both genders is needed. While evidence in the relationship of perfectionism with disturbed eating and eating disorders is well established, less has been investigated regarding the roles of subdimensions of perfectionism on disturbed eating behaviors. Moreover, to the best of our knowledge, there is a complete void in the literature as to the influence of acculturation on this above interplay among Asian-Americans. Thus, this thesis will lay the ground work for in this field of study.

The remaining of this thesis will be organized as follows. First, a review of the current literature in Chapter Two will help to justify the significance and necessity of this study, and to establish the framework of the study design. Chapter Three is a description of the procedures and instruments for this study. Results will be presented in Chapter Four, and discussion of the results and recommendations for future study will be presented in Chapter Five.

## CHAPTER TWO

### REVIEW OF THE LITERATURE

#### 2.1 Disturbed Eating Behaviors

##### An Overview of Disturbed Eating Behaviors

Eating is one of the most basic functions that humans rely on for survival. However, eating as a behavior *per se* is more than a daily and predictable action. It varies by sociodemographic characteristics such as culture, income, and the level of education (Alakaam & Bodzio, 2015; Goto, Ominami, Song, Murayama & Wolff, 2012; Hiza, Casavale, Guenther & Davis, 2013), and also by individual physical health condition and psychological status (e.g., mood and personal traits) (Booth & Williams, 2015; D’Emden, 2013; Gibson, 2006). An abnormality of one or more variants may cause disturbed eating behaviors, such as restraint eating, uncontrolled eating, binge eating, and emotional eating. Although disturbed eating behaviors from self-starvation to voracity and gorging have persisted for centuries, the systematic study in disturbed eating was initiated in the late 19<sup>th</sup> century, and marked by the wide acceptance of defining anorexia nervosa as a medical condition (Pearce, 2004).

Disturbed eating behaviors usually refer to a wide range of disturbed eating and eating-related practices that are associated with eating disorders (Quick, Byrd-Bredbenner & Neumark-Sztainer, 2013). Although not necessarily warranting the diagnosis of an eating disorder (i.e., anorexia nervosa, bulimia nervosa, and binge eating disorder) (Diagnostic and Statistical Manual of Mental Disorders-5; American Psychiatric



Association [APA], 2013), many disturbed eating behaviors are seen as precursors or warning signs of threshold eating disorders (Heatherton & Polivy, 1992). For example, an array of constant and restrictive dieting behaviors (e.g., counting calories, skipping meals, and avoiding fattening food) are closely associated with anorexia nervosa which is characterized by restriction of energy intake, fear of fat, and disturbance in perception, experience, or over-evaluation of weight or shape (DSM-5, 2013; Heatherton et al, 1992). In addition, while the presence of binge eating behavior (i.e., an abnormal large amount of food intake in a single episode and feelings of guilt with food intake) is among the diagnostic criteria of both bulimia nervosa and binge eating disorder, purging behaviors (e.g., self-induced vomiting, misuse of laxatives, and excessive exercise) are shared among patients of bulimia nervosa (DSM-5, 2013).

It may be wrongfully assumed that without a clinical diagnosis of an eating disorder, disturbed eating is a personal choice and does harm to individual well-being to a minor degree. Far from being a harmless and innocent lifestyle, disturbed eating is positively associated with a variety of negative health conditions (e.g., overweight, macronutrient imbalance, fainting, and irregular heartbeat) as those shared by threshold eating disorders due to the chaotic food and energy intake (Lluch, Herbeth, Mejean & Siest, 2000; National Institute of Mental Health [NIMH], 2011). It has also been reported that impaired psychological well-being (e.g., anxiety and depression) is widely observed among individuals experiencing disturbed eating (Quick, McWilliams & Byrd-Bredbenner, 2012), which as a result further compromises individuals' interpersonal

relationships and social life (Danielson et al, 2012). Moreover, evidence indicates that disordered eating behaviors remain constant and even increase in severity and frequency as time goes by (Neumark-Sztainer, Wall, Larson, Eisenberg & Loth, 2011), which underlines the necessity of identifying and treating disturbed eating behaviors at an early stage.

Three disturbed eating practices, namely, cognitive restraint eating, uncontrolled eating, and emotional eating, have been broadly investigated due to their high incidence among the population and well-established associations with the etiology of various eating disorders (Castro & Lilenfeld, 2005; Herman & Mack, 1975; Rotella et al, 2015; Tuschl, 1990). Cognitive restraint eating, as advanced by Herman's theory of restraint eating (Herman & Mack, 1975), refers to the tendency to restrict food and energy intake as a means to control body weight and shape (Herman & Mack, 1975; Stunkard & Messick, 1985). Uncontrolled eating refers to the tendency of overeating due to a loss of control over food intake, while emotional eating is eating in response to negative emotion cues such as worry, anxiety and stress (Karlsson, Persson, Sjostrom & Sullivan, 2000; Stunkard & Messick, 1985).

### Risk Factors for Disturbed Eating Behaviors

The development and maintenance of disturbed eating behaviors are multifold which involve interactions amongst factors across physiology, psychology, sociology, etc. (Culbert, Racine & Klump, 2015; Ghaderi, 2001; Klump, Suisman, Burt, McGue & Iacono, 2009). For example, there are genetic vulnerabilities that might predispose, not

only influencing pivotal physiological functions (e.g., appetite and weight fluctuation) but also maladaptive personal traits that are related to disturbed eating (e.g., perfectionism and neuroticism) (Culbert et al, 2015). Yet such predisposing vulnerabilities to disturbed eating, on the other hand, can be either magnified or mitigated by environmental elements such as cultural norms, and influences from parents, peers and social media (Bell & Cooper, 2005; McCarthy, 1990).

Personal traits are salient correlates of disturbed eating behaviors and eating disorders (Rotella, Fioravanti & Ricca, 2016). The roles of an array of maladaptive personal traits (e.g., perfectionism, obsessive-compulsiveness, neuroticism) in disturbed eating and diagnostic profiles of eating disorders have been consistent, that is, an elevated level of maladaptive personal traits is positively associated with heightened risks of having disturbed eating (Cassin & Ranson, 2005; Farstad, McGeown & von Ranson, 2016; Lilenfeld, Wonderlich, Riso, Crosby & Mitchell, 2006). Perfectionism, in particular, has been universally accepted as a risk factor that is related to the onset and maintenance of various disturbed eating behaviors as well as the diagnosis of eating disorders (Hewitt, Flett & Ediger, 1995; Joiner, Heatherton, Rudd & Schmidt, 1997; McLaren, Gauvin & White, 2011), yet as a multidimensional construct, the specific effects of subdimensions of perfectionism on disturbed eating is less clear-cut (Bardone-Cone et al, 2007; Boone, Soenenes, Braet & Goossens, 2010).

On the other hand, culture, as an environmental factor that is characterized by its fundamental influence on an internal ideal of body weight and shape, thinness

expectancies, and dietary practices, has prominent influences on eating and eating-related patterns at both individual and group levels (Hesse-Biber, Leavy, Quinn & Zoino, 2006; Nakai, Nin & Noma, 2014).

It has been further proposed that acculturation--a product of two different cultures coming into direct contact--is linked to an array of behavioral and psychological pattern changes in eating (Alakaam & Bodzio, 2015; Redfield, Linton & Herskovits, 1936). With remarkable changes in food availability and accessibility, dietary practices and the societal ideal of body weight and shape, it is believed that the occurrence of disturbed eating behaviors among immigrant populations may be altered, for which the acculturation level is at least partially responsible for (Mintz & Kashubeck, 1999). What remains unknown is in which way and to what degree that acculturation may affect disturbed eating behaviors, given that mixed outcomes have been identified in a multitude of studies (Ball et al, 2002; Jennings et al, 2006; Mintz et al, 1999).

### Measurement of Disturbed Eating Behaviors

Efforts have been made in order to examine a diversity of disturbed eating behaviors, as a result, a body of instruments were developed - as some were designed specifically for the assessment of a single disturbed eating behavior (e.g., the Restraint Scale) (Herman & Mack, 1975) while others contain multiple items to measure an array of disturbed eating behaviors and are usually reported with a global mean score and several subscale scores (e.g., the Eating Disorder Examination Questionnaire (Fairburn & Beglin, 1994), the Dutch Eating Behavior Questionnaire (Van Strien, Frijters, Bergers & Defares,

1986), and the Three-Factor Eating Questionnaire) (Karlsson et al, 2000; Stunkard & Messick, 1985).

The Restraint Scale is one of the earliest instruments designed specifically for the assessment of restraint eating behaviors (Herman & Mack, 1975). According to the theory behind the Restraint Scale, dieting behaviors of restrained eaters are explained by the “counter-regulation” effects that restrained eaters tend to eat more in the presence of either preloads of food or the disinhibitors such as alcohol and dysphoric emotions, and present a high correlation with the “obese” characteristics of obese people (Herman & Mack, 1975). Although it was later found in empirical studies that obese people who scored high on the Restraint Scale (i.e., high level of dieting behaviors) did not necessarily present overeating symptoms (Ruderman & Christenson, 1983), the Restraint Scale is a landmark in the study of eating behaviors and it did reveal the existence of “disinhibiting eating” for the first time. As informed by the Restraint Scale and the findings based on its application, a more comprehensive three dimensional model of human eating behaviors was proposed later by Stunkard and Messick (1985) and two measurements were developed accordingly: the original Three-Factor Eating Questionnaire (TFEQ) (Stunkard & Messick, 1985) and a revised version on the original TFEQ (TFEQ-R18) (Karlsson et al, 2000),

The original TFEQ and the TFEQ-R18 are similar in essence and both contain items to measure Cognitive Restraint Eating. However, variations exist in the other two measures of eating behaviors, that is, while the original TFEQ has two subdimensions

named as Disinhibition and Hunger (Stunkard & Messick, 1985), the TFEQ-R18 refers to its subdimensions as Uncontrolled Eating and Emotional Eating (Karlsson et al, 2000). Although both were commonly used in the measurement of individual variability of eating behaviors (Bond, McDowell & Wilkinson, 2001; Chong et al, 2016; Lesdema et al, 2012), the TFEQ-R18 was adopted in the present study for three main reasons. First, although it was developed in an obese sample, the TFEQ-R18 has demonstrated validity among non-obese populations across a wide range of ethnic and age groups (Chong et al, 2016; De Lauzon et al, 2004; Jauregui-Lobera, Garcia-Cruz, Carbonero-Carreno, Magallares, & Ruiz-Prieto, 2014). Secondly, via item selection and reduction, the TFEQ-R18 was constructed with the most efficient items from the original TFEQ with an enhanced measurement precision but reduced length and burden for participants, therefore, it is easier to use in epidemiological studies (Karlsson et al, 2000). Also, while the dichotomous responses contained in the original TFEQ confines the spectrum of self-reported symptoms and introduces the floor ceiling effect, the TFEQ-R18 successfully circumvents this limitation by introducing a Four-Point Likert-type Scale (Chong et al, 2016; Karlsson et al, 2000).

## 2.2 Perfectionism

### An Overview of Perfectionism

Although there is not a precise and unified definition, perfectionism usually refers to a personal trait that is characterized by setting very high standards for achievement in oneself as well as being extremely self-critical and employing a negative self-evaluation

after failure (Frost, Marten, Lahart, & Rosenblate, 1990). Evidence exists that perfectionism influences all realms of behaviors, such as academia, sports, and social life (Akanbi, 2016; Brodar, Crosskey & Thompson, 2015; Jowett, Hill, Hall & Curran, 2016; Rice, Ray, Davis, DeBlaere & Ashby, 2015), as well as health-related outcomes, including morbidity and mortality (Fry & Debats, 2009; Fry & Debats, 2011; Goodwin, Haycraft, Willis & Meyers, 2011; O'Connor, Rasmussen & Hawton, 2011).

In some of the earliest historical studies of perfectionism, agreement was only reached on the premise that perfectionism was a unitary personal trait. A relatively consistent view shared among theorists depicts perfectionists as those who set extremely high standards for themselves and are unable to reevaluate the situation when needed, therefore, perfectionism *per se* is seen as a debilitating personality dysfunction that is pathological in essence (Horney, 1950; Pacht, 1984). However, voices can also be heard that perfectionism is a normal and healthy personal trait in striving for excellence which underlies personal growth and development (Adler, 1956; Maslow, 1971). Although the definition has changed little, the traditional idea of perfectionism (i.e., a unitary construct) was first questioned by Hamachek (1978) in his seminal work which proposed a dichotomous perfectionism, that is, normal *versus* neurotic perfectionism. In the early 1990s, a more integral perspective was posited based on emerging evidence which stated that perfectionism should be viewed as a multidimensional construct with different subdimensions that function differently and accordingly to various behaviors or health issues (Frost et al, 1990; Hewitt & Flett, 1991).

The introduction of multidimensional approaches to the studies of perfectionism enables a more comprehensive and accurate understanding of the essence of perfectionism. As a result, two models regarding the multidimensionality nature of perfectionism were proposed by Frost et al. (1990), and Hewitt and Flett (1991), respectively, and have been widely used since then. According to Frost et al. (1990), perfectionism may be subcategorized into six subdimensions, that is, 1) high personal standards for oneself, 2) over-emphasis on precision, orderliness and organization, 3) considerable attention on parental expectation and 4) parental criticism, 5) concern over mistakes in performance and 6) doubts about the quality of actions. Hewitt and Flett (1991) came up with a different model which postulated that perfectionism should be differentiated in three facets, that is, self-oriented perfectionism, other-oriented perfectionism, and social-prescribed perfectionism. While self-oriented perfectionists are characterized by setting extremely high standards and allowing little flaws in themselves, other-oriented perfectionists hold unrealistic standards and expectations for their significant others, and social-prescribed perfectionists tend to think other people expect perfection from them (Hewitt & Flett, 1991).

### Adaptive and Maladaptive Aspects of Perfectionism

It is important to study perfectionism as a multidimensional construct as the subdimensions of perfectionism are related differently to different aspects of life (Flett & Hewitt, 2006; Hamachek, 1978; Molnar, Reker, Culp, Sadava & DeCourville, 2006; O'Connor et al, 2011; Pearson & Gleaves, 2006). For example, a study conducted by Fry



and Debats (2011) found a negative correlation between trait perfectionism and mortality, however, when dysfunctional aspects of perfectionism were examined separately in the same population, a positive correlation was observed (Fry & Debats, 2011). Another example supporting this idea was that while the relationship between evaluative concern perfectionism and distress can be mediated by hassles, avoidant coping, and perceived social support, only active coping can explain the association between personal standard perfectionism and distress (Dunkley, Blankstein, Halsall, Williams & Winkworth, 2000). The accumulation of such empirical evidence lent momentum to the emerging research which distinguishes the adaptive and maladaptive aspects of perfectionism, as they may differ in their effects on health-related outcomes.

The adaptive (i.e., normal) aspects of perfectionism, based on the two forms model that distinguishes perfectionism (Hamachek, 1978), are usually marked by high personal standards and organization as well as the ability to reassess the situation when needed (Slade & Owens, 1998). Maladaptive (i.e., neurotic) aspects of perfectionism, on the other hand, are characterized by setting unrealistic goals despite of adverse consequences (Frost et al, 1990; Slade & Owens, 1998), and more frequently related to an array of psychopathology such as depression, alcoholism, and eating disorders (Bardone-Cone et al, 2007; Castro & Rice, 2003; Flett & Hewitt, 2006; Pearson et al, 2006).

