

Associations Among Self-Compassion, Stress, and Eating Behavior  
in College Freshmen

by

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A Thesis Presented in Partial Fulfillment  
of the Requirements for the Degree  
Master of Science

Approved April 2013 by the  
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ARIZONA STATE UNIVERSITY

May 2013

## ABSTRACT

In the past decade, research has demonstrated the relationship between higher levels of self-compassion and lower levels of negative psychological outcomes. More recently, the concept of self-compassion has been explored within the context of various health behaviors. Very few studies have investigated the potential relationship between self-compassion and eating behaviors. Based on literature and the established relationship between negative self-evaluation and abnormal eating behaviors/eating disorders, the current study sought to examine correlations between self-compassion, eating behaviors, and stress in first time college freshmen.

The study population consisted of 1478 participants; ages 18-22 years; females = 936 (63%), males = 541 (37%). Participants self-reported measures of the Perceived Stress Scale (PSS), the Three Factor Eating Questionnaire (TFEQ), and the Self Compassion Scale (SCS). PSS score, the overall score and individual subscale scores of SCS, and the three subscale scores of the TFEQ (restraint, disinhibition, hunger) were examined with Pearson correlations.

Results of this study indicate significant ( $p < .05$ ) differences between males and females in PSS and all three negative SCS subscales. There was a strong and consistent correlation between the eating behavior of disinhibition and all three negative constructs of self-compassion (self-judgment,  $r = .29$ ; isolation,  $r = .23$ ; over-identification,  $r = .28$ ) in females. The eating behavior of restraint was similarly correlated with SCS self-judgment in females ( $r = .26$ ). More research is needed to understand differences in stress, self-compassion, and eating behaviors between males

and females and to better comprehend the weak associations between eating behaviors and the positive psychological constructs of self-compassion (self-kindness, common humanity, and mindfulness) for males and females. Additionally, future research should focus on the three subscales of disinhibition as they relate to the negative constructs of self-compassion. The preliminary results of this study suggest it would be beneficial, particularly to female college freshmen, to more fully understand the dynamics of the relationship between eating behaviors and self-compassion; this knowledge may help to better structure appropriate coping strategies for the prevention of disordered eating behaviors.

## DEDICATION

In deep gratitude and dedication to the two most important people in my life- my children, Jack and Stella. Your love, support, and tolerance on this journey have been immeasurable. You've been understanding of challenging circumstances and have had immense patience and the best of attitudes. Your belief in me accomplishing this goal has been a constant source of motivation and inspiration. You've helped me maintain a balance and perspective that may have otherwise been lost. I never could have asked for more sincerity and excitement with each celebratory milestone, I'm so grateful we got to share these moments together! Thank you Jack and Stella for being exactly who you are.

To Dr. Ann Sebren, simply without whom, none of this would have been possible. Thank you for sharing your research, passions, knowledge, and wisdom. Your time, guidance, and encouragement have been immense gifts from which I have learned how to write more strongly, think more clearly, and trust more deeply. Most importantly, thank you for the invitation to research and discover the infinite and necessary gift of self-compassion. I'm grateful for the time that we've had together and know it will help shape my journey as a student, researcher, and teacher. Lastly, thank you for reminding me to breathe at the most essential moments!

## ACKNOWLEDGMENTS

I want to acknowledge and thank all of the people who have been foundational to the accomplishment of this academic and personal endeavor. Thank you to my committee- Dr. Ann Sebren, Dr. Pamela Swan, and Dr. Cheryl Der Ananian- your expertise and guidance have brought me this far and are greatly appreciated. Thank you for walking me through each step of this process and taking the time to teach me what I needed to know; I can truly say it has been a pleasure and an honor. Thank you to Dr. Swan for sharing your extensive knowledge of the research process, exploring many avenues with this project, and your artistic drawings that helped me think conceptually! Thank you to Dr. Der Ananian for generously giving so much time to helping me with the language and understanding of statistics and results.

A huge thank you to Theresa Araas and Laura Rooney who first collected this data in 2007. I've been fortunate to have their work and writings guide me through this academic experience.

I want to thank Julie Rice and Sue Callahan for their ongoing assistance with the small details that make a huge difference. Thank you to my undergraduate advisor, Dr. Lehnhard for directing me to ASU and to places beyond where I'd been. Thank you to Dr. Phillips for supporting my interests and teaching me how to think like a researcher. To my friends at ASU- Taylor Cushman, Sean Preuss, Kate Malone- I never would have made it through my first year without you all, thank you. Sarah Wherry, thank you for answering every question I ever needed to know, you have been a huge resource to me!

Thank you to Jenelle Walker for welcoming me to join her in research during my first year- the exposure and experience I gained were invaluable.