### Perfectionism and Disturbed Eating Behaviors

As a stable personal trait, perfectionism has far-reaching influences on a wealth of health-related trajectories and outcomes. For example, abundant evidence exists that

perfectionism is a transdiagnostic vulnerability factor that has been shown to be highly prevalent in various types of psychopathology, for example, eating disorders, depression, stress, and social anxiety (Bardone-Cone et al, 2007; Cox & Chen, 2015; Farstad et al, 2016; Rice et al, 2015). As its relation to physical condition of patients, albeit literature is scant, relatively consistent evidence also suggests that a higher level of perfectionism is associated with poorer physical health (Harrison & Craddock, 2016; Molnar et al, 2006). For example, Molnar and colleagues conducted a questionnaire among 492 young adults and concluded that not only was perfectionism predictive for physical health but also that different dimensions of perfectionism correlated differently with physical health (Molnar et al, 2006).

Consensus has been found in both clinical and nonclinical studies claiming that perfectionism underlies the development and maintenance of disturbed eating behaviors (Bardone, Vohs, Abramson, Heatherton & Joiner, 2000; Joiner et al , 1997; McLaren et al, 2011), and it is also a risk factor for various types of eating disorders (Hewitt et al, 1995; Linenfeld et al, 2006). When perfectionism and disturbed eating are co-present, perfectionism will exacerbate the manifestation of disturbed eating behaviors as a result of perfectionists' striving for unrealistic goals. For example, it is common that perfectionists who already present disturbed eating behaviors will diet more strictly and exercise more frequently in order to not only lose or maintain body weight and shape but also to satisfy their strong desire of achievement (Cooper & Fairburn, 2011). Another aspect of perfectionism in relation to disturbed eating behaviors is the fear of failure,

where their fear of being fat or gaining weight can be aggregated among perfectionists (Cooper & Fairburn, 2011). Last, given the subsistence of perfectionistic standards in control over eating, body weight and shape, and fear of fatness, a vicious cycle may take place in which perfectionists fail to achieve their goals in the first place and thus perfectionism acts as a detrimental stimulator that exacerbates disturbed eating behaviors (Cooper & Fairburn, 2011; Heatherton & Baumeister, 1991). An example of the comorbidity of perfectionism and pathological eating is that, when a highly perfectionistic individual perceives himself/herself to behave lower than a certain expectation (e.g., not thin enough), binge eating or restrictive eating may act as a coping strategy to escape from the negative self-evaluation (Heatherton & Baumeister, 1991).

Studies in unitary perfectionism and disturbed eating have progressed largely with systematically congruent results indicating comorbidity between perfectionism and disturbed eating (Bardone-Cone et al, 2000; Hewitt et al, 1995). However, debates remain about the relation of the specific aspects of perfectionism (e.g., adaptive *versus* maladaptive, personal standards/organization *versus* concern over mistakes) to disturbed eating behaviors. That is, while relatively consistent results were found among maladaptive aspects of perfectionism and disturbed eating, results are much less clear as to adaptive aspects of perfectionism (Bardone-Cone et al, 2007; Boone, Soenes & Luyten, 2014; Pearson et al, 2006). For example, two longitudinal studies conducted among adolescents found contradictory results, that is, whereas Boone and his colleagues argued that personal standard perfectionism was related to both body dissatisfaction and bulimic

symptoms (Boone, Soenens & Braet, 2011), it was found by Gustafusson et al, that personal standards in general were not associated with disturbed eating in adolescent girls (Gustafusson, Edlund, Kjellin & Norring, 2009).

### Measurement of Perfectionism

The measurement of perfectionism has been undertaken with both unitary and multidimensional approaches. Prior to the 1990's, perfectionism was conceptualized as a unitary construct, and often measured with the Burns Perfectionism Scale (Burns, 1980). The Burns Perfectionism Scale reflected an unremitting pursuit of high standards but failed to reveal other features of perfectionism. Shortly after the remodeling of multidimensional perfectionism (Frost et al, 1990; Hewitt & Flett, 1991), two multidimensional instruments, (i.e., Frost Multidimensional Perfectionism Scale (FMPS) and Hewitt and Flett Multidimensional Perfectionism Scale), were developed and have been applied extensively in human health-related studies since then.

The FMPS was derived based on the six subdimensions of perfectionism proposed by the Frost model with its subscales being labeled as Personal Standards (PS), Organization (O), Parental Expectations (PE), Parental Criticism (PC), Concern over Mistakes (CM), and Doubts about Actions (DA) (Frost et al, 1990). It has been widely used in health-related studies as it not only provides ample information related to the developmental aspects of perfectionism (e.g., personal standards and organization) but also examines perfectionistic interactions with significant others (e.g., parental expectation and criticism) (Lee & Park, 2011). The FMPS was reported to have good

reliability, with internal consistency value of 0.9 for the global score and ranging from 0.77 to 0.93 for the subscale scores (Frost et al, 1990).

Moreover, with six subscales examining different aspects of perfectionism, the FMPS is considered as a valid measurement for distinguishing the adaptive and maladaptive aspects of perfectionism. Its two subdimensions, namely, Personal Standards and Organization, have been widely used as measures of the adaptive aspects of perfectionism (Frost et al, 1990; Stoeber & Otto, 2006). The Concern over Mistakes and Doubts about Actions, on the other hand, have been consistently classified as and associated with maladaptive aspects of perfectionism (Boone et al, 2014; Frost, Heimberg, Holt, Mattia & Neubauer, 1993; Stoeber & Otto, 2006). Parental Expectation and Parental Criticism are also frequently studied as maladaptive aspects of perfectionism yet have been investigated to a lesser degree (Stoeber & Otto, 2006; Taylor, Papay, Webb & Reeve, 2016). On the basis of viewing perfectionism as a multidimensional construct, it is expected that such studies that distinguish adaptive and maladaptive aspects of perfectionism will provide a more integral and profound perspective in terms of the relationship between specific aspects of perfectionism and their outcomes.

## 2.3 Acculturation

### An Overview of Acculturation

Scholarly interest has recently raised attention to acculturation studies due to the large flow of immigrants around the world. The conceptualization and studies of acculturation have been conducted since the early 20<sup>th</sup> century (Redfield, Linton &

Herskovits, 1936) and approaches have been drawn from various disciplines including but not limited to anthropology, sociology, epidemiology, and psychology, as demonstrated by the establishment of numerous models and theories all in attempts to describe and explain acculturation (Berry, 2002; Berry & Annis, 1974; Redfield, Linton & Herskovits, 1936; Glazer & Gordon, 1964; Weinstock, 1966).

Early on, it was defined by anthropologists that “acculturation comprehends those phenomena which result when groups of individuals having different cultures come into continuous first-hand contact, with subsequent changes in the original cultural patterns of either or both groups” (Redfield, Linton & Herskovits, 1936, p. 145, 146). Later it was further proposed by sociologists that acculturation is a linear and unidirectional construct with an emphasis on social structure (Glazer & Gordon, 1964; Weinstock, 1966). As the concept of acculturation was more popularly studied and applied in psychological research, researchers started to see acculturation as a concept with important attributes that should be examined at an individual level (Berry, 1980; Graves, 1967). More recently, the multidimensional attribute of acculturation has been broadly emphasized, that is, acculturation encompasses a variety of domains that include beliefs, behaviors, and self-identity (Berry, 1980). Among the most widely recognized is Berry’s Model which entails a two-way process of acculturation during which acquisition of the host culture does not necessitate a discard of heritage culture. In turn, a retention of heritage culture does not force a rejection to one’s host culture either (Berry, 1997; Berry, 2002).

Acculturation plays a vital role in ethnic group research. As many studies have

pointed out, it permeates every single aspect of people's lives, for instance, from dietary preferences to sexual norms, from school performance to career choices. A longitudinal study that drew data from a nationally representative sample of adolescents indicated that acculturation status influences Asian-American adolescents' sexual behaviors in two ways, that is, the earlier and longer exposure to western society increases the likelihood of 1) initiating premature sexual intercourse, and 2) having multiple sexual partners (Tong, 2013). Another illustration was a study among Chinese-American fifth and sixth graders which found gender and acculturation differences on occupational orientation, that is, self-realization being more valued by more acculturated/ westernized children than less acculturated/Asian children (Leong & Tata, 1990).

### Acculturation and Health

With respect to the effects that acculturation has on health practices and disease outcomes, much work has been done, however, results have been inconsistent and even contradictory. First, the relation of acculturation to both positive and negative health practices was observed among Asian immigrants in western society. For example, results of regression analysis from a large community-based epidemiological study among Asians living in the DC metropolitan area showed that, various measures of acculturation were all positively associated with the odds of having three types of cancer screenings (i.e., colorectal, cervical, and breast) (Lee, Chen, Jung, Baezconde-Garbanati & Juon, 2014). However, another study conducted among female Asian immigrants in Australia indicated strong effects of western acculturation on increasing abnormal dietary practices

(Ball & Kenardy, 2002).

In the meantime, both physical and mental disease outcomes are differently correlated with acculturation status as demonstrated by a few studies. For example, Marmot and Syme (1976) found that westernized Japanese-Americans showed a three-to-five-fold excess in the prevalence of coronary heart disease (Marmot & Syme, 1976), and Venkatesh and colleagues found connections between acculturation status and poorer glycemic control in Asian Indians (Venkatesh, Weatherspoon, Kaplowitz & Song, 2013).

Confounding results of the effects of acculturation have been extensively reported in psychological studies. Whereas more acculturated individuals presenting better mental health outcomes were found in some studies (Alamilla, Kim, Walker & Sisson, 2017; Cheung, 1995; Shin, 1994), reverse effects were observed in others (Ball & Kenardy, 2002; Mui & Kang, 2006; Nguyen & Peterson, 1993). For instance, while a study found that highest acculturated participants showed the lowest rate of psychiatric morbidity among Cambodians living in New Zealand (Cheung, 1995), another study concluded that acculturation to the United States was positively correlated with depressive symptoms (Nguyen & Peterson, 1993). Interestingly, one study revealed that bicultural individuals presented the highest psychological well-being (Baker, Soto, Perez & Lee, 2012).

### Acculturation and Disturbed Eating Behaviors

Dietary changes have always been one of the most closely bound to acculturation (Alakaam et al, 2015; Edward, Hartwell & Brown, 2010; Serafica, 2014). For example, it



was reported that dietary changes were significantly different among international students compared to the U.S. students which is concurrent with poorer health outcomes (Alakaam et al, 2015). In addition, increased body weight has been broadly reported among immigrants in the U.S (Oakkar et al, 2015; Popkin & Udry, 1998; Sundquist & Winkleby, 2000). A longitudinal study examining acculturation status and BMI among Asian-Americans with various ethnicities found that higher generation status, longer residence in the U.S., and earlier age at arrival were all positively correlated with increased risk of being overweight (Oakkar et al, 2015). Given the co-presence of dietary change and weight gain, the occurrence of disturbed eating behaviors could be altered among immigrant populations, for which acculturation degree is at least partially responsible.

Although it is commonly acknowledged that both ethnicity and acculturation status influence immigrants' awareness of body weight and image as well as disturbed eating behaviors (Alakaam et al, 2015; Edward, 2010; Sussman, Truong & Lim, 2007), results as to the outcomes of such influence have been mostly equivocal. On the one side, racial differences in disturbed eating and eating-related patterns were only reported by some studies but not all. For example, a study examining disordered eating and body image between Chinese and Caucasian college students only found gender differences but not racial differences (Baillie & Copeland, 2013), and so did the study conducted by Rich and Thomas (2008) which was designed to investigate the ethnic differences in BMI, disordered eating, and acquisition of health information among college students (Rich et

al, 2008). However, another study sampled in 1, 225 adults of different ethnicities found that Asians had less bingeing and purging behaviors (e.g., vomiting and use of laxatives) compared to Hispanic, Black or White peers (Regan & Cachelin, 2006). Quick and Byrd-Bredbenner (2014), on the other hand, also found ethnic differences in eating concerns, disinhibited eating and emotional eating among a group of college women, but they concluded that it was Black women who had higher self-esteem and were less pressured by social imagine of thinness (Quick and Byrd-Bredbenner, 2014), while Akan and Grilo (1995) reported more disturbed eating and body dissatisfaction among Caucasians relative to Black and Asians who had few variation in those domains (Akan and Grilo, 1995).

The examination of the influences of acculturation further muddled the results. For example, although Akan and Grilo did observe racial differences in disturbed eating and body dissatisfaction, they concluded that acculturation was unrelated to those variations on the measures (Akan & Grilo, 1995). One study that surveyed a large community sample of 14,779 young Australian women found that the risk factors for eating disorders were present regardless of ethnic groups, yet longer stay in Australia was related to more Westernized weight-related thoughts and behaviors adopted by Australian-born women (Ball & Kenardy, 2002). Similar results were observed by another research group which claimed that the presentation of disturbed eating behaviors showed few differences among Hispanic, Asian, Black, and Caucasian women, and yet more acculturated individuals were more likely to suffer from disturbed eating behaviors (Rich et al, 2008).

Interestingly, one study that was conducted among college students of Asian and Caucasian descent found neither racial nor acculturation differences on disordered eating attitudes or psychopathology (Jennings, Forbes, McDermott & Hulse, 2006).

### Acculturation in Asian-Americans

Traditionally, it was believed that disturbed eating behaviors, extreme pursuit for thinness, as well as eating disorders, are all culture-bound phenomena with a higher prevalence in Caucasian populations (Mintz & Kashubeck, 1999). However, with westernization, the large flow of immigrants, and widespread social ideal of thinness, disturbed eating behaviors and eating disorders have recently become a global epidemic that has ascending occurrence in other ethnic groups as well (Chisuwa & O'Dea, 2010; Gordon, 2001; Nakai et al, 2014; Pike, Hoek & Dunne, 2014; Rich & Thomas, 2008).

The Asian population is the third highest in prevalence of minority groups in the U.S. A report of the 2010 Census from U.S. Census Bureau indicated that 17.3 million (or 5.6 percent of) people living in the U.S. self-identified as Asian, either alone or in combination with any other one or more ethnic groups, with Chinese (4.0 million) being the largest single Asian group followed by Filipinos (3.4 million) and Asian-Indians (3.2 million) (Hoeffel, Rastogi, Kim & Shahid, 2012). The same report further indicated that Asian was the ethnic group that had grown the fastest (i.e., at least 30 percent increase in all states except for Hawaii) than any other ethnic groups from 2000 to 2010 with a rate of increase four times faster than the total U.S. population (Hoeffel et al, 2012).

Furthermore, the prediction has been made that the size of the Asian population will be

increased by 79% by 2050 even with a net international migration being maintained at a constant level of about one million (Ortman & Guarneri, 2009).

Within this ethnic group, half of Asian-Americans are foreign-born and most of them are children or grandchildren of Asian immigrants (Lee et al, 2005), thus, traditional Asian values/beliefs and behaviors are crucial to the well-being of individuals in this community. In the meantime, although going through a rapid increase in numbers, the Asian population in the U.S. is still an immigrant population and an ethnic minority group. Together with the predominant existence of traditional Asian values/beliefs and practices, Asian-Americans could have found themselves in a variety of cultural-related changes or even conflicts (e.g., language barriers, dietary changes and racism), resulting in increased psychological pressure.

Moreover, evidence indicates that cultural distance (i.e., difference) is a predominant factor that impedes the process of acculturation across various domains, for example, languages, family structure, and social norms (Berry, 2002; Chirkov, Lynch & Niwa, 2005). With a pre-existing huge cultural distance between Asian immigrants and Americans, it is predictable that Asian-Americans are confronted with a more difficult acculturation process compared to European immigrants in the U.S. who share more similarities to American culture. Consequently, it is of vital importance to understand how Asian-Americans navigate themselves through this acculturation process.

### **Measurement of Acculturation**

Proxy measures have been frequently employed in examining immigrants'

acculturation status. Such measuring often employs using a single question or a simple combination of a few questions to measure acculturation status. Examples of using proxy questions to measure acculturation status include language preferred (an Asian language versus English), the length of residency of host country (e.g., U.S.), age at arrival, and self-identity, etc. However, it has been widely questioned whether proxy measures are adequate to capture the complexity of acculturation, especially when health research is involved. For starters, proxy measurement problematically assumes that the acculturation process is unidirectional and uni-dimensional, and thus it may awkwardly fit any explicit theoretical model in health research (Salant & Lauderdale, 2003). In the meantime, conclusions cannot be drawn by proxy measures in terms of whether acculturative phenomena are a result of adopting host culture, or of discarding heritage culture, or both (Schwartz et al, 2011). Moreover, health condition and disease etiology could be generically predisposed which would be easily obscured by using a single proxy question to predict acculturation status, causing bias.

A series of different scales have been specifically developed to measure the acculturation status of Asian immigrants. As cited by Suinn's review in 2010 (Suinn, 2010), examples of the most widely applied scales are the Asian Values Scale (Kim, Atkinson & Yang, 1999), the Asian American Multidimensional Acculturation Scale (Chung, Kim & Abreu, 2004), and the Suinn-Lew Asia Self-Identity Acculturation Scale (SL-ASIA; Suinn, Rickard-Figueroa, Lew & Vigil, 1987).

Derived from the Acculturation Rating Scale for Mexican Americans (Cuellar,

Harris & Jasso, 1980), the SL-ASIA was later developed within the context of psychological well-being of Asians (Suinn, Rickard-Figueroa, Lew & Vigil, 1987). It was originally developed using student samples (Suinn et al., 1987; Suinn, Ahuna & Khoo, 1992) but has been tested in a non-student sample as well (Ownbeys & Horridge, 1998), showing satisfactory reliability and validity. The instrument was validated using generational differences and duration of stay in the host country (Suinn et al, 1987; Suinn et al, 1992).

The original SL-ASIA Scale was chosen as the single measure of acculturation in the present study based on three grounds as proposed by Suinn et al: first, it conceptualizes acculturation as a multi-dimensional construct; second, items from the original SL-ASIA Scale provide information that covers three domains of acculturation (i.e., behaviors, values and self-identity) comprehensively; lastly, the SL-ASIA is able to differentiate biculturalism from western-identity and Asian-identity (Suinn et al., 1987). These three factors have been universally recognized as the principles for studies of acculturation so have been within the context of Asian-Americans, therefore, results of this study could be comparable to the existing literature.

### Summary and Objectives

It is recommended that the research on eating behaviors should be addressed in a sociocultural context, as they could be partly influenced by a societal ethos of “cult of thinness” which is especially true for females (Aila, Edlund, Kjellin & Norring, 2008; Ghaderi, 2001; Hewitt et al, 2003; Smolak & Murnen, 2001). As in his review article,

Ghaderi argued that incorporating the sociocultural factors in the critical thinking and evaluation in the reconstruction of thin ideal and treatment of eating disorders could be fundamentally important (Ghaderi, 2001).

To summarize, research on the association between acculturation and health would not only help policy makers working with immigrants and ethnic minority groups to initiate and establish regulations contributing to the safety, stability and development of society but also assist health professionals and social workers in promoting public health and well-being.

Therefore, the objectives of this study were to:

- 1) confirm the positive correlations between perfectionism and disturbed eating behaviors among Asian-American college students;
- 2) examine the relationships of subdimensions of perfectionism with disturbed eating behaviors among Asian-American college students; and
- 3) explore the influences of acculturation on the interplay between perfectionism and disturbed eating behaviors among Asian-American college students.

## CHAPTER THREE

### METHODOLOGY

This research protocol was reviewed and approved by the Rutgers University Institutional Review Board for the Protection of Human Subjects in Research, and informed consent was obtained from all participants.

#### 3.1 Subjects

All subjects were recruited from the Rutgers University, New Brunswick campus. Recruitment procedures included posting flyers (Appendix A) on five university student activity centers after approval (i.e., Busch Student Center, College Avenue Student Center, Cook Student Center, Douglass Student Center, and Livingston Student Center); making announcements on a Sakai webpage via contacting instructors from various departments (e.g., Nutritional Sciences, Psychology, Asian Languages and Cultures) that were teaching large general education courses in Fall 2016 Semester; and sending email invitations through departments (e.g., Nutritional Sciences and Food Science) and Rutgers Listserv (i.e., Cook Campus Listserv). Study sites were online.

#### 3.2 Procedures

Participation in the study was voluntary. Each individual who decided to participate in the study was first provided with a consent form (Appendix B) on the study webpage, and then was able to proceed to the survey upon agreement. Once participants agreed to participate, they could click the “I Agree” button at the bottom of the consent form,



which directed them to the survey. If any participants did not agree to participate, they could click the “I Do Not Agree” button and leave the page.

The survey took each participant about 15 minutes to complete. Based on the software setting, participants were required to answer every single question in order to move forward to the next survey block although they were free to end their participation anytime by closing the webpage without any penalty to them. Each participant would only participate in the study on one occasion.

The data collection procedure was confidential and participants’ confidentiality was protected. We did not record the participants’ names, addresses, phone numbers, or dates of birth, etc. The data collection period for the study was from September 2016 to December 2016. The electronic records were kept on a password-secured server and will be for approximately five years, at which point they will be permanently deleted from the server.

There were no foreseeable risks to participate in the study. Participants were informed they would benefit from gaining a better understanding of how their personal traits interact with eating and eating-related behaviors.

### 3.3 Instruments

Based on the objectives of the present study, a questionnaire was developed by combining questions from three previously developed questionnaires that cover information of levels of acculturation, perfectionism, and disturbed eating behaviors (Appendix C).

Demographic data were acquired by asking questions on gender, age group, major, GPA range, and height and weight. Levels of acculturation, perfectionism and disturbed eating behaviors were measured by three previously developed questionnaires (i.e., the TFEQ-R18, the FMPS, and the SL-ASIA) which have been employed worldwide in the relevant research. The degree of acculturation was measured by single choice questions while perfectionism and disturbed eating behaviors were all measured using Five-point Likert Scales.

#### (1) Acculturation

Suinn-Lew Asia Self-Identity Acculturation Scale (SL-ASIA) was used to assess the acculturation level of participants (Suinn et al., 1987). It is a 21-item multiple-choice questionnaire that covers questions on language (4 items), identity (4 items), friendship preferences (4 items), behaviors (5 items), generation/geographic history (3 items), and attitudes (1 item) (Suinn et al., 1987). Every item is scored on a 1-5 Likert-type Scale and a mean score is calculated by averaging items. High, medium, and low scores on the SL-ASIA reflect high, medium, and low levels of acculturation, i.e., a mean score of 1 indicates lowest acculturation level (i.e., highest Asian identification) while a mean score of 5 indicates highest acculturation level (i.e., highest Anglicized identification) (Suinn et al., 1987; Suinn et al, 1992). Sample questions from the SL-ASIA are: 1) What language can you speak? (language); 2) How do you identify yourself? (identity); 3) Do you participant in Asian occasions, holidays, tradition, etc? (behavior).

#### (2) Perfectionism

The Frost Multidimensional Perfectionism Scale (FMPS) was employed to measure the degree of perfectionism (Frost et al, 1990). There are total of 35 items in the FMPS with questions covering six subdimensions of perfectionism, that is, Personal Standards (PS, 7 items), Organization (O, 6 items), Parental Expectations (PE, 5 items), Parental Criticism (PC, 4 items), Concern over Mistakes (CM, 9 items), and Doubts about Actions (DA, 4 items) (Frost et al, 1990). Every item is scored on a 1-5 Likert-type Scale and a global mean FMPS score is calculated by summing up all the items and dividing it by 35; six subscale scores of the FMPS were also derived in a similar way. A higher global score indicates higher level of perfectionism in general, and a higher subscale score demonstrates higher level of perfectionism in a specific dimension. Some sample questions drawn from the FMPS are: 1) It is very important to me that I be thoroughly competent in everything I do (PS); 2) I try to be an organized person (O); 3) My parents set very high standards for me (PE); 4) As a child, I was punished for doing things less than perfect (PC); 5) If I fail partly, it is as bad as being a complete failure (CM); 6) It takes me a long time to do something “right” (DA) (Frost et al, 1990).

### (3) Disturbed Eating Behaviors

The reduced version of the Three Factor Eating Questionnaire (TFEQ-R18) was used to examine three aspects of disturbed eating behaviors, that is, cognitive restraint eating (CR, 6 items), uncontrolled eating (UE, 9 items) and emotional eating (EE, 3 items) (Karlsson et al, 2000). Every item is scored on a 1-5 Likert-type Scale and a global score of the TFEQ-R18 is calculated by summing up all the items and dividing it by 18; three

subscale scores of the TFEQ-R18 were also derived in a similar way. A higher global score indicates higher level of disturbed eating behaviors in general, and a higher subscale score demonstrates higher level of disturbed eating behavior in a specific aspect. Sample questions from the TFEQ-R18 include: 1) I deliberately take small helpings as a means of controlling my weight (CR); 2) I am always hungry so it is hard for me to stop eating before I finish the food on my plate (UE); 3) When I am anxious, I find myself eating (EE) (Karlsson et al, 2000).

### 3.4 Statistical Analysis

All statistical analyses were carried out using SPSS Version 23.0 (SPSS Inc., Chicago, IL). The characteristics of the participants (i.e., gender, age group, GPA range and BMI) were examined by Chi-square tests to see if they differ by acculturation levels. Cronbach's alpha for internal consistency was run to evaluate the reliability of each instrument. To assess the interactions among acculturation, perfectionism and disturbed eating behaviors, bivariate analyses were performed for both the global scores of all three variables and subscale scores of perfectionism and disturbed eating behaviors. To determine the relationship of individual characteristics with disturbed eating behaviors, t-tests, one-way ANOVA, and bivariate correlation analyses were conducted separately. Lastly, a series of hierarchical linear regression analyses were performed in order to further determine the predictive abilities of perfectionism for disturbed eating behaviors and to explore the role of acculturation in the above interplay.

## CHAPTER FOUR

### RESULTS

#### 4.1 Characteristics of the Participants

Data was collected from 172 participants. Participants' demographic characteristics, such as, gender, age group and GPA range, as well as an anthropometric characteristic (i.e., BMI), are all presented in Table 1. Chi-square tests were performed to examine differences between participants' characteristics based on acculturation levels (i.e., low *versus* high). BMIs were calculated by the body mass divided by the square of body height based on participants' responses and rounded to the nearest tenth. Acculturation levels were measured with the Suinn-Lew Asian Self-Identity Acculturation Scale (SL-ASIA) with a score of 5 indicating highest level of western acculturation and a score of 1 indicating lowest level of western acculturation. A mean score of 3.00 on the SL-ASIA was used as the cut-off for acculturation level, that is, a mean score less than or equal 3.00 was categorized into the low acculturation group and a mean score higher than 3.00 was categorized into the high acculturation group. All the data were self-reported.

In general, Table 1 shows that the sample was mostly female, with female participants consisting of about three-fourths of total, and most of the participants (88.4%) fell into the age group of 18-24 years old. The majority of the sample ranked high in GPA (i.e., more than 70% of the participants had a GPA of 3.000 or higher), although there was a small portion of participants (15.1%) who chose to not reveal their GPAs.

**Table 1: Demographic and anthropometric characteristics of the sample by acculturation levels**

	Total N = 172	Acculturation Level <sup>a</sup>		<i>p</i> value <sup>b</sup>
		Low N =68	High N =104	
Gender				.003
Male	42 (24.4%)	15 (8.7%)	27 (15.7%)	
Female	130 (75.6%)	81 (47.1%)	49 (28.5%)	
Age Group (year)				.001
18-24	152 (88.4%)	78 (45.3%)	74 (43.0%)	
≥ 25	20 (11.6%)	18 (10.5%)	2 (1.2%)	
BMI				< 0.001
Underweight (BMI< 18.5)	11 (6.4%)	10 (5.8%)	1 (.6%)	
Normal Weight (18.5≤BMI< 25)	120 (68.8%)	74 (43.0 %)	46 (26.7%)	
Overweight/Obese (BMI ≥ 25)	41 (23.8%)	12 (7.0%)	29 (16.9%)	
GPA Range				.205
3.500-4.000	72 (41.9%)	43 (25.0%)	29 (16.9%)	
3.000-3.499	54 (31.4%)	26 (15.1%)	28 (16.3%)	
≤ 2.999	20 (11.6%)	9 (5.2%)	11 (6.4%)	
I prefer not to answer	26 (15.1%)	18 (10.5%)	8 (4.7%)	

*Note.* N=172. <sup>a</sup>The cut-off of acculturation level is a mean score on the Suinn-Lew Asian Self Identity Acculturation Scale of 3.00. <sup>b</sup>*p* values were two-sided and from Chi-square tests. Entries in Parenthesis were percentage of variables.

As shown in Table 1, there was no significant differences in GPA range based on the participants' acculturation level. However, data indicated that gender and age group were significantly different by acculturation level. It was shown that: 1) the low acculturation group composed a higher percentage of female participants than the high acculturation group, and 2) a larger percentage of participants in the high acculturation group fell into the age category of 18-24 as compared to the low acculturation group. Notably, BMI was significantly different by acculturation level, that is, individuals in the low acculturation

group were significantly more likely to be underweight compared to high acculturation group (5.8% in the low *versus* 0.6% in the high acculturation group), whereas individuals in the high acculturation group were significantly more likely to be overweight/obese relative to the low acculturation group (16.9% in the high *versus* 7.0% in the low acculturation group).

#### 4.2 Associations among Perfectionism, Disturbed Eating Behaviors and Acculturation

In order to examine the relationships of perfectionism with disturbed eating and acculturation, bivariate correlation analyses were conducted with measure from the Frost Multidimensional Perfectionism Scale (FMPS), the Three-Factor Eating Questionnaire (TFEQ-R18) and the Suinn-Lew Asian Self-Identity Scale (SL-ASIA), all measured on 5-Point Likert-type Scales. Tables 2a and 2b present descriptive statistics of each measure and correlation analyses among them.

**Table 2a: Mean, Standard Deviations and Cronbach's  $\alpha$ s of the global scores on the FMPS, the TFEQ-R18, and the SL-ASIA**

	Mean	SD	Cronbach's $\alpha$
Perfectionism (FMPS)	3.21	.67	.939
Disturbed Eating Behaviors (TFEQ-R18)	2.72	.64	.851
Acculturation (SL-ASIA)	2.90	.90	.943

*Note.* N=172. SL-ASIA-Suinn-Lew Asian Self-Identity Acculturation Scale. FMPS-Frost Multidimensional Perfectionism Scale. TFEQ-R18-Three-Factor Eating Questionnaire. SD-Standard Deviations.

Based on the means and standard deviations of the three global mean scores on the SL-ASIA, the FMPS and the TFEQ-R18 in Table 2a, it was found that our sample: 1) scored slightly above average on perfectionism; 2) had a global score on disturbed eating close to but still slightly lower than the average; and 3) had a medium level of acculturation to the western culture (i.e., the U.S. culture). It is also indicated in Table 2a that each scale demonstrated satisfactory reliability in the present sample as suggested by Cronbach's *alphas* internal consistency scores.