Thank you to Bryan Bachman and Susan Radmacher for taking such good care of my children and always being willing to help. To Karl Brunner and Robin Barstow for always believing in me, even when I didn't. Your sincerity and support have been invaluable gifts of our deep friendships. To Emily and Erika for always being there for me over the years, through the good and bad, even from across the country.

Thank you to my parents for all of your love and support. Thank you Mom for the inspiration to move to Arizona and for being such an incredible role model for the continuous journey of learning and the passion of growing. Thank you to my sisters and cousin- Amanda, Sarah, Carlie, and Hilary- you have always been my closest friends, my strongest source of support, and the ones I can call anytime- I am grateful for you all every day. To my grandmother who has always been enthusiastic and genuinely interested in my work and has always believed in my abilities to achieve my goals. Much love, appreciation, and gratitude to all my friends and family who have helped make this possible!

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## Chapter 1

The transition into college presents young adults with opportunities for educational growth, personal maturation, and professional development, while at the same time creating significant psychological stress (Sasaki & Yamasaki, 2007). This sensitive and demanding period is a time that presents new stressors, environmental changes, behavioral adaptations, unfamiliar situations, and academic pressures that challenge students' overall well-being (Dyson & Renk, 2006; Neely, Schallert, Mohammed, Roberts & Chen, 2009; Sasaki & Yamasaki, 2007). Research has demonstrated that the stressful transitional period into college places students at risk for disordered eating, clinical eating disorders, the development of weight related issues (Delinsky & Wilson, 2008; Freeman & Gil, 2003; Wolff, Crosby, Roberts & Wittrocks, 2000), and challenged psychological well-being (Berzonsky & Kuk, 2000; Dyson & Renk, 2006). It has been clearly established that in response to stress, eating behaviors are associated with both an increase and decrease in food consumption (Oliver & Wardle, 1999; Torres & Nowson, 2007). Stress, as it is experienced among the college population, has been linked to symptoms of bingeing (Roberti, Harrington, & Storch, 2006), bingeing and purging, and restraint (Berg, Frazier, & Sherr, 2009). While the behavior of over-consumption of food may lead to obesity (Torres & Nowson, 2007), the behaviors of restraint and bingeing/purging may lead to anorexia or bulimia (Berg et al., 2009; Roberti et al., 2006). The developed coping mechanism of abnormal eating can potentially have enduring significance on health behaviors in response to stress (Bray & Born, 2004). Research has established that the eating behaviors formed during this critical time period could initiate

and contribute to weight struggles and weight problems over the lifespan (Cluskey & Grobe, 2009).

While research has established a clear association between elevated levels of stress and symptoms of disordered eating in college students, there are no studies that explore the relationships among levels of stress, levels of self-compassion and eating behaviors. The concept of self-compassion embraces the constructs of self-kindness, mindfulness, and common humanity (Neff, Kirkpatrick, & Rude, 2007). Self-compassion has been shown to improve one's ability to respond in an a more effective manner to various situations (Samaie & Farahanit, 2011). Gilbert (2005) proposes that self-compassion deactivates the threat system associated with stress and, in fact, activates the self-soothing system. The qualities of self-compassion are believed to create increased possibility for effective and successful coping with stress and thus may have an important influence on stress related eating behavior (Gilbert, 2005).

An experimental study done by Adams & Leary (2007) explored the effects of a self-compassion induction on eating in college students. Among restrictive eaters, self-compassion reduced self-criticism and attenuated eating after an unhealthy food preload. While self-compassion is a relatively new concept, Adams and Leary (2007) suggest that self-compassion may help restrictive eaters learn how to eat in a more balanced and healthy way. Restrictive eaters with greater self-compassion may learn to respond to stress and negative thoughts with more adaptive means of coping. Greater awareness brought about by self-compassion may help restrictive eaters avoid self-judgment, develop positive coping skills and improve their behavior of self-regulation with regards to eating.

Although there is a strong body of research to support the psychological benefits of self-compassion, far less work has concentrated on the role that self-compassion may play in health behaviors such as eating. Given the impact that abnormal eating can potentially have on students' health, both during the transition into college and throughout their lifespan, and the potential role that self-compassion may play in reducing the risk of abnormal eating during the college transition, it is important to more clearly understand these complex dynamics to better support student psychological well-being and behavioral responses to stress.

### **Purpose, Aims, and Hypotheses**

The purpose of this study was to examine the relationships among the constructs of self-compassion (self-kindness, mindfulness, common humanity, self-judgment, perceived isolation, over-identification), perceived stress, and the constructs of eating behaviors (hunger, disinhibition, and restraint) in first time college freshmen. This study was a secondary analysis of previously collected survey data using a cross sectional study design.

**Aim #1:** To determine the association between overall self-compassion and eating behavior scores in first time college freshmen.