Table 2b shows the results of the bivariate correlation analyses. The global score on the FMPS was positively and significantly related to the global score on the TFEQ-R18 ( $r=.322, p<.01$ ), indicating that higher levels of perfectionism was related to increased disturbed eating behaviors. However, results did not show any significant correlations between the global score of the SL-ASIA and any other measure.

**Table 2b: Correlations among the global scores on the FMPS, the TFEQ-R18, and the SL-ASIA**

	1	2	3
1. Perfectionism (FMPS)		.322**	-.001
2. Disturbed Eating Behaviors (TFEQ-R18)			-.024
3. Acculturation (SL-ASIA)			

*Note.* N=172. \*\*Correlation is significant at the .01 level (two-tailed). FMPS-Frost Multidimensional Perfectionism Scale. TFEQ-R18-Three-Factor Eating Questionnaire. SL-ASIA-Suinn-Lew Asian Self-Identity Acculturation Scale.

To further examine the effects of subdimensions of perfectionism on different measures of disturbed eating behaviors, a second correlation bivariate analysis was



performed using subscale scores from the Perfectionism Scale (FMPS) and the Eating Questionnaire (TFEQ-R18) which were both measured with 5-Point Likert-type Scales. Table 2c and 2d present descriptive statistics of an array of subscale scores from the FMPS and the TFEQ-R18, and the correlations among them.

**Table 2c: Mean, Standard Deviations and Cronbach's  $\alpha$ s of the subscale scores on the FMPS and the TFEQ-R18**

	Mean	SD	Cronbach's $\alpha$
<b>FMPS</b>			
Personal Standards	3.43	.83	.846
Organization	3.85	.80	.908
Parental Expectation	3.32	.91	.827
Parental Criticism	2.62	1.06	.836
Concern over Mistakes	2.87	.94	.907
Doubts about Actions	3.08	.97	.836
<b>TFEQ-R18</b>			
Cognitive Restraint Eating	2.72	.76	.750
Uncontrolled Eating	2.70	.80	.837
Emotional Eating	2.79	1.19	.869

*Note.* N=172. FMPS-Frost Multidimensional Perfectionism Scale. TFEQ-R18-Three-Factor Eating Questionnaire. SD-Standard Deviations.

As presented in Table 2c, variations were observed among the means of subscale scores of the FMPS, with Personal Standards, Organization, Parental Expectation, and Doubts about Actions all presenting subscale scores above the average (i.e., 3.43, 3.85, 3.32, and 3.08, respectively) while Parental Criticism and Concern over Mistakes having subscale scores lower than the average (i.e., 2.62 and 2.87), suggesting that responses to

the various subdimensions of perfectionism vary in our sample. Such variations of means of the three subscale scores of the TFEQ-R18 were slight, with means ranging from 2.70 to 2.79. It is also shown in Table 2c that each subscale of the instruments demonstrated good to excellent reliability (Cronbach's  $\alpha \geq 0.8$ ) except Cognitive Restraint Eating showed acceptable reliability (i.e., Cronbach's  $\alpha = 0.75$ ).

**Table 2d: Correlations among the global scores and the subscale scores on the FMPS and the TFEQ-R18**

	Disturbed Eating Behaviors	Cognitive Restraint Eating	Uncontrolled Eating	Emotional Eating
Perfectionism	.322**	.172*	.271**	.280**
Personal Standards	.181*	.105	.149	.153*
Organization	.116	.088	.074	.114
Parental Expectation	.145	.116	.096	.129
Parental Criticism	.244**	.201**	.167*	.200**
Concern over Mistakes	.339**	.158*	.301**	.294**
Doubts about Actions	.361**	.079	.376**	.312**

*Note.* N=172. \*\* Correlation is significant at the .01 level (two-tailed). \* Correlation is significant at the .05 level (two-tailed).

Table 2d shows that the global perfectionism score on the FMPS was consistently and significantly and positively related to both the global score and each subscale score of the TFEQ-R18. In terms of the associations among subscales of these two instruments, Parental Criticism and Concern over Mistakes were both significantly and positively related to the global score and the three subscale scores of the TFEQ-R18, indicating

heightened levels of both are related to disturbed eating behaviors. Doubts about Actions and Personal Standard were also associated with the global score of the TFEQ-R18, however, Doubts about Actions was also related to Uncontrolled Eating and Emotional Eating while Personal Standard was only related to Emotional Eating. No significant relationship was observed among any types of disturbed eating behavior to Organization or Parental Expectation.

### 4.3 Associations between Participants' Characteristics and Disturbed Eating Behaviors

Before examining the predictive abilities of perfectionism and acculturation on disturbed eating, the characteristics of participants (i.e., gender, age group, GPA range, and BMI) were investigated first to identify their potential confounding effects on the outcomes of disturbed eating behaviors by conducting t-tests, one-way ANOVA and a bivariate correlational analysis, respectively. The t-tests were conducted to examine the differences between gender and age group and various measures of disturbed eating behaviors, one-way ANOVA was conducted to determine the differences between GPA range and disturbed eating behaviors. However, results from the t-tests and one-way ANOVA did not show significant differences (data not shown). A separate bivariate correlational analysis was then performed to examine the relationships among disturbed eating behaviors and BMI (Table 3).

**Table 3: Association between participants' BMI and disturbed eating behaviors**

	1	2	3	4	5
1. BMI		.225**	.109	.178**	.234*
2.TFEQ-R18 Global Score			.557**	.885**	.753**
3.Cognitive Restraint Eating				.187*	.155*
4.Uncontrolled Eating					.618**
5. Emotional Eating					

*Note.* N=172. TFEQ-R18-Three-Factor Eating Questionnaire. \*\*Correlation is significant at the .01 level (two-tailed). \*Correlation is significant at the .05 level (two-tailed).

It is shown in Table 3 that BMI was significantly and positively related to both the global score and two subscale scores of the TEFQ-R18 (i.e., Uncontrolled Eating and Emotional Eating), suggesting that higher BMIs is related to disturbed eating behaviors in general and uncontrolled and/or emotional eating behaviors. However, no significant correlation was observed between BMI and the subscale score of Cognitive Restraint Eating in our sample. Significant correlations exist among the global score of the TEFQ-R18 and three subscale scores of the TEFQ-R18 in the manner as we expected.

#### 4.4 Predictive Abilities of Perfectionism and its Interaction with Acculturation for Disturbed Eating Behaviors

Finally, a series of hierarchical linear regression analyses were performed to determine the predictive ability of perfectionism for each of the four disturbed eating measures (i.e., the global score of the TFEQ-R18, and the subscale score of Cognitive Restraint Eating, Uncontrolled Eating, and Emotional Eating), and to assess the

moderating role of acculturation. To do so, two global scores from the Frost Multidimensional Perfectionism Scale (FMPS) and the Suinn-Lew Asian Self-Identity Scale (SL-ASIA) were first mean centered to avoid multicollinearity, and then two product terms were created by multiplying the centered score of the FMPS by the centered score of the TFEQ-R18 (Aiken, West & Reno, 1991).

Across the four hierarchical linear regression models, the basic models were all consistently adjusted for BMI as informed by the previous results of bivariate correlational analyses. Perfectionism and acculturation were added in Step 2 and Step 3 respectively, and the interaction of acculturation was added in Step 4 across the four models.

As shown in Model 1 (Table 4a), BMI *per se* was significantly and positively related to disturbed eating behaviors and accounted for 5.1% of the variance in disturbed eating. Perfectionism was entered in Step 2, and together with BMI they explained total of 15.8% of the variance in disturbed eating behaviors. It also shows in Step 2 that perfectionism was a strong predictor for global disturbed eating behaviors and it explained 32.7% of the variance of disturbed eating after controlling for BMI while BMI alone can explain 23.2% of the variance after controlling for perfectionism. Acculturation was added in Step 3, and the interaction of acculturation and perfectionism was added in Step 4. Similar changing patterns were observed in Step 3 and 4, that is, both acculturation and the interaction between acculturation and perfectionism presented negative effects on disturbed eating behaviors, and such effects were statistically insignificant.

**Table 4a: Summary for the hierarchical linear regression analysis for predicting global disturbed eating behaviors**

Model 1	B	SE	R <sup>2</sup>	sr <sup>2</sup>	ΔR <sup>2</sup>	F change
Step 1			.051**		.051**	9.093
BMI	.035**	.012		.225		
Step 2			.158**		.107**	21.422
BMI	.037**	.011		.232		
Perfectionism	.314**	.068		.327		
Step 3			.167		.009	1.870
BMI	.041**	.012		.250		
Perfectionism	.314**	.068		.327		
Acculturation	-.072	.053		-.096		
Step 4			.170		.003	.584
BMI	.042**	.012		.252		
Perfectionism	.322**	.069		.332		
Acculturation	-.077	.053		-.102		
Perfectionism × Acculturation	-.054	.071		-.054		

*Note.* N=172. B-Unstandardized Coefficient B. SE-Unstandardized Coefficient Standard Error. R<sup>2</sup>-R Square. sr<sup>2</sup>-squared semipartial correlation, the amount of variance uniquely accounted for by each predictor. ΔR<sup>2</sup>- R Square Change. \*\* Correlation is significant at the .01 level (two-tailed).

In contrast to the results in Model 1 (Table 4a) which showed positive relationship between BMI and global disturbed eating behaviors, BMI alone was not predictive for cognitive restraint eating as shown in Model 2 (Table 4b), as in line with the results from previous bivariate analysis in Table 3. Perfectionism was the only predictor for cognitive restraint eating and it accounted for 17.5% of variance in cognitive restraint eating after

controlling for BMI. Acculturation and the interaction between perfectionism and acculturation were also entered in Step 3 and 4 respectively, and the results showed similar patterns as those found in Model 1 (Table 4a). Neither acculturation *per se* nor the interaction between perfectionism and acculturation presented significant influence on cognitive restraint eating, and if there was any influence found, it was negative.

**Table 4b: Summary for the hierarchical linear regression analysis for predicting cognitive restraint eating**

Model 2	B	SE	R <sup>2</sup>	sr <sup>2</sup>	ΔR <sup>2</sup>	F change
Step 1			.012		.012	2.057
BMI	.020	.014		.109		
Step 2			.042		.031*	5.385
BMI	.021	.014		.113		
Perfectionism	.198*	.085		.175		
Step 3			.050		.008	1.357
BMI	.026	.015		.134		
Perfectionism	.198*	.085		.175		
Acculturation	-.077	.066		-.088		
Step 4			.052		.001	.254
BMI	.026	.015		.135		
Perfectionism	.205*	.086		.179		
Acculturation	-.081	.067		-.092		
Perfectionism × Acculturation	-.045	.089		-.038		

*Note.* N=172. B-Unstandardized Coefficient B. SE-Unstandardized Coefficient Standard Error. R<sup>2</sup>-R Square. sr<sup>2</sup>-squared semipartial correlation, the amount of variance uniquely accounted for by each predictor. ΔR<sup>2</sup>- R Square Change. \* Correlation is significant at the .05 level (two-tailed).

As shown in Table 4c, Model 3 regressed uncontrolled eating on BMI, perfectionism, acculturation and the interaction between perfectionism and acculturation. In the Step 1, it was observed that BMI again was significantly associated with uncontrolled eating and explained 3.2% of the variance in uncontrolled eating. Perfectionism was a significant and positive predictor for uncontrolled eating and accounted for 27.5% of variance of uncontrolled eating after controlling for BMI, while BMI alone could explain 18.3% of the variance after controlling for perfectionism. Running parallel to previous findings as presented in Model 1 (Table 4a) and Model 2 (Table 4b), no significant predictive ability of either acculturation or the interaction between perfectionism and acculturation was observed for uncontrolled eating.



**Table 4c: Summary for the hierarchical linear regression analysis for predicting uncontrolled eating**

Model 3	B	SE	R <sup>2</sup>	sr <sup>2</sup>	ΔR <sup>2</sup>	F change
Step 1			.032 <sup>*</sup>		.032 <sup>*</sup>	5.536
BMI	.035 <sup>*</sup>	.015		.178		
Step 2			.107 <sup>**</sup>		.075 <sup>**</sup>	14.282
BMI	.036 <sup>*</sup>	.014		.183		
Perfectionism	.327 <sup>**</sup>	.087		.275		
Step 3			.110		.003	.509
BMI	.039 <sup>**</sup>	.015		.190		
Perfectionism	.328 <sup>**</sup>	.087		.275		
Acculturation	-.048	.067		-.052		
Step 4			.113		.003	.596
BMI	.039 <sup>**</sup>	.015		.193		
Perfectionism	.338 <sup>**</sup>	.088		.280		
Acculturation	-.055	.068		-.059		
Perfectionism × Acculturation	-.070	.091		-.056		

*Note.* N=172. B-Unstandardized Coefficient B. SE-Unstandardized Coefficient Standard Error. R<sup>2</sup>-R Square. sr<sup>2</sup>-squared semipartial correlation, the amount of variance uniquely accounted for by each predictor. ΔR<sup>2</sup>- R Square Change. <sup>\*</sup> Correlation is significant at the .05 level (two-tailed). <sup>\*\*</sup> Correlation is significant at the .01 level (two-tailed).

As shown in Table 4d, emotional eating was regressed on BMI, perfectionism, acculturation and the interaction between perfectionism and acculturation in Model 4.

First, BMI and perfectionism were both found to be predictive for emotional eating in Model 4. BMI *per se* could explain 23.9% of the variance of emotional eating after adjusting for perfectionism whereas perfectionism accounted for 28.4% of the variance after controlling for BMI. No significant results were found in the predictive abilities of either acculturation or the interaction between acculturation and perfectionism for emotional eating, which is consistent with the results in previous models.

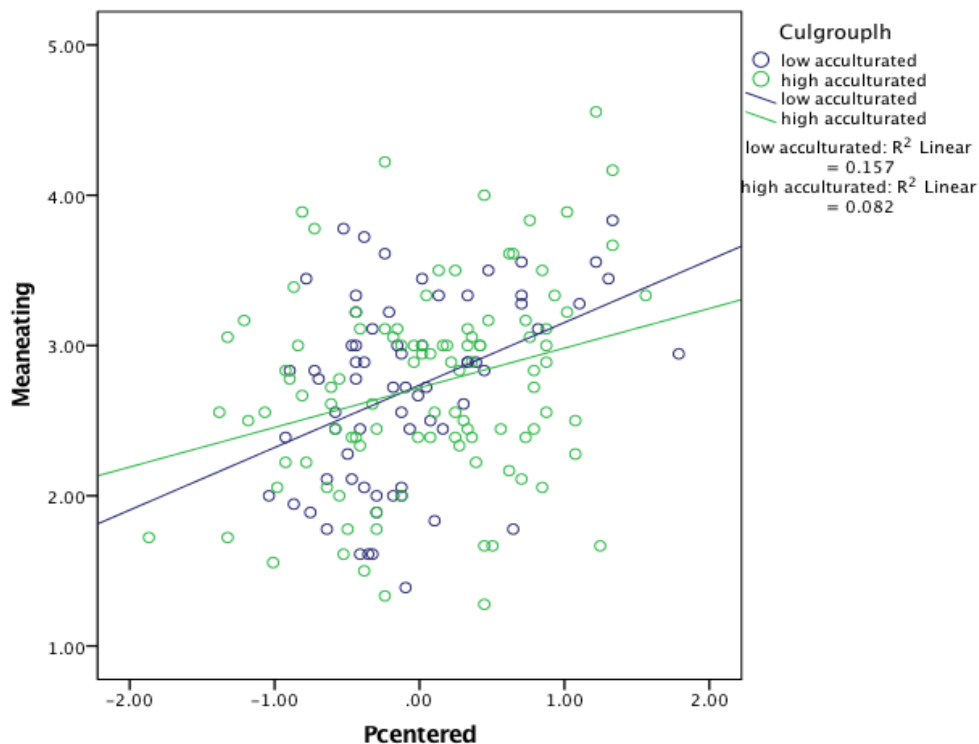
**Table 4d: Summary for the hierarchical linear regression analysis for predicting emotional eating**

Model 4	B	SE	R <sup>2</sup>	sr <sup>2</sup>	ΔR <sup>2</sup>	F change
Step 1			.055**		.055**	9.840
BMI	.068**	.022		.234		
Step 2			.136**		.081**	15.795
BMI	.070**	.021		.239		
Perfectionism	.505**	.127		.284		
Step 3			.145		.009	1.812
BMI	.079**	.022		.257		
Perfectionism	.506**	.127		.285		
Acculturation	-.133	.099		-.096		
Step 4			.145		.000	.033
BMI	.079**	.022		.257		
Perfectionism	.510**	.129		.283		
Acculturation	-.135	.100		-.097		
Perfectionism × Acculturation	-.024	.133		-.013		

*Note.* N=172. B-Unstandardized Coefficient B. SE-Unstandardized Coefficient Standard Error. R<sup>2</sup>-R Square. sr<sup>2</sup>-squared semipartial correlation, the amount of variance uniquely accounted for by each predictor. ΔR<sup>2</sup>- R Square Change. \* Correlation is significant at the .05 level (two-tailed).