*Hypothesis 1:* There will be a negative association between overall levels of self-compassion and each of the 3 eating behavior constructs (restrained, disinhibition, and hunger) among the total study population.

*Hypothesis 2:* There will be a negative association between overall levels of self-compassion and each of the 3 eating behavior constructs (restrained, disinhibition, and hunger) in both females and males.

**Aim #2:** To determine associations among the specific constructs of self-compassion (3 positive constructs, 3 negative constructs) and the constructs of eating behaviors (3 constructs) in first time college freshmen.

*Hypothesis 1:* There will be negative associations between the 3 positive psychological constructs of self-compassion and the 3 constructs of eating behaviors in the study population as a whole and as separated by females and males.

*Hypothesis 2:* There will be positive associations between the 3 negative psychological constructs of self-compassion and the 3 constructs of eating behaviors in the study population as a whole and as separated by females and males.

**Aim #3:** To determine the association between overall stress and overall self-compassion scores in first time college freshmen.

*Hypothesis 1:* There will be a negative association between overall stress scores and overall self-compassion scores in the total study population.

*Hypothesis 2:* There will be a negative association between overall stress scores and overall self-compassion scores in females and males.

**Aim #4:** To determine the association between overall stress and eating behaviors in first time college freshmen.

*Hypothesis 1:* There will be a positive association between overall stress scores and each of the 3 eating behavior constructs in the total study population.

*Hypothesis 2:* There will be a positive association between overall stress scores and each of the 3 eating behavior constructs in men and women.

### **Definition of Terms:**

1. Stress: “ The generalized, non-specific response of the body to any factor that overwhelms, or threatens to overwhelm, the body’s compensatory abilities to maintain homeostasis or psychological well-being” (Torres & Nowson, 2007, p. 887).
2. Perceived Stress Scale (PSS): a subjective self-report scale measuring one’s perceived degree of situational stress.
3. Eating behaviors: The specific constructs of restraint, disinhibition, and hunger as outlined by the Three-Factor Eating Questionnaire (Stunkard & Messick, 1985).
4. Three-Factor Eating Questionnaire (TFEQ): a subjective self-report scale used to quantify the eating behaviors of restraint, disinhibition, and hunger.
5. Self-Compassion: The concept involving being caring and compassionate towards oneself based on the fundamental constructs of self-kindness, common humanity, and mindfulness.
6. Self-Compassion Scale (SCS): a subjective self-report scale used to measure one’s level of self-compassion as assessed through the constructs of self-kindness, common humanity, mindfulness, self-judgment, perceived isolation, and over-identification.
7. Transitional period: The marked period of transitional entrance into the freshmen year of college.

**Delimitations and Limitations:**

The study was conducted as a secondary analysis of data collected in 2007.

Inclusionary criteria for this study were as follows: all participants, both males and females, were first year, first time incoming freshmen (part and full time) from a large metropolitan Southwestern university. The primary limitations of this study are that all the given questionnaires are self-report measures and were collected one time from one Southwestern university; therefore, the results may not be generalizable to a broader population.



## Chapter 2

### Review Of Literature

#### University Transition

The transition from high school to college is considered a “ complex phenomenon” (Bray & Born, 2004, p. 181) and a “ major life transition” (Berzonsky & Kuk, 2000, p. 81). This specific time period is typically considered to be the transition from high school into college and throughout the first year of college (Dyson & Renk, 2006; Bray & Born, 2004). The transition often requires changes in living status, social networks and adjustment to a new academic setting (Pittman & Richmond, 2008). This time period disrupts routines and habits that have likely been established for years; disruption of the environment and home can create insecurity and a loss of identity (Bray & Born, 2004). During this time, students are also seen as transitioning from adolescence to adulthood and are taking on many new roles as they live independently, start to support themselves financially, further their education and begin to enter a field of work (Dyson & Renk, 2006). Researchers have established that while starting college is a time of great developmental and educational growth, the combination of new responsibilities, unfamiliar situations and academic pressures cause college freshmen to be particularly vulnerable to “serious psychological distress” (Sasaki & Yamasaki, 2007, p. 51; Zaleski, Levey-Thors, & Schiaffino, 1998).

While it is well known that that the transition into college creates a period of high stress, what is less well known is the impact this period has as the student matures into an adult and later on in life. Researchers state that health related behaviors established during this time “ may have a significant impact on health behaviours and the occurrence of

diseases later in life” (Von Ah, Ebert, Ngamvitroj, Park, & Kang, 2004, p. 472). To further explore this idea, Von Ah et al (2004), utilized the Health Belief Model to assess the associated susceptibility, severity, benefits and barriers in relation to stress and health related behaviors in college freshmen. This was conducted as a cross sectional study at a southern university with a sample size of 161 students. Participants were both female (118) and male (43), with a mean age of 19.7 years old, all students were incoming freshmen. Instruments used for this study were self-report questionnaires for stress and health related behaviors. The Perceived Stress Scale (PSS) was used to measure student’s stress level. To measure health behaviors, the researchers developed a 46- item Health Behavior Questionnaire (specifically for this study). Additionally, they used a 102- item Health Belief Model questionnaire, addressing susceptibility, severity, benefits and barriers. Although the HBM questionnaire was based on literature, it is important to note that it was designed specifically for this study.

The results of this study showed significant levels ( $p = .0001$ ) of stress associated with the transitional period and maladaptive health behaviors such as smoking, alcohol consumption, low rates of exercise and unhealthy dietary practices. There are limitations to this study such as questionnaires were self-report and two of the three questionnaires were designed specifically for this study, and were therefore not validated. However; the researchers postulate that the maladaptive behaviors established during this time period could have an exceptional impact on the health behaviors and associated diseases later on in life (Von Ah et al., 2004).

A study by Cluskey and Grobe (2009) specifically addresses the transitional period into college, dietary and weight struggles, and the potential for these maladaptive

behaviors to impact future health. The authors state that the transitions and turning points one encounters when entering college can be destabilizing and prompt people to learn new ways to adapt (Cluskey & Grobe, 2009). The consequent choices and actions of this adaptation evolve into established responsive behavior over time (Cluskey & Grobe, 2009). Their paper explores the adaptation of weight changes in relation to the transition into college.

The Cluskey and Grobe (2009) study used a repeated measures design to assess weight measurements of 523 college students with a mean age of 19.02 years old. The response rate of this study was unique in that a large percentage of the participants were male; 379 or 60% were male and 144 or 40% were female. Weight and height measurements of participants were taken by researchers in October and December (8 weeks apart). Weight was measured to the nearest 0.5 pound by a Healthometer waist high dial scale. Height was measured to the nearest 1/8<sup>th</sup> inch by a Body Meter Measuring Tape wall stadiometer. While the participants were fully dressed, they did remove shoes and “heavy outerwear.” Identical protocol was used in both October and December. The authors used descriptive statistics to explain the demographic characteristics and t-tests to show the weight changes between October and December.

From October to December, 144 subjects dropped out leaving a reduced sample size of 379 subjects ( $n = 379$ ). Results of this study revealed that there was a significant increase in BMI from October to December ( $p = 0.0001$ ). During this time 26% of females and 27% of males gained  $> 2.3$  kg. As a group, females were more likely to lose weight while men were more likely to gain weight showing greater increase in BMI. While the P value is significant, it indicates little about the mechanism of weight gain-

i.e., consuming more calories, radical diet change, lifting more weights and trying to gain weight. To further understand this and how the college transition impacts eating behaviors, the researchers developed four “ exploratory focus groups.” Limitations of this study are the size of the focus groups and the single college sample in one location. Although the focus group size was a limitation the authors thought it was important to further understand the student’s perceptions with regards to this specific transition.

Groups were divided as follows: two groups had five males, one group had four females and one group had five females. Results indicated that students came to college with established eating and exercising behaviors and habits, however; the stressful transitional period required adaptations and created changes. Almost all of the focus group participants were in agreement that while attending college was important, the transition presented challenges with regards to health behaviors, particularly healthy eating. Establishing support systems, routines, and motivation were identified as critical factors in maintaining or creating stability in healthy eating behaviors (Cluskey & Grobe, 2009).

The transition into college has been identified as a critical period of risk and influence. Vulnerability to psychological distress appears to increase the risk of maladaptive changes to a variety of health behaviors, particularly eating behavior. From the perspective of life span health, knowing that actions and choices evolve into behavior, it is advantageous to better understand the factors that influence behavioral adaptations during the college transition in order to help college students develop and stabilize healthy behaviors and coping skills during this time.

## Stress

**Operational definition.** While there are numerous definitions of stress, perhaps the best overall definition is: “ the generalized, non-specific response of the body to any factor that overwhelms, or threatens to overwhelm, the body’s compensatory abilities to maintain homeostasis or psychological well being” (Torres & Nowson, 2007, p. 887). The typically identified types of stressors; physical, chemical, physiologic, psychological, emotional and social are clearly not unrelated to the college transitional period (Torres & Nowson, 2007). Stress is generally viewed as a subjective concept given that individual reactions to a situation or event are greatly based on “ ...perceptions, expectations, experiences, moods, and appraisals of the stressors” (Franks, 1994, p. 3). Individual perception of whether a stressor is threatening or harmful significantly determines one’s response (e.g., physiological, cognitive, emotional, and behavioral reactions) to the situation (Frank, 1994). While individual response to stress may vary, in general stress is thought to be problematic when the perceived demands exceed one’s ability to cope with the situation or stressor (Dyson & Renk, 2006).