Although no statistically significant results were found in terms of the effects of acculturation and the interaction between acculturation and perfectionism on various measures of disturbed eating behaviors as shown in Models 1 to 4, we did observe negative effects of acculturation and its interaction with perfectionism on each of the measures of disturbed eating. To further explore the potential moderating role of acculturation, several scatterplots were drawn.

**Figure 1. Interaction effects of acculturation levels on perfectionism and global disturbed eating behaviors**



*Note.* N=172. Pcentered-Mean centered on the global score of the Frost Multidimensional Perfectionism Scale. Meaneating-Mean global score of the Three-Factor Eating Questionnaire.

Consistent with the hierarchical linear regression analysis, although not statistically significant, the scatter plot confirmed a slight buffering effect of acculturation on

perfectionism and disturbed eating behaviors in general. It demonstrates that the strength of the relationship between perfectionism and disturbed eating changes across acculturation levels, that is, when the acculturation level is higher, the association between perfectionism and disturbed eating behaviors is weaker since acculturation is arguably acting as a buffer between them. Moreover, this buffering effect of acculturation is consistent for four different measures of disturbed eating behaviors (data not shown).

## CHAPTER FIVE

### DISCUSSION

Research on disturbed eating behaviors is growing, however, extant literature has either been confined to one specific disturbed eating behavior (e.g., restraint eating), or has confined its targets to females and/or clinical samples (Quick & Bryd-Bredbenner, 2014), therefore, an epidemiological study in a nonclinical sample with participants of both genders is needed. While a plethora of research in the relationships of perfectionism with disturbed eating and eating disorders has drawn congruent results, studies that examined the roles of subdimensions of perfectionism on disturbed eating behaviors have lagged behind. To the best of our knowledge, there has been a paucity in the literature regarding the impact of acculturation on this above interplay among Asian-Americans. Therefore, this thesis will make an effort to account for the gap in the literature.

As predicted, our results confirmed the positive association between perfectionism and disturbed eating behaviors among Asian-American college students. First, findings from the bivariate correlation analysis revealed that elevated level of global perfectionism is positively related to the disturbed eating behaviors such as cognitive restraint eating, uncontrolled eating and emotional eating. Moreover, it was found by conducting a series of hierarchical linear regression analyses that perfectionism, in general, is a strong predictor for various measures of disturbed eating behaviors after controlling for BMI.

These findings are in line with the extant literature. Both empirical and theoretical evidence indicates that such a consistent and positive relationship exists between

perfectionism and disturbed eating behaviors (Bardone-Cone et al, 2000; Hewitt et al, 1995; McLaren et al, 2011), and perfectionism is also considered as a risk factor for the etiology of eating disorders (Hewitt et al, 1995; Linenfeld et al, 2006).

The second aim of the present study was to examine the relationship between the subdimensions of perfectionism with disturbed eating behaviors, and results showed that variations existed among different subdimensions of perfectionism. In general, maladaptive aspects of perfectionism, as measured by four subscales from the FMPS (i.e., Parental Expectation, Parental Criticism, Concern over Mistakes and Doubts about Actions), presented more consistent and positive relationships with various measures of disturbed eating as compared to adaptive aspects of perfectionism (i.e., Personal Standards and Organization). Overall, these findings collaborate with previous studies, however, several discrepancies exist in the relation of personal standards, parental expectation, and doubts about actions with various measures of disturbed eating behaviors.

First, our study found personal standard was significantly related to overall disturbed eating and emotional eating but not cognitive restraint and uncontrolled eating. Such inconsistent results of the relation of high personal standards to disturbed eating were also reported in previous studies. For example, it was observed that personal standard perfectionism was related to both body dissatisfaction and bulimic symptoms (Boone et al, 2011), however, contradictory results were reported in adolescent girls (Gustafsson et al, 2009).

Secondly, parental expectation usually is considered a maladaptive aspect of perfectionism and presents positive associations with disturbed eating (Stoeber & Otto, 2006; Taylor et al, 2016). Perfectionists perceive their parents' love is conditional as it depends on their capacity to meet their parents' expectation and critical evaluations (Burns, 1980; Hamachek, 1978; Patch, 1984), and perfectionists might resort to disturbed eating behaviors (e.g., binge eating) as a means of internal control when they fail to receive approval from their parents (Slade, 1982). In the present study, although a positive relationship was observed between parental expectation and various measures of disturbed eating, this relation was statistically insignificant. Similar studies have found higher level of parental expectation was not only predictive for less bulimic symptoms but also moderated the impacts of peer influence on bulimic symptoms (Young, Clopton & Bleckley, 2004). Explanations of such an insignificant relation between parental expectation and disturbed eating in our sample could also lie in a cultural-specific background, as parental expectation may demonstrate peculiarities in Asian culture as compared to Eurocentric culture. Although higher parental expectation was reported among Asian students as compared to their counterparts of other ethnic groups (Cheng, Chong & Wong, 1999), it was possible that Asian students saw parental expectation as a manifestation of parental love rather than a cold and harsh over-evaluation (Lee & Park, 2011). Therefore, parental expectation may have a less detrimental impact on our Asian-American students sample.

In addition, it was found in the present study that doubts about actions was

significantly related to various measures of disturbed eating, except for cognitive restraint eating. Since doubts about actions is more likely to demonstrate a lack of confidence and a power of execution, it is less related to cognitive restraint eating which requires a high level of self-restraint.

Our results did not reveal any significant influence of acculturation on perfectionism or disturbed eating behaviors. The lack of effects of acculturation has been frequently reported in previous studies. For example, a study conducted among college women found that although racial differences (i.e., Caucasians *versus* African-American *versus* Asian-Americans) existed in terms of the specific aspects of disturbed eating behaviors, the degree of acculturation and assimilation was unrelated to the variability in relevant disturbed behaviors (Akan & Grilo, 1995).

Some major points of consideration could be made to account for our results. Firstly, it is possible that combining Asian subgroups may have caused methodological problems, as Asian is a term that is encompassed by the vast geographical and cultural diversity. Also, both pre-immigration and post-immigration factors could account for the lack of effects of acculturation (Ramanathan, 2015). Our sample consisted of college students among which the majority could be international students from different Asian countries. However, as these international students are usually from families of higher socioeconomic status and receive good education, our sample in general is more likely to be pre-accultured to western culture, and thus, lowering the effects of acculturation. Another plausible explanation involves the post-immigration environment. It is possible



that whereas the participants in our sample have acculturated to the western society in some way (e.g., English frequency), dietary habits may have changed to a lesser degree due to the food environment. For example, the campus neighborhood has high availability of and accessibility to traditional Asian foods because of the convenient Asian restaurants and markets in the driving distance. Also, as many of the Asian international students prefer to home-cook food, it is likely that they get to keep their traditional cooking routine.

Our study revealed a positive relation of BMI to the global score on the TFEQ-R18 and the subscale scores of Uncontrolled Eating and Emotional Eating, suggesting a higher BMI is associated with increased level of disturbed eating behaviors as well as uncontrolled and/or emotional eating but not cognitive restraint eating. Our findings are consistent with previous findings as similar results have been replicated when the same measuring tool was employed. For example, when the TFEQ-R18 was administered to a group of twins in order to examine the genetic and environmental influences on dieting behaviors and BMI, results showed that BMI was positively (mostly genetically) related to all the dieting behaviors as well as fatty food intake and liking rates (Keskitalo et al, 2008). A factor structure analysis of the original TFEQ conducted by Loffer and her colleagues (2015) not only identified the three behavioral domains which were exactly the same as categorized and labeled by the TFEQ-R18, but also concluded that the relation of BMI to all forms of disturbed eating was positive with uncontrolled eating being the strongest predictor (Loffler et al, 2015).

Although it has been shown that BMI had significant and positive relationships with various disturbed eating behaviors (Keskitalo et al, 2008; Loffler et al, 2015), studies of the relation of BMI to cognitive restraint eating have been mixed with either insignificant or even negative results (Kruger, De Bray, Beck, Conlon & Stonehouse, 2016). For example, similar to our findings, results from an epidemiological study which used the original TFEQ to examine the associations among BMI, body fat percentage and obesity-related behaviors in a group of New Zealand women found significant effects of disinhibition and perceived hunger on BMI but not cognitive restraint eating (Johnson, Bratt & Wardle, 2012; Kruger et al, 2016). One plausible explanation for the inconsistent results between BMI and cognitive restraint eating is that, two types of cognitive restraint eating (i.e., rigid and flexible), as suggested by Westenhoefer, Stunkard and Pudel (1999), may correlate exactly opposite with extreme weight status which is reflected on either high or low BMI. Therefore, when the relation of BMI to cognitive restraint eating is examined in a group of people with different types of restraint eating, the results could be obscured. It is further suggested that studies of the relation of cognitive restraint eating to BMI should be cautious as the level of disinhibition may moderate the interaction between them (Dietrick, Federbusch, Grellmann, Villringer & Horstmann, 2014). Taken together, further studies of the association between BMI and cognitive restraint eating shall look into specific aspects of cognitive restraint eating and its interaction with disinhibition/uncontrolled eating in order to have a better understanding.

Our results did not reveal any influence of gender on disturbed eating behaviors,

which may indicate a heightened risk of disturbed eating among male college students, as it has been reported that males and females are more similar than dissimilar as to the core symptoms of disturbed eating (Lavender, De Young & Anderson, 2010).

## 5.1 Strengths and Limitations

### Strengths

The present study is one of a few studies that examined perfectionism and disturbed eating in both female and male Asian students. Moreover, the lack of gender differences in our results also highlighted the necessity of including both genders as subjects in this line of research in the future.

Also, the present study is one of only a few that explore the phenomenology and correlates of perfectionism's dimensions and various disturbed eating behaviors within an ethnically minor sample. This is of fundamental importance since the correlation between these two constructs should be addressed in specific sociocultural context (Ghaderi, 2001). Another strength of the present study is with the timing and length of data collection. As the data was collected between September 14<sup>th</sup> to December 24<sup>th</sup>, 2016, (i.e., throughout a semester), we expected to collect responses from different participants who had experienced various life hassles and events. This could strengthen the reliability of our results because although personalities are stable and long-term, symptoms of disordered eating are relatively transient and chaotic.

### Limitations

First, it is evident that self-reported cross-sectional questionnaires only have limited

capability of predicting the contents under examination. Within our specific context, results may be further muddled since 1) self-reported health is affected by cultural values and notions of health and wellness (Kandula et al., 2007); 2) distortion and self-denial responses aggregate when questionnaires are used to measure personalities and eating behaviors/attitudes which further compromise the accuracy of self-reported answers (Vitousek & Stumpf, 2004). Therefore, inferences should be made with extra caution. Also, our questionnaire had total 100 items which was relative lengthy for an online survey, as a result, our response and completion rates might have been compromised. Moreover, as the present study is a cross-sectional and correlational study, the results cannot be useful in determining the etiology of disturbed eating and eating disorders.

As it is possible that international college students were the majority of our sample, the results are less representative of general Asian-American population at the same age group. We did not look into the differences among different races of Asians, this might cause methodological problems given the geological and sociocultural diversity embedded within the notion “Asian”, which as a result further smears with its application in subclinical populations.

## 5.2 Recommendations

Although the proliferation of studies examining perfectionism and disturbed eating in the past decades is inspiring, there is still much to be explored. First of all, both prospective and experimental studies are needed. Large longitudinal studies with participants consisting of a wider age range are also desirable. By conducting research in

populations with different age groups who are at different developmental stages, researchers may be able to capture the trajectories of the development of disturbed eating, and thus come up with more comprehensive and effective prevention and treatment programs.

On the other hand, the time has come for the researchers in the area of perfectionism and disturbed eating to examine the effects of different aspects of perfectionism above and beyond the effects of perfectionism as a single concept. Perfectionism in and of itself might not be detrimental, on the contrary, unremitted striving for higher standards is what is embedded in great achievement. Therefore, transforming the maladaptive aspects of perfectionism to the more adaptive aspects of perfectionism might provide a better opportunity for the prevention of disturbed eating and treatment of eating disorders than removing perfectionism as a whole (Flett & Hewitt, 2006). The effects of perfectionism on disturbed eating behaviors are consistently salient. It may be more informative to also look at the interaction of perfectionism with one or more other personal traits (e.g., narcissism, neuroticism, low self-efficacy and low self-esteem), as some perfectionists are more vulnerable to having disturbed eating behaviors while others are not. What remains to be explored includes determining other personal traits and temperament that might be associated with disturbed eating, via either a mediating or moderating path. However, more integrated research like this could be challenging due to the lack of a unified measuring system across different personal traits. (Bachner-Melman, Zohar & Ebstein, 2006; Ro, Martinsen, Hoffart, Sexton & Rosenvinge, 2005).