Stress is further identified as being either *acute* or *chronic* depending on how long lasting and intense the situation or stressor is. The American Psychology Association (APA) (2013) defines acute stress as that which “ comes from demands and pressures of the recent past and anticipated demands and pressures of the near future.” This type of stress is considered more *treatable* or *manageable* as it is usually an isolated incident or experienced during a short period of time. The APA (2013) defines chronic stress as “ the stress of unrelenting demands and pressures for seemingly interminable periods of time.” \_Chronic stress is experienced “ day after day, year after year” and is oftentimes

described as feeling “ never-ending (APA, 2013). Chronic stress is associated with maladaptive coping responses, negative health behavior outcomes, and disease (Torres & Nowson, 2007). Developing a stronger understanding of the stressors, risks, and coping adaptations of college freshmen is a critical step in insuring that stress during the college transition is acute and manageable and does not evolve into more chronic pressures, maladaptive responses, and negative health behavior outcomes.

**Health risks associated with stress.** Research has determined that there are significant health risks associated with stress (Cohen & Williamson, 1988). The risk of disease is presumed to increase when individuals appraise a situation or event as threatening and believe they lack sufficient coping skills to meet the demand (Cohen & Williamson, 1988). “ It is not stress itself that has unfavorable consequences for the individual, but failure to cope effectively in stressful situations” (Laitinen, Ek, & Sovio, 2001, p. 29). An individual’s ability to cope with a situation depends, in part, on their perceived resources and evaluation of the level of control they have over the situation (Laitinen et al., 2001). Cohen and Janicki-Deverts (2012) state “ the perception of stress may influence the pathogenesis of physical disease by causing negative affective states which then exert direct effects on physiological processes or behavioral patterns that influence disease risk” (p.1321 ).

Responses to both acute and/or chronic stress may lead to significant physiological changes in the body including: slower digestion, elevated blood pressure, increased heart rate, and increased triglyceride levels (Torres & Nowson, 2007). Stress is further associated with coronary heart disease, type 2 diabetes, hypertension, dyslipidemia, and the specific presence of abdominal obesity (Torres & Nowson, 2007). Research has

suggested that abdominal obesity is partially increased by the physiological stress response of the activation of the hypothalamic-pituitary-adrenal (HPA) axis. The HPA axis causes an increase in cortisol which “leads to activation of adipose tissue lipoprotein lipase and then accumulation of abdominal fat mass” (Torres & Nowson, 2007, p. 892). Furthermore, research has established that stress may increase or decrease appetite such that it may lead to “disordered eating” contributing to issues such as obesity and bulimia (Streigel-Moore, Silberstein, Frensch, & Rodin, 1988).

Psychological stress contributes to “poorer health practices, increased disease risk, accelerated disease progression, greater symptom reporting, more frequent health service utilization, and increased mortality” (Cohen & Janicki-Deverts, 2012 p. 1322).

Heightened levels of psychological stress are specifically associated with elevated markers of biological aging, higher cortisol levels, suppressed immune function, increased infection-induced release of pro-inflammatory cytokines, greater susceptibility, slower wound healing, higher prostate specific antigen levels, decreased sleep, abnormal dietary habits and increased consumption of alcohol (Cohen & Janicki-Deverts, 2012). Further, chronic psychological stress is associated with anxiety, depression, uneasiness, anger, apathy, and alienation (Torres & Nowson, 2007). It is clear that increased levels of stress can significantly impact the health of individuals or that of a particular population vulnerable to certain circumstances.

**Risks associated with stress in college freshmen.** Research exploring the university transition predominantly evaluates the psychological component of stress and associated behavioral outcomes (Dyson and Renk, 2006; Von Ah et al., 2004). College freshmen are often at risk of a range of psychological symptoms associated with increased stress

and maladaptive coping during the college transition. Symptoms may include absent-mindedness, obsessionality, homesickness, loneliness, hopelessness, sadness, low self-appraisal, mistrust, low social support, and depression (Dyson and Renk, 2006).

Increased stress during the college transition is also associated with tobacco use, alcohol abuse, sleep disturbance, physical inactivity, and unhealthy eating habits. Specifically, it has been suggested that stressors experienced during this time may put students at greater risk for maladaptive eating and possible development of eating disorders (Berg et al., 2009).