## References

- Adler, A. (1956). The neurotic disposition. *The individual psychology of Alfred Adler*, 239-262.
- Aiken, L. S., West, S. G., & Reno, R. R. (1991). *Multiple regression: Testing and interpreting interactions*. Sage.
- Akan, G. E., & Grilo, C. M. (1995). Sociocultural influences on eating attitudes and behaviors, body image, and psychological functioning: A comparison of African-American, Asian-American, and Caucasian college women. *International Journal of Eating Disorders*, 18(2), 181-187.
- Akanbi, S. T. (2016). Contributions of perfectionism and social support to the prediction of work-family conflict among women academics in Oyo State, Nigeria. *Gender & Behaviour*, 14(1), 7182-7196.
- Alakaam, A. A., & Bodzio, J. (2015). The factors that influence dietary habits among international students in the United States. *Journal of International Students*, 5(2), 104.
- American Psychiatric Association. (2013). *Diagnostic and Statistical Manual of Mental Disorders (DSM-5®)*. American Psychiatric Pub.
- Alamilla, S. G., Kim, B. S., Walker, T., & Sisson, F. R. (2017). Acculturation, enculturation, perceived racism, and psychological symptoms among Asian American college students. *Journal of Multicultural Counseling and Development*, 45(1), 37-65.
- Aila Gustafsson, S., Edlund, B., Kjellin, L., & Norring, C. (2008). Personal standards, self-evaluation and perceived benefits of thinness in girls and young women with disturbed eating. *European Eating Disorders Review*, 16(6), 463-471.
- Baillie, L. E., & Copeland, A. L. (2013). Disordered eating and body image in Chinese and Caucasian students in the United States. *Eating Behaviors*, 14(3), 314-319.
- Baker, A. M., Soto, J. A., Perez, C. R., & Lee, E. A. (2012). Acculturative status and psychological well-being in an Asian American sample. *Asian American Journal of Psychology*, 3(4), 275.
- Ball, K., & Kenardy, J. (2002). Body weight, body image, and eating behaviours: relationships with ethnicity and acculturation in a community sample of young Australian women. *Eating Behaviors*, 3(3), 205-216.
- Bardone-Cone, A. M., Vohs, K. D., Abramson, L. Y., Heatherton, T. F., & Joiner, T. E. (2000). The confluence of perfectionism, body dissatisfaction, and low self-esteem predicts bulimic symptoms: Clinical implications. *Behavior Therapy*, 31(2), 265-280.
- Bardone-Cone, A. M., Wonderlich, S. A., Frost, R. O., Bulik, C. M., Mitchell, J. E., Uppala, S., & Simonich, H. (2007). Perfectionism and eating disorders: Current status and future directions. *Clinical Psychology Review*, 27(3), 384-405.
- Bell, C., & Cooper, M. J. (2005). Socio-cultural and cognitive predictors of eating disorder symptoms in young girls. *Eating and Weight Disorders-Studies on Anorexia*.
- Berry, J. W. (1980). Acculturation as varieties of adaptations. *Acculturation: Theory, models and some new findings*, 9-23.

- Berry, J. W. (1997). Immigration, acculturation, and adaptation. *Applied Psychology*, 46(1), 5-34.
- Berry, J. W. (2002). *Cross-cultural psychology: Research and applications*. Cambridge University Press.
- Berry, J. W., & Annis, R. C. (1974). Acculturative stress: The role of ecology, culture and differentiation. *Journal of Cross-Cultural Psychology*, 5(4), 382-406.
- Bond, M. J., McDowell, A. J., & Wilkinson, J. Y. (2001). The measurement of dietary restraint, disinhibition and hunger: an examination of the factor structure of the Three Factor Eating Questionnaire (TFEQ). *International Journal of Obesity*, 25(6), 900.
- Boone, L., Soenens, B., & Braet, C. (2011). Perfectionism, body dissatisfaction, and bulimic symptoms: The intervening role of perceived pressure to be thin and thin ideal internalization. *Journal of Social and Clinical Psychology*, 30(10), 1043-1068.
- Boone, L., Soenens, B., & Luyten, P. (2014). When or why does perfectionism translate into eating disorder pathology? A longitudinal examination of the moderating and mediating role of body dissatisfaction. *Journal of Abnormal Psychology*, 123(2), 412.
- Booth, L., & Williams, L. (2015). Type D personality and dietary intake: The mediating effects of coping style. *Journal of Health Psychology*, 20(6), 921-927.
- Brodar, K. E., Crosskey, L. B., & Thompson Jr, R. J. (2015). The relationship of self-compassion with perfectionistic self-presentation, perceived forgiveness, and perceived social support in an undergraduate Christian community. *Journal of Psychology and Theology*, 43(4), 231-242.
- Burns, D. D. (1980). The perfectionist's script for self-defeat. *Psychology Today*, 14(6), 34-52.
- Cassin, S. E., & von Ranson, K. M. (2005). Personality and eating disorders: a decade in review. *Clinical Psychology Review*, 25(7), 895-916.
- Castro, J. R., & Rice, K. G. (2003). Perfectionism and ethnicity: Implications for depressive symptoms and self-reported academic achievement. *Cultural Diversity and Ethnic Minority Psychology*, 9(1), 64.
- Cheng, S. K., Chong, G. H., & Wong, C. W. (1999). Chinese frost multidimensional perfectionism scale: A validation and prediction of self-esteem and psychological distress. *Journal of Clinical Psychology*, 55(9), 1051-1061.
- Cheung, P. (1995). Acculturation and psychiatric morbidity among Cambodian refugees in New Zealand. *International Journal of Social Psychiatry*, 41(2), 108-119.
- Chirkov, V. I., Lynch, M., & Niwa, S. (2005). Application of the scenario questionnaire of horizontal and vertical individualism and collectivism to the assessment of cultural distance and cultural fit. *International Journal of Intercultural Relations*, 29(4), 469-490.
- Chisuwa, N., & O'Dea, J. A. (2010). Body image and eating disorders amongst Japanese adolescents. A review of the literature. *Appetite*, 54(1), 5-15.
- Chong, M. F. F., Ayob, M. N. I. M., Chong, K. J., Tai, E. S., Khoo, C. M., Leow, M. K. S., ... & Wee, H. L. (2016). Psychometric analysis of an eating behaviour questionnaire for an overweight and obese Chinese population in Singapore. *Appetite*, 101, 119-124.

- Cooper, Z., & Fairburn, C. G. (2011). The evolution of “enhanced” cognitive behavior therapy for eating disorders: learning from treatment nonresponse. *Cognitive and Behavioral Practice*, 18(3), 394-402.
- Cox, S. L., & Chen, J. (2015). Perfectionism: A contributor to social anxiety and its cognitive processes. *Australian Journal of Psychology*, 67(4), 231-240.
- Culbert, K. M., Racine, S. E., & Klump, K. L. (2015). Research Review: What we have learned about the causes of eating disorders—a synthesis of sociocultural, psychological, and biological research. *Journal of Child Psychology and Psychiatry*, 56(11), 1141-1164.
- Danielsen, Y. S., Stormark, K. M., Nordhus, I. H., Mæhle, M., Sand, L., Ekornås, B., & Pallesen, S. (2012). Factors associated with low self-esteem in children with overweight. *Obesity Facts*, 5(5), 722-733.
- De Castro, J. M., & Lilenfeld, L. R. (2005). Influence of heredity on dietary restraint, disinhibition, and perceived hunger in humans. *Nutrition*, 21(4), 446-455.
- De Lauzon, B., Romon, M., Deschamps, V., Lafay, L., Borys, J. M., Karlsson, J., ... & Charles, M. A. (2004). The Three-Factor Eating Questionnaire-R18 is able to distinguish among different eating patterns in a general population. *The Journal of Nutrition*, 134(9), 2372-2380.
- D'Emden, H., Holden, L., McDermott, B., Harris, M., Gibbons, K., Gledhill, A., & Cotterill, A. (2013). Disturbed eating behaviors and thoughts in Australian adolescents with type 1 diabetes. *Journal of Paediatrics and Child Health*, 49(4), E317-E323.
- Dietrich, A., Federbusch, M., Grellmann, C., Villringer, A., & Horstmann, A. (2014). Body weight status, eating behavior, sensitivity to reward/punishment, and gender: relationships and interdependencies.
- Dunkley, D. M., Blankstein, K. R., Halsall, J., Williams, M., & Winkworth, G. (2000). The relation between perfectionism and distress: Hassles, coping, and perceived social support as mediators and moderators. *Journal of Counseling Psychology*, 47(4), 437.
- Edwards, J. S. A., Hartwell, H. L., & Brown, L. (2010). Changes in food neophobia and dietary habits of international students. *Journal of Human Nutrition and Dietetics*, 23(3), 301-311.
- Fairburn, C. G., & Beglin, S. J. (1994). Assessment of eating disorders: Interview or self-report questionnaire?. *International Journal of Eating Disorders*, 16(4), 363-370.
- Fairburn, C. G., & Beglin, S. J. (1990). Studies of the epidemiology of bulimia nervosa. *The American Journal of Psychiatry*, 147(4), 401.
- Farstad, S. M., McGeown, L. M., & von Ranson, K. M. (2016). Eating disorders and personality, 2004–2016: a systematic review and meta-analysis. *Clinical Psychology Review*, 46, 91-105.
- Flett, G. L., & Hewitt, P. L. (2006). Positive versus negative perfectionism in psychopathology: A comment on Slade and Owens's dual process model. *Behavior Modification*, 30(4), 472-495.
- Franco-Paredes, K., Mancilla-Díaz, J. M., Vázquez-Arévalo, R., López-Aguilar, X., & Álvarez-Rayón, G. (2005). Perfectionism and eating disorders: A review of the literature.



*European Eating Disorders Review*, 13(1), 61-70.

Frost, R. O., Heimberg, R. G., Holt, C. S., Mattia, J. I., & Neubauer, A. L. (1993). A comparison of two measures of perfectionism. *Personality and Individual Differences*, 14(1), 119-126.

Frost, R. O., Marten, P., Lahart, C., & Rosenblate, R. (1990). The dimensions of perfectionism. *Cognitive Therapy and Research*, 14(5), 449-468.

Fry, P. S., & Debats, D. L. (2009). Perfectionism and the five-factor personality traits as predictors of mortality in older adults. *Journal of Health Psychology*, 14(4), 513-524.

Fry, P. S., & Debats, D. L. (2011). Perfectionism and other related trait measures as predictors of mortality in diabetic older adults: A six-and-a-half-year longitudinal study. *Journal of Health Psychology*, 16(7), 1058-1070.

Galli, N., Petrie, T. A., Greenleaf, C., Reel, J. J., & Carter, J. E. (2014). Personality and psychological correlates of eating disorder symptoms among male collegiate athletes. *Eating Behaviors*, 15(4), 615-618.

Ghaderi, A. (2001). Review of risk factors for eating disorders: Implications for primary prevention and cognitive behavioural therapy. *Scandinavian Journal of Behaviour Therapy*, 30(2), 57-74.

Gibson, E. L. (2006). Emotional influences on food choice: sensory, physiological and psychological pathways. *Physiology & Behavior*, 89(1), 53-61.

Glazer, N., & Gordon, M. M. (1964). Assimilation in American life.

Goodwin, H., Haycraft, E., Willis, A. M., & Meyer, C. (2011). Compulsive exercise: The role of personality, psychological morbidity, and disordered eating. *International Journal of Eating Disorders*, 44(7), 655-660.

Gordon, R. A. (2001). Eating disorders East and West: A culture-bound syndrome unbound. *Eating Disorders and Cultures in Transition*, 1-16.

Goto, K., Ominami, C., Song, C., Murayama, N., & Wolff, C. (2014). Globalization, localization and food culture: perceived roles of social and cultural capitals in healthy child feeding practices in Japan. *Global Health Promotion*, 21(1), 50-58.

Graves, T. D. (1967). *Acculturation, Access, and Alcohol in a Tri-Ethnic Community*. *American Anthropologist*, 69(3-4), 306-321.

Gustafsson, S. A., Edlund, B., Kjellin, L., & Norring, C. (2009). Risk and protective factors for disturbed eating in adolescent girls—aspects of perfectionism and attitudes to eating and weight. *European Eating Disorders Review*, 17(5), 380-389.

Hamachek, D. E. (1978). Psychodynamics of normal and neurotic perfectionism. *Psychology: A Journal of Human Behavior*.

Harrison, F., & Craddock, A. E. (2016). How attempts to meet others' unrealistic expectations affect health: health-promoting behaviours as a mediator between perfectionism and physical health. *Psychology, Health & Medicine*, 21(3), 386-400.

Heatherton, T. F., & Baumeister, R. F. (1991). Binge eating as escape from self-awareness. *Psychological Bulletin*, 110(1), 86.

Heatherton, T. F., & Polivy, J. (1992). Chronic dieting and eating disorders: a spiral

model.

Herman, C. P., & Mack, D. (1975). Restrained and unrestrained eating<sup>1</sup>. *Journal of Personality*, 43(4), 647-660.

Hesse-Biber, S., Leavy, P., Quinn, C. E., & Zoino, J. (2006, April). The mass marketing of disordered eating and eating disorders: The social psychology of women, thinness and culture. In *Women's Studies International Forum* (Vol. 29, No. 2, pp. 208-224). Pergamon.

Hewitt, P. L., & Flett, G. L. (1991). Perfectionism in the self and social contexts: Conceptualization, assessment, and association with psychopathology. *Journal of Personality and Social Psychology*, 60(3), 456.

Hewitt, P. L., & Flett, G. L. (1993). Perfectionistic self-presentation and maladjustment. In P. Hewitt (Chair), *Perfectionism and maladjustment: Refining concepts and establishing relations. Symposium conducted at the 101st Annual Convention of the American Psychological Association, Toronto, Ontario, Canada*.

Hewitt, P. L., Flett, G. L., & Ediger, E. (1995). Perfectionism traits and perfectionistic self-presentation in eating disorder attitudes, characteristics, and symptoms. *International Journal of Eating Disorders*, 18(4), 317-326.

Hiza, H. A., Casavale, K. O., Guenther, P. M., & Davis, C. A. (2013). Diet quality of Americans differs by age, sex, race/ethnicity, income, and education level. *Journal of the Academy of Nutrition and Dietetics*, 113(2), 297-306.

Hoeffel, E. M., Rastogi, S., Kim, M. O., & Hasan, S. (2012). *The Asian population: 2010*. US Department of Commerce, Economics and Statistics Administration, US Census Bureau.

Jennings, P. S., Forbes, D., McDermott, B., & Hulse, G. (2006). Acculturation and eating disorders in Asian and Caucasian Australian university students. *Eating Behaviors*, 7(3), 214-219.

Jáuregui-Lobera, I., García-Cruz, P., Carbonero-Carreño, R., Magallares, A., & Ruiz-Prieto, I. (2014). Psychometric properties of Spanish version of the Three-Factor Eating Questionnaire-R18 (Tfeq-Sp) and its relationship with some eating-and body image-related variables. *Nutrients*, 6(12), 5619-5635.

Johnson, F., Pratt, M., & Wardle, J. (2012). Dietary restraint and self-regulation in eating behavior. *International Journal of Obesity*, 36(5), 665-674.

Joiner Jr, T. E., Heatherton, T. F., Rudd, M. D., & Schmidt, N. B. (1997). Perfectionism, perceived weight status, and bulimic symptoms: two studies testing a diathesis-stress model. *Journal of Abnormal Psychology*, 106(1), 145.

Jowett, G. E., Hill, A. P., Hall, H. K., & Curran, T. (2016). Perfectionism, burnout and engagement in youth sport: The mediating role of basic psychological needs. *Psychology of Sport and Exercise*, 24, 18-26.

Karlsson, J., Persson, L. O., Sjöström, L., & Sullivan, M. (2000). Psychometric properties and factor structure of the Three-Factor Eating Questionnaire (TFEQ) in obese men and women. Results from the Swedish Obese Subjects (SOS) study. *International Journal of*

*Obesity*, 24(12), 1715.

Keskitalo, K., Tuorila, H., Spector, T. D., Cherkas, L. F., Knaapila, A., Kaprio, J., ... & Perola, M. (2008). The Three-Factor Eating Questionnaire, body mass index, and responses to sweet and salty fatty foods: a twin study of genetic and environmental associations. *The American Journal of Clinical Nutrition*, 88(2), 263-271.

Kessler, R. C., Berglund, P. A., Chiu, W. T., Deitz, A. C., Hudson, J. I., Shahly, V., ... & Bruffaerts, R. (2013). The prevalence and correlates of binge eating disorder in the World Health Organization World Mental Health Surveys. *Biological Psychiatry*, 73(9), 904-914.