**Perceived stress scale.** The Perceived Stress Scale (PSS) was designed to “measure the degree to which situations in one’s life are appraised as stressful” (Cohen, Kamarck & Mermelstein, 1983, p. 385). The PSS is the most widely used psychological survey tool for measuring perceived stress (Cohen et al., 1983). The questions were designed to be general to all populations and are therefore not specific to any subpopulation group (Cohen et al., 1983). The design of the PSS was for people with at least a junior high school education (Cohen & Williamson, 1988). The scale includes questions about current levels of experienced stress as well as stress in the last month. The PSS is easy to administer and only takes a few minutes to answer. It is significant to note that because stress can change quickly regarding daily hassles or sudden life events, the “predictive validity” of the scale is suggested to “fall off” after four to eight weeks (Cohen & Williamson, 1988, p. 35).

The PSS was originally designed as a 14-item questionnaire with a five point Likert-type scale (0= never, 4= very often). The total PSS score is acquired by reversing the Likert-type scale scores such that 0=4, 1=3, 2=2, 3=1 and 4=0. The total of each



individual test is summed for score determination (Cohen et al., 1983). The PSS is not a diagnostic tool and there are no cut-offs, therefore the only way to *score* people is by individual comparison or evaluation within a collected sample (Cohen et al., 1983).

Cohen and Williamson (1988) conducted a study in the United States which explored a probability sample of 2,387 people, 1427 females and 960 males. The purpose of their study was to reexamine the psychometric characteristics of the 14-item Perceived Stress Scale. During this study, the 14-item PSS was used as well as validated measures and independent questions for the following: perceptions of stress, self-reported health and utilization of health services, health behaviors, life satisfaction, help seeking behaviors and demographic data (Cohen & Williamson, 1988).

The existing PSS was analyzed using a principal components method. This analysis showed that 10 items loaded positively with .48 or above while 4 remaining items had low factor loadings of .17, .33, .11 and .39. As a result of these findings, a 10-item Perceived Stress Scale was created eliminating items 4, 5, 12 and 13 (Cohen & Williamson, 1988). Deleting these four specific items increased the internal reliability (alpha coefficient= .78). The 10-item PSS, including items 1-3, 6-11 and 14, is now the most widely used scale to assess perceived stress. The revised PSS-10 is stated to “measure the degree to which one perceives aspects of one’s life as uncontrollable, unpredictable, and over-loading” (Cohen & Williamson, 1988, p. 35).

Identical to the PSS-14, the PSS-10 is measured using a 5-point Likert scale (0= never to 4= very often). The PSS-10 assesses individuals feelings and experience of perceived stress over the last month. Due to the subjective nature of the concept of stress and appropriate way to measure such, there remain no cut-offs to categorize individual or

populations, nor is the PSS-10 a diagnostic tool (Roberti et al., 2006). However, numerical scores are given to associated questions such that a higher composite score indicates a greater level of perceived stress (Roberti et al., 2006).

Roberti et al (2006) sought to further support the use of the PSS-10 as an accurate measure of perceived stress. The specific purpose of this study was to “ provide factorial analytic findings, construct validation, and normative data for the PSS-10 (Roberti et al., 2006, p. 136). Acknowledging the stressful transition into college, this study population consisted of U.S. college students from multiple locations.

Participants of this study consisted of 285 undergraduate students from three public universities in the southeast United States. The student group was primarily female, 225 females, 60 males. The age of participants ranged from 17 to 60 years old, with a mean age of 23.8 years old (Roberti et al., 2006). The sample consisted of 82.1% Caucasian, 4.2% Hispanic, 4.2% African American, 2.1% Asian, 0.7% Native American, and 6.7% other (Roberti et al., 2006).

Data was collected from three different universities during the same time period. The data was collected during regularly scheduled class time (introductory classes across various disciplines), the students were allowed as much time as needed to finish the questionnaires. Participation was completely voluntary and no compensation was given (Roberti et al., 2006). All collected data was kept confidential and no identifying information was gathered (Roberti et al., 2006).

In total 6 questionnaires were administered to the students. Questionnaires included: PSS-10, Sensation Seeking Scale (Form V), State-Trait Anxiety Inventory-Trait version,

Multidimensional Health Locus of Control, Santa Clara Strength of Religious Faith Questionnaire (Short Form), and Adult Aggression Scale (Roberti et al., 2006).

Exploratory factor analysis was used to evaluate the study data. This study was successful in supporting the validity and reliability of the PSS-10 to measure perceived stress within a nonclinical, college student population. Additionally, this study yielded normative findings (means and standard deviations) of the PSS-10 among college students (Roberti et al, 2006). Clearly, the PSS-10 is a reliable and valid means of measuring levels of perceived stress.

### **Eating Behaviors**

Eating behaviors have been widely studied using a variety of definitions, constructs, measures, and populations. “Eating behavior is generally accepted to be the outcome of internalized multidimensional constructs that include behavioral, cognitive, and affective components” (Bond, McDowell, & Wilkinson, 2001, p. 900). For the purposes of this study, eating behaviors will be defined using the core constructs of the Three Factor Eating Questionnaire (TFEQ): restraint, disinhibition, and hunger (Stunkard & Messick, 1985).

The concept of “restraint” or “restrained eating” is founded in Polivy and Herman’s (1985) earlier work. In literature, restrained eating is defined as: “the tendency of some persons to restrict their food intake in order to control their body weight” (Stunkard & Wadden, 1990, p. 78). Conceptually, the definition of “restraint” has been further expanded to include: “the conscious restriction of food intake to prevent weight gain or promote weight loss” (Hays & Roberts, 2008, p. 52). Literature also clearly states that the eating behavior of restraint is a robust predictor disinhibition (Polivy & Herman,

2002). While it is possible for restrained eaters to successfully diet for a period of time, often particular events or situations will interrupt their self-control and consequently lead to overeating (Bond et al., 2001). “ With their customary dietary controls temporarily undermined by stress, the cognitive and/or physiological characteristics associated with restraint may cause restrained eaters to eat with abandon” (Lowe & Maycock, 1988, p. 396).

The concept of “ disinhibition” is defined as: “ the tendency to overeat in response to different stimuli” (Hays & Roberts, 2008, p. 52). This type of eating behavior can occur when one is experiencing emotional distress or is exposed to a variety of appetizing foods (Hays & Roberts, 2008). The behavior of disinhibition can further be explained as eating without the compliance of restraint or the awareness of hunger.

Conceptually, hunger is defined as: “ the susceptibility to eat in response to perceived physiological symptoms that signal the need for food” (Hays & Roberts, 2008, p. 52). It has further been explained that hunger includes the psychological sensations that initiate the behavior of eating (Radimer, Olson, Greene, Campbell, & Habicht, 1992). Research has well established the postulation that hunger is a subjective state (Radimer et al., 1992). “ The subjective state may be thought of as epiphenomenal: occurring in parallel with the operation of the physiologically based regulatory system but not directly involved in regulation” (Radimer et al., 1992, p. 159). Clearly, both physiological and psychological symptoms and sensations contribute to the recognition of hunger.

**Maladaptive Eating Behaviors and Stress.** Hormones released in response to stress have been found to affect both appetite and eating behaviors. Noradrenaline and corticotropin-releasing hormone have been reported to suppress appetite during stress,

whereas cortisol released in response to stress has been associated with stimulating the appetite and impacting the macronutrient food of choice during recovery from stress; hence, increasing the tendency of consumption of high fat and sweet foods (Epel, Lapidus, McEwen, & Brownell, 2001; Torres & Nowson, 2007). Research suggests that the specific eating response may depend on the severity and longevity of the stressor (Torres & Nowson, 2007).

The unique social and academic stressors associated with the college environment may put students at increased risk for maladaptive eating behaviors and patterns (Berg et al., 2009). The psychological response to stress has been demonstrated to impact subsequent eating behaviors resulting in both increased and decreased food consumption along with an increased propensity for the development of eating disorders (Epel et al., 2001; Berg et al., 2009; Delinsky & Wilson, 2008). Cluskey and Grobe (2009) suggest that eating behaviors established during the transitional period into college could “initiate life-long weight struggles and associated health problems” (p. 325). Research has indicated that freshmen are at increased risk for both weight gain and the development of eating disorders during the freshmen year (Berg et al., 2009; Levitsky, Halbmaier, Mrdjenovic, 2004). Knowing that the behavioral response to stress can become habitual, it is important to understand the association between stress and food as disordered eating behaviors can lead to issues such as obesity or bulimia (Epel et al., 2001).

Torres and Nowson (2007) postulate that stress may cause some individuals to consume food in excess which could result in weight gain and potentially increase the risk of obesity. The adaptive behavior of stress related eating, a behavior associated with increased levels of cortisol, is an attempt to make oneself feel better by eating foods that

reduce the stress response (Epel et al., 2001; Laitinen & Sovia (2002). Levitsky et al (2004) found the myth of the “ Freshmen 15” (gaining 15 pounds during the freshmen year) to be true. Their study showed that on average students consumed approximately 200 calories more per day of their freshmen year, which cumulatively (over an academic year) had significant effects on their weight (Levitsky et al., 2004).

Although abnormal eating behaviors are associated with weight gain in freshmen, they are also associated with eating disorders that may involve under-eating. A 2005 study showed that two-thirds of college women developed either *intense* or *at risk* eating behaviors that put them at risk for an eating disorder (Krahn, D.D., Kurth, C.L., Gomberg, E., & Drewnowski, A., 2005). Further, dietary restraint, binge eating, and bingeing and purging have been associated with eating behaviors related to stress in both males and females and can lead to diagnosable eating disorders of anorexia or bulimia nervosa (Berg et al., 2009; Cluskey & Grobe, 2009).