Klump, K. L., Suisman, J. L., Burt, S. A., McGue, M., & Iacono, W. G. (2009). Genetic and environmental influences on disordered eating: An adoption study. *Journal of Abnormal Psychology*, 118(4), 797.

Kruger, R., De Bray, J. G., Beck, K. L., Conlon, C. A., & Stonehouse, W. (2016). Exploring the relationship between body composition and eating behavior using the Three Factor Eating Questionnaire (TFEQ) in young New Zealand women. *Nutrients*, 8(7), 386.

Lavender, J. M., De Young, K. P., & Anderson, D. A. (2010). Eating Disorder Examination Questionnaire (EDE-Q): norms for undergraduate men. *Eating Behaviors*, 11(2), 119-121.

Lee, S., Chen, L., He, X., Miller, M. J., & Juon, H. S. (2013). A cluster analytic examination of acculturation and health status among Asian Americans in the Washington DC metropolitan area, United States. *Social Science & Medicine*, 96, 17-23.

Lee, D. G., & Park, H. J. (2011). Cross-cultural validity of the frost multidimensional perfectionism scale in Korea. *The Counseling Psychologist*, 39(2), 320-345.

Le Grange, D., Swanson, S. A., Crow, S. J., & Merikangas, K. R. (2012). Eating disorder not otherwise specified presentation in the US population. *International Journal of Eating Disorders*, 45(5), 711-718.

Leong, F. T., & Tata, S. P. (1990). Sex and acculturation differences in occupational values among Chinese-American children. *Journal of Counseling Psychology*, 37(2), 208.

Lesdéma, A., Fromentin, G., Daudin, J. J., Arlotti, A., Vinoy, S., Tome, D., & Marsset-Baglieri, A. (2012). Characterization of the Three-Factor Eating Questionnaire scores of a young French cohort. *Appetite*, 59(2), 385-390.

Lilenfeld, L. R., Wonderlich, S., Riso, L. P., Crosby, R., & Mitchell, J. (2006). Eating disorders and personality: A methodological and empirical review. *Clinical Psychology Review*, 26(3), 299-320.

Liou, D., Bauer, K., & Bai, Y. (2014). Investigating obesity risk-reduction behaviours and psychosocial factors in Chinese Americans. *Perspectives in Public Health*, 134(6), 321-330.

Lluch, A., Herbeth, B., Mejean, L., & Siest, G. (2000). Dietary intakes, eating style and overweight in the Stanislas Family Study. *International Journal of Obesity*, 24(11), 1493.

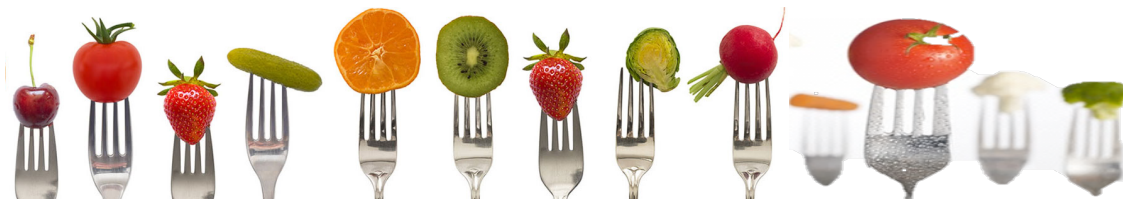
- Löffler, A., Luck, T., Then, F. S., Sikorski, C., Kovacs, P., Böttcher, Y., ... & Engel, C. (2015). Eating behaviour in the general population: an analysis of the factor structure of the German version of the Three-Factor-Eating-Questionnaire (TFEQ) and its association with the body mass index. *PloS one*, *10*(7), e0133977.
- Marmot, M. G., & Syme, S. L. (1976). Acculturation and coronary heart disease in Japanese-Americans. *American Journal of Epidemiology*, *104*(3), 225-247.
- Maslow, A. H. (1971). The farther reaches of human nature.
- McCarthy, M. (1990). The thin ideal, depression and eating disorders in women. *Behaviour Research and Therapy*, *28*(3), 205-214.
- McLaren, L., Gauvin, L., & White, D. (2001). The role of perfectionism and excessive commitment to exercise in explaining dietary restraint: Replication and extension. *International Journal of Eating Disorders*, *29*(3), 307-313.
- Mintz, L. B., & Kashubeck, S. (1999). Body image and disordered eating among Asian American and Caucasian college students: An examination of race and gender differences. *Psychology of Women Quarterly*, *23*(4), 781-796.
- Molnar, D. S., Reker, D. L., Culp, N. A., Sadava, S. W., & DeCourville, N. H. (2006). A mediated model of perfectionism, affect, and physical health. *Journal of Research in Personality*, *40*(5), 482-500.
- Mui, A. C., & Kang, S. Y. (2006). Acculturation stress and depression among Asian immigrant elders. *Social Work*, *51*(3), 243-255.
- Nakai, Y., Nin, K., & Noma, S. (2014). Epidemiological data on eating disorders in Japan. editor, Gramaglia C, Zeppegno P. New Developments in Anorexia Nervosa Research, NY.
- National Institute of Mental Health (NIMH). (2011). *Eating Disorders*. Retrieved from <http://www.nimh.nih.gov/health/publications/eating-disorders/eating-disorders.pdf>.
- Neumark-Sztainer, D., Wall, M., Larson, N. I., Eisenberg, M. E., & Loth, K. (2011). Dieting and disordered eating behaviors from adolescence to young adulthood: findings from a 10-year longitudinal study. *Journal of the American Dietetic Association*, *111*(7), 1004-1011.
- Nguyen, L., & Peterson, C. (1993). Depressive symptoms among Vietnamese-American college students. *The Journal of Social Psychology*, *133*(1), 65-71.
- Oakkar, E. E., Stevens, J., Bradshaw, P. T., Cai, J., Perreira, K. M., Popkin, B. M., ... & Quinn, V. P. (2015). Longitudinal study of acculturation and BMI change among Asian American men. *Preventive Medicine*, *73*, 15-21.
- O'Connor, R. C., Rasmussen, S., & Hawton, K. (2010). Predicting depression, anxiety and self-harm in adolescents: The role of perfectionism and acute life stress. *Behaviour Research and Therapy*, *48*(1), 52-59.
- Pacht, A. R. (1984). Reflections on perfection. *American Psychologist*, *39*(4), 386.
- Pearson, C. A., & Gleaves, D. H. (2006). The multiple dimensions of perfectionism and their relation with eating disorder features. *Personality and Individual Differences*, *41*(2), 225-235.

- Pearce, J. M. S. (2004). Richard Morton: origins of anorexia nervosa. *European Neurology*, 52(4), 191-192.
- Pike, K. M., Hoek, H. W., & Dunne, P. E. (2014). Cultural trends and eating disorders. *Current Opinion in Psychiatry*, 27(6), 436-442.
- Popkin, B. M., & Udry, J. R. (1998). Adolescent obesity increases significantly in second and third generation US immigrants: the National Longitudinal Study of Adolescent Health. *The Journal of Nutrition*, 128(4), 701-706.
- Quick, V. M., & Byrd-Bredbenner, C. (2014). Disordered eating, socio-cultural media influencers, body image, and psychological factors among a racially/ethnically diverse population of college women. *Eating Behaviors*, 15(1), 37-41.
- Quick, V. M., Byrd-Bredbenner, C., & Neumark-Sztainer, D. (2013). Chronic illness and disordered eating: a discussion of the literature. *Advances in Nutrition: An International Review Journal*, 4(3), 277-286.
- Quick, V. M., McWilliams, R., & Byrd-Bredbenner, C. (2012). Case-control study of disturbed eating behaviors and related psychographic characteristics in young adults with and without diet-related chronic health conditions. *Eating Behaviors*, 13(3), 207-213.
- Ramanathan, V. (2015). Values, Behaviour and Identity: Acculturation of Indian Immigrant Men in Australia. *Journal of International Migration and Integration*, 16(3), 625-638.
- Redfield, R., Linton, R., & Herskovits, M. J. (1936). Memorandum for the study of acculturation. *American Anthropologist*, 38(1), 149-152.
- Regan, P. C., & Cachelin, F. M. (2006). Binge eating and purging in a multi-ethnic community sample. *International Journal of Eating Disorders*, 39(6), 523-526.
- Rice, K. G., Ray, M. E., Davis, D. E., DeBlaere, C., & Ashby, J. S. (2015). Perfectionism and longitudinal patterns of stress for STEM majors: Implications for academic performance. *Journal of Counseling Psychology*, 62(4), 718.
- Rich, S. S., & Thomas, C. R. (2008). Body mass index, disordered eating behavior, and acquisition of health information: Examining ethnicity and weight-related issues in a college population. *Journal of American College Health*, 56(6), 623-628.
- Rotella, F., Fioravanti, G., Godini, L., Mannucci, E., Faravelli, C., & Ricca, V. (2015). Temperament and emotional eating: A crucial relationship in eating disorders. *Psychiatry Research*, 225(3), 452-457.
- Rotella, F., Fioravanti, G., & Ricca, V. (2016). Temperament and personality in eating disorders. *Current opinion in Psychiatry*, 29(1), 77-83.
- Ruderman, A. J., & Christensen, H. (1983). Restraint theory and its applicability to overweight individuals. *Journal of Abnormal Psychology*, 92(2), 210.
- Serafica, R. C. (2014). Dietary acculturation in Asian Americans. *Journal of Cultural Diversity*, 21(4).
- Shin, K. R., & Features Submission, H. C. (1994). Psychosocial predictors of depressive symptoms in Korean-American women in New York City. *Women & Health*, 21(1), 73-82.

- Slade, P. (1982). Towards a functional analysis of anorexia nervosa and bulimia nervosa. *British Journal of Clinical Psychology*, 21(3), 167-179.
- Slade, P. D., & Owens, R. G. (1998). A dual process model of perfectionism based on reinforcement theory. *Behavior Modification*, 22(3), 372-390.
- Smolak, L., & Murnen, S. K. (2001). Gender and eating problems.
- Stoeber, J., & Otto, K. (2006). Positive conceptions of perfectionism: Approaches, evidence, challenges. *Personality and Social Psychology Review*, 10(4), 295-319.
- Striegel-Moore, R. H., & Bulik, C. M. (2007). Risk factors for eating disorders. *American Psychologist*, 62(3), 181.
- Suinn, R. M. (2010). Reviewing acculturation and Asian Americans: How acculturation affects health, adjustment, school achievement, and counseling. *Asian American Journal of Psychology*, 1(1), 5.
- Suinn, R. M., Ahuna, C., & Khoo, G. (1992). The Suinn-Lew Asian self-identity acculturation scale: Concurrent and factorial validation. *Educational and Psychological Measurement*, 52(4), 1041-1046.
- Suinn, R. M., Rickard-Figueroa, K., Lew, S., & Vigil, P. (1987). The Suinn-Lew Asian self-identity acculturation scale: An initial report. *Educational and Psychological Measurement*, 47(2), 401-407.
- Sussman, N. M., Truong, N., & Lim, J. (2007). Who experiences "America the beautiful"? Ethnicity moderating the effect of acculturation on body image and risks for eating disorders among immigrant women. *International Journal of Intercultural Relations*, 31(1), 29-49.
- Sundquist, J., & Winkleby, M. (2000). Country of birth, acculturation status and abdominal obesity in a national sample of Mexican-American women and men. *International Journal of Epidemiology*, 29(3), 470-477.
- Stice, E., Fisher, M., & Lowe, M. R. (2004). Are dietary restraint scales valid measures of acute dietary restriction? Unobtrusive observational data suggest not. *Psychological Assessment*, 16(1), 51.
- Stunkard, A. J., & Messick, S. (1985). The three-factor eating questionnaire to measure dietary restraint, disinhibition and hunger. *Journal of Psychosomatic Research*, 29(1), 71-83.
- Taylor, J. J., Papay, K. A., Webb, J. B., & Reeve, C. L. (2016). The good, the bad, and the interactive: Evaluative concerns perfectionism moderates the effect of personal strivings perfectionism on self-esteem. *Personality and Individual Differences*, 95, 1-5.
- Tong, Y. (2013). Acculturation, gender disparity, and the sexual behavior of Asian American youth. *Journal of Sex Research*, 50(6), 560-573.
- Tuschl, R. J. (1990). From dietary restraint to binge eating: some theoretical considerations. *Appetite*, 14(2), 105-109.
- Van Strien, T., Frijters, J. E., Bergers, G., & Defares, P. B. (1986). The Dutch Eating Behavior Questionnaire (DEBQ) for assessment of restrained, emotional, and external eating behavior. *International Journal of Eating Disorders*, 5(2), 295-315.

- Venkatesh, S., Weatherspoon, L. J., Kaplowitz, S. A., & Song, W. O. (2013). Acculturation and glycemic control of Asian Indian adults with type 2 diabetes. *Journal of Community Health*, 38(1), 78-85.
- Vitousek, K. M., & Stumpf, R. E. (2004). Difficulties in the assessment of personality traits and disorders in eating-disordered individuals. *Eating Disorders*, 13(1), 37-60.
- Weinstock, S. A. (1966). A note on the value of structural explanations in the study of acculturation. *The British Journal of Sociology*, 17(1), 60-63.
- Westenhoefer, J., Stunkard, A. J., & Pudel, V. (1999). Validation of the flexible and rigid control dimensions of dietary restraint. *International Journal of Eating Disorders*, 26(1), 53-64.
- Yeomans, M. R., & McCrickerd, K. (2017). Acute hunger modifies responses on the Three Factor Eating Questionnaire hunger and disinhibition, but not restraint, scales. *Appetite*, 110, 1-5.
- Young, E. A., Clopton, J. R., & Bleckley, M. K. (2004). Perfectionism, low self-esteem, and family factors as predictors of bulimic behavior. *Eating Behaviors*, 5(4), 273-283.
- Zeiler, M., Waldherr, K., Philipp, J., Nitsch, M., Dür, W., Karwautz, A., & Wagner, G. (2016). Prevalence of Eating Disorder Risk and Associations with Health-related Quality of Life: Results from a Large School-based Population Screening. *European Eating Disorders Review*, 24(1), 9-18.

## Appendix A



# ***Personal Traits and Eating Behaviors Study***

This is a study investigating the relationship between personal traits and eating behaviors among Asian-American students.

You are invited to participate in our study if you are



- *a current Rutgers student*
- *18 to 60 years old*
- *a self-identified Asian or descended from Asian, e.g., Chinese, Japanese, Korean, Indian, Filipino, Vietnamese, etc.*

As a participant for this study, you will be asked to complete an **online questionnaire** which should take you only 15 minutes.

In appreciation of your time, you will be able to enter a raffle for a **\$15 Starbucks gift card**.

**Your personal information will be treated in complete confidence.**

To volunteer for this study, please contact Qing at **732-320-3245** or

**[EatingDisorderRU@gmail.com](mailto:EatingDisorderRU@gmail.com)**



## Appendix B

### **CONSENT FORM** **FOR PERSONAL TRAITS AND EATING BEHAVIORS DATA COLLECTION**

You are invited to complete this questionnaire as part of a research study to understand the relationship between personal traits and eating behaviors conducted by Qing Chen, who is a graduate student in the Department of Nutritional Sciences at Rutgers University, and supervised by John Worobey, Professor in the Department of Nutritional Sciences.

The research team and the Institutional Review Board at Rutgers University are the only parties that will be allowed to see the data, except as may be required by law. If a report of this study is published, or the results are presented at a professional conference, only group results will be stated. Group results will be made available to participants if requested. All study data will be kept for five years.