**Three Factor Eating Questionnaire.** The Three Factor Eating Questionnaire has been established as “ the most widely used scale to quantify eating behaviors” (Mazzeo, Aggen, Anderson, Tozzi, & Bulik, 2003). Stunkard and Messick (1985) developed the TFEQ because there were deficiencies in previously existing scales used to look at eating behaviors, particularly restraint. While the TFEQ was initially developed within and for an obese population, research has shown that this scale appropriately measures eating behaviors in all populations (Angle, Engblom, Eriksson, Kautiainen, Saha, Lindfors, Lehtinen, & Rimpela, 2009). The TFEQ identifies eating behaviors and patterns by looking at three separate categories related to eating: restraint, disinhibition and hunger. Each of the three constructs has a number of associated questions: restriction has 21

items, disinhibition has 16 items and hunger has 14 items. A portion of the questions are true/false (true=1 and false=0) while the remainder are measured on a Likert-type scale, 1-4. The score is assessed by way of totaling all scores; the higher the score, the “higher the level of restrained eating, disinhibited eating and greater predisposition to hunger” (Bond et al., 2001, p.901). The original TFEQ consists of 51 questions, although more recently, both an 18-item and a 21-item have been adapted (de Lauzon, Romon, Deschamps, Lafay, Borys, Karlsson, Ducimetiere, Charles, 2004; Cappalleri, Bushmakina, Gerber, Leidy, Sexton, Lowe, & Karlsson, 2009). The primary purpose of these adaptations is for ease of use in large epidemiological studies that are comprised of multiple questionnaires (de Lauzon et al., 2004). Interestingly, the constructs are no longer the same; the revised edition looks at cognitive restraint, emotional eating and uncontrolled eating (de Lauzon et al., 2004). Although a newer version is available, the current study utilized the original TFEQ.

The Three Factor Eating Questionnaire has been proven to be both valid and reliable by Stunkard and Messick in 1985. More recently in 2001, Bond et al, examined the factor structure of the TFEQ to better understand the subscales within each construct. The first construct is restraint which is comprised of three subscales: strategic dieting behavior, attitude to self-regulation, and avoidance of fattening foods. The second construct is disinhibition which includes: habitual susceptibility, emotional susceptibility and situational susceptibility. The third construct of the TFEQ is hunger which includes the subscales of: internal locus for hunger and external locus for hunger.

The 2001 study by Bond et al, was conducted looking at previously existing data of 553 undergraduate women at a university in Australia. The data had been collected as

part of a laboratory practical on anthropometric measurements. The mean age of the population was 25 years old. The collected measures included the TFEQ and demographic measurements of age, height, weight and whether they were satisfied with their weight.

For the sake of this study, any item that had a loading of .45 or greater was further examined to assess internal reliability to the scale construction. One year later, a re-test was done with 64 subjects (from the original sample). At this point it was found that correlations were high for all the measured behaviors within each construct, except “avoidance of fattening foods” which was 0.53).

Research has shown that the Three Factor Eating Questionnaire is a valid and reliable tool for measuring eating behaviors in general populations.

### **Self-Compassion**

**Operational definition.** Although the concept of self-compassion has existed for centuries in Eastern philosophy, the formal conceptual definition and establishment in Western psychology and science is far more recent (Neff, 2011; Allen & Leary, 2010). The idea of self-compassion stems from that of compassion for others. Compassion includes being aware of a persons suffering and offering kindness towards them and being non-judgmental and understanding of “ shared human fallibility” and its encompassing actions (Neff, 2003). The concept of self-compassion is identical in nature, but applies directly to oneself by:

being open to and moved by one’s own suffering, experiencing feelings of caring and kindness toward oneself, taking an understanding, non-judgmental attitude



toward one's inadequacies and failures, and recognizing that one's experience is part of the common human experience. (Neff, 2009 p. 212).

A more condensed expression of this concept would be “treating oneself kindly when things go wrong” (Allen & Leary, 2010, p. 107). Self-compassion is now well established and accepted in research as consisting of the constructs: self-kindness, mindfulness, and common humanity (Neff, 2003).

Self-kindness is described as having an attitude of being gentle, caring and understanding with oneself (Neff, 2011). This construct includes being accepting toward and supportive of oneself during times of failures, flaws, or personal inadequacies (Neff, 2011). Neff and McGehee (2010) explain self-kindness as having “care and understanding, rather than harsh self-judgment” (p. 226). Self-kindness further involves being thoughtful and sensitive towards one's experiential feelings rather than being critical of oneself (Allen & Leary, 2010).

The second construct of self-compassion is common humanity. In the framework