This research is confidential and your participation is voluntary. You may choose not to participate, and you may withdraw at any time during the study procedures without any penalty to you.

If you have any questions about the study or study procedures, you may contact Qing Chen at [qc52@scarletmail.rutgers.edu](mailto:qc52@scarletmail.rutgers.edu), 732-320-3245. You can also contact my faculty advisor Dr. John Worobey, at [worobey@rci.rutgers.edu](mailto:worobey@rci.rutgers.edu), 732-932-6517, 26 Nichol Ave, New Brunswick, NJ 08901.

If you have any questions about your rights as a research subject, please contact an IRB Administrator at the Rutgers University, Arts and Sciences IRB:

Institutional Review Board

Rutgers University, the State University of New Jersey

Liberty Plaza / Suite 3200

335 George Street, 3<sup>rd</sup> Floor

New Brunswick, NJ 08901

Phone: 732-235-9806

Email: [humansubjects@orsp.rutgers.edu](mailto:humansubjects@orsp.rutgers.edu)

Please retain a copy of this form for your records. By participating in the above stated procedures, then you agree to participation in this study.

You will be able to get into our raffle system for a \$15 Starbucks eGift Card by taking this survey before 11/23/2016 (please see the end of the survey).

If you are **18 years of age or older**, understand the statements above, and will consent to participate in the study, click on the "I Agree" button to begin the survey/experiment. If not, please click on the "I Do Not Agree" button which you will exit this program.

I Agree

I Do Not Agree

## Appendix C

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### Welcome

You are invited to complete this questionnaire as part of a research study to understand the relationship between personal traits and eating behaviors conducted by Qing Chen, who is a graduate student in the Department of Nutritional Sciences at Rutgers University, and supervised by John Worobey, Professor in the Department of Nutritional Sciences.

The research team and the Institutional Review Board at Rutgers University are the only parties that will be allowed to see the data, except as may be required by law. If a report of this study is published, or the results are presented at a professional conference, only group results will be stated. Group results will be made available to participants if requested. All study data will be kept for five years.

This research is confidential and your participation is voluntary. You may choose not to participate, and you may withdraw at any time during the study procedures without any penalty to you.

If you have any questions about the study or study procedures, you may contact Qing Chen at [qc52@scarletmail.rutgers.edu](mailto:qc52@scarletmail.rutgers.edu), 732-320-3245. You can also contact my faculty advisor Dr. John Worobey, at [worobey@rci.rutgers.edu](mailto:worobey@rci.rutgers.edu), 732-932-6517, 26 Nichol Ave, New Brunswick, NJ 08901.

If you have any questions about your rights as a research subject, please contact an IRB Administrator at the Rutgers University, Arts and Sciences IRB:  
Institutional Review Board  
Rutgers University, the State University of New Jersey  
Liberty Plaza / Suite 3200  
335 George Street, 3<sup>rd</sup> Floor  
New Brunswick, NJ 08901  
Phone: 732-235-9806  
Email: [humansubjects@orsp.rutgers.edu](mailto:humansubjects@orsp.rutgers.edu)

Please retain a copy of this form for your records. By participating in the above stated procedures, then you agree to participation in this study.

You will be able to get into our raffles system for a \$15 Starbucks eGift Card by taking this survey **before 11/23/2016** (please see the end of the survey).

If you are **18 years of age or older**, understand the statements above, and will consent to participate in the study, click on the "I Agree" button to begin the survey/experiment. If not, please click on the "I Do Not Agree" button which you will exit this program.

I Agree

☐

I Do Not Agree

☐

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### Section I

Welcome to our survey.

The purpose of this survey is to help us to learn more about the relation of eating behaviors, self-awareness and other concerns among Asian-American students. The entire survey should take you no more than 15 minutes to complete. Your participation is voluntary and you may stop at anytime without penalty. All of your responses are confidential. Thank you for your time and assistance.

1. Please indicate your gender.

- ☐ Male  
☐ Female  
☐ Other

2. Please indicate your age group.

- ☐ 18-24  
☐ 25-29  
☐ 30-34  
☐ 35-39  
☐ 40-60  
☐ I prefer not to answer

3. Please indicate your major (Please write down the full name) .

4. Please indicate your GPA range.

- ☐ 3.500 - 4.000
- ☐ 3.000 - 3.499
- ☐ 2.500 - 2.999
- ☐ 2.000 - 2.499
- ☐ < 2.000
- ☐ I prefer not to answer

5. What is your height?

- ☐ I prefer to answer my height in feet and inches
- ☐ I prefer to answer my height in centimeters

Please enter your height in feet and inches

	Feet	Inches
Height	<input type="text"/>	<input type="text"/>

Please type your height in centimeters (no units needed)

6. What is your weight (no units needed)?

- ☐ Pounds
- ☐ Kilograms

## Section II

The questions below are for the purpose of collecting information about your historical background as well as more recent behaviors which may relate to your cultural identity. Please choose the one response that best describes you and do not leave any items blank.

1. What language can you speak?

- ☐ Asian only (for example, Chinese, Japanese, Korean, Vietnamese, etc.)
- ☐ Mostly Asian, some English
- ☐ Asian and English about equally well (bilingual)
- ☐ Mostly English, some Asian
- ☐ Only English
- ☐ Other

2. What language do you prefer?

- ☐ Asian only (for example, Chinese, Japanese, Korean, Vietnamese, etc.)
- ☐ Mostly Asian, some English
- ☐ Asian and English about equally well (bilingual)
- ☐ Mostly English, some Asian
- ☐ Only English

## 3. How do you identify yourself?

- ☐ Oriental
- ☐ Asian
- ☐ Asian-American
- ☐ Chinese-American, Japanese-American, Korean-American, etc
- ☐ American
- ☐ Other

## 4. Which identification does (did) your mother use?

- ☐ Oriental
- ☐ Asian
- ☐ Asian-American
- ☐ Chinese-American, Japanese-American, Korean-American, etc
- ☐ American
- ☐ Other

## 5. What identification does (did) your father use?

- ☐ Oriental
- ☐ Asian
- ☐ Asian-American
- ☐ Chinese-American, Japanese-American, Korean-American, etc
- ☐ American
- ☐ Other

## 6. What was the ethnic origin of the friends and peers you had, as a child up to age 6?

- ☐ Almost exclusively Asians, Asian-Americans, Orientals
- ☐ Mostly Asians, Asian-Americans, Orientals
- ☐ About equally Asian groups and Anglo groups
- ☐ Mostly Anglos, Blacks, Hispanics, or other non-Asian ethnic groups
- ☐ Almost exclusively Anglos, Blacks, Hispanics, or other non-Asian ethnic groups
- ☐ Other

## 7. What was the ethnic origin of the friends and peers you had, as a child from age 6 to 18?

- ☐ Almost exclusively Asians, Asian-Americans, Orientals
- ☐ Mostly Asians, Asian-Americans, Orientals
- ☐ About equally Asian groups and Anglo groups
- ☐ Mostly Anglos, Blacks, Hispanics, or other non-Asian ethnic groups
- ☐ Almost exclusively Anglos, Blacks, Hispanics, or other non-Asian ethnic groups
- ☐ Other

## 8. Whom do you now associate with in the community?

- ☐ Almost exclusively Asians, Asian-Americans, Orientals
- ☐ Mostly Asians, Asian-Americans, Orientals
- ☐ About equally Asian groups and Anglo groups
- ☐ Mostly Anglos, Blacks, Hispanics, or other non-Asian ethnic groups
- ☐ Almost exclusively Anglos, Blacks, Hispanics, or other non-Asian ethnic groups
- ☐ Other

9. If you could pick, whom would you prefer to associate with in the community?

- ☐ Almost exclusively Asians, Asian-Americans, Orientals
- ☐ Mostly Asians, Asian-Americans, Orientals
- ☐ About equally Asian groups and Anglo groups
- ☐ Mostly Anglos, Blacks, Hispanics, or other non-Asian ethnic groups
- ☐ Almost exclusively Anglos, Blacks, Hispanics, or other non-Asian ethnic groups
- ☐ Other

10. What is your music preference?

- ☐ Only Asian music, (for example, Chinese, Japanese, Korean, Vietnamese, etc)
- ☐ Mostly Asian
- ☐ Equally Asian and English
- ☐ Mostly English
- ☐ Only English
- ☐ Other

11. What is your movie preference?

- ☐ Asian-language movies only
- ☐ Asian-language movies mostly
- ☐ Equally Asian/English-language movies
- ☐ Mostly English-language movies only
- ☐ English-language movies only
- ☐ Other

12. What generation are you? (choose the generation that best applies to you:)

- ☐ 1st Generation = I was born in Asia or country other than U.S.
- ☐ 2nd Generation = I was born in U.S., either parent was born in Asia or country other than U.S.
- ☐ 3rd Generation = I was born in U.S., both parents were born in U.S, and all grandparents born in Asian or country other than U.S.
- ☐ 4th Generation = I was born in U.S., both parents were born in U.S, and at least one grandparent born in Asia or country other than U.S. and one grandparent born in U.S.
- ☐ 5th Generation = I was born in U.S., both parents were born in U.S., and all grandparents also born in U.S.
- ☐ Don't know what generation best fits since I lack some information

13. Where were you raised?

- ☐ In Asia only
- ☐ Mostly in Asia, some in U.S.
- ☐ Equally in Asia and U.S.
- ☐ Mostly in U.S., some in Asian
- ☐ In U.S. only
- ☐ Other

14. What contact have you had with Asia?

- ☐ Raised one year or more in Asia
- ☐ Lived for less than one year in Asia
- ☐ Occasional visits to Asia
- ☐ Occasional communications (letters, phone, calls, etc.) with people in Asia
- ☐ No exposure or communications with people in Asia

15. What is your food preference at home?

- ☐ Exclusively Asian food
- ☐ Mostly Asian food, some American
- ☐ About equally Asian and American
- ☐ Mostly American food
- ☐ Exclusively American food
- ☐ Other

16. What is your food preference in restaurant?

- ☐ Exclusively Asian food
- ☐ Mostly Asian food, some American
- ☐ About equally Asian and American
- ☐ Mostly American food
- ☐ Exclusively American food
- ☐ Other

17. Do you?

- ☐ Read only an Asian language?
- ☐ Read an Asian language better than English?
- ☐ Read both Asian and English equally well?
- ☐ Read English better than an Asian language?
- ☐ Read only English?

18. Do you?

- ☐ Write only an Asian language?
- ☐ Write an Asian language better than English?
- ☐ Write both Asian and English equally well?
- ☐ Write English better than an Asian language?
- ☐ Write only English?

19. If you consider yourself a member of the Asian group (Oriental, Asian, Asian-American, Chinese-American, etc., whatever term you prefer), how much pride do you have in this group?

- ☐ Extremely proud
- ☐ Moderately proud
- ☐ Little pride
- ☐ No pride but do not feel negative toward group
- ☐ No pride but do feel negative toward group

20. How would you rate yourself?

- ☐ Very Asian
- ☐ Mostly Asian
- ☐ Bicultural
- ☐ Mostly Westernized
- ☐ Very Westernized
- ☐ Other

21. Do you participate in Asian occasion, holidays, traditions, etc.?

- ☐ Nearly all  
☐ Most of them  
☐ Some of them  
☐ A few of them  
☐ None at all

### Section III

The questions below are for the purpose of collecting information about your self-awareness as well as behaviors which may relate to your personal standards. Please choose the one response that best describes you and do not leave any items blank.

Rate each of the following statements on a scale of 1 ("Strongly agree") to 5 ("Strongly disagree").

	Strongly agree	Somewhat agree	Neither agree nor disagree	Somewhat disagree	Strongly disagree
1. My parents set very high standards for me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Organization is very important to me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. As a child, I was punished for doing things less than perfect.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. If I do not set the highest standards for myself, I am likely to end up a second-rate person.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. My parents never tried to understand my mistakes.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. It is important to me that I be thoroughly competent in everything I do.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
7. I am a neat person.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. I try to be an organized person.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. If I fail at work/school, I am a failure as a person.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. I should be upset if I make a mistake.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. My parents wanted me to be the best at everything.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. I set higher goals than most people.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. If someone does a task at work/school better than I, then I feel like I failed the whole task.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. If I fail partly, it is as bad as being a complete failure.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. Only outstanding performance is good enough in my family.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. I am very good at focusing my efforts on attaining a goal.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17. Even when I do something very carefully, I often feel that it is not quite right.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
18. I hate being less than the best at things.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
19. I have extremely high goals.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
20. My parents have expected excellence from me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
21. People will probably think less of me if I make a mistake.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
22. I never felt like I could meet my parents' expectations.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
23. If I do not do as well as other people, it means I am an inferior human being.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
24. Other people seem to accept lower standards from themselves than I do.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
25. If I do not do well all the time, people will not respect me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
26. My parents have always had higher expectations for my future than I have.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
27. I try to be a neat person.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
28. I usually have doubts about the simple everyday things I do.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
29. Neatness is very important to me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
30. I expect higher performance in my daily tasks than most people.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
31. I am an organized person.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
32. I tend to get behind in my work because I repeat things over and over.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
33. It takes me a long time to do something "right."	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
34. The fewer mistakes I make, the more people will like me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
35. I never felt like I could meet my parents' standards.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The questions below are for the purpose of collecting information about your eating behaviors. . Please choose the one response that best describes you and do not leave any items blank.

Rate each of the following statements on a scale of 1 ("Definitely true") to 5 ("Definitely false").

	Definitely true	Mostly true	Neither true nor false	Mostly false	Definitely false
1. When I smell a sizzling steak or juicy piece of meat, I find it very difficult to keep from eating, even if I have just finished a meal.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. I deliberately take small helpings as a means of controlling my weight.	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
3. When I feel anxious, I find myself eating.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Sometimes when I start eating, I just can't seem to stop.	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
5. Being with someone who is eating often makes me hungry enough to eat also.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. When I feel blue, I often overeat.	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
7. When I see a real delicacy, I often get so hungry that I have to eat right away.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. I get so hungry that my stomach often seems like a bottomless pit.	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
9. I am always hungry so it is hard for me to stop eating before I finish the food on my plate.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. When I feel lonely, I console myself by eating.	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
11. I consciously hold back at meals in order not to weight gain.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. I do not eat some foods because they make me fat.	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>	<input checked="" type="radio"/>
13. I am always hungry enough to eat at any time.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Rate each of the following statement on a scale of 1 ("Only at meal times") to 5 ("Almost always").

	Only at meal times	Sometimes between meals	Once in a while	Often between meals	Almost always
14. How often do you feel hungry?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Rate each of the following statement on a scale of 1 ("Almost never") to 5 ("Almost always").

	Almost never	Seldom	Sometimes	Usually	Almost always
15. How frequently do you avoid “stocking up” on tempting foods?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Rate each of the following statement on a scale of 1 ("Unlikely") to 5 ("Very likely").

	Unlikely	Slightly likely	Neutral likely	Moderately likely	Very likely
16. How likely are you to consciously eat less than you want?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Rate each of the following statement on a scale of 1 ("Never") to 5 ("At least once a week").

	Never	Rarely	Once in a while	Sometimes	At least once a week
17. Do you go on eating binges though you are not hungry?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

On a scale of 1 to 8, where 1 means no restraint in eating (eating whatever you want, whenever you want it) and 8 means total restraint (constantly limiting food intake and never "giving in"), what number would you give yourself?

1 2 3 4 5 6 7 8



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**Final**

Are there any questions/concerns you have for this survey? If yes, please specify below:

In order to get you into our raffle for a \$15 Starbucks Gift Card, please enter your email below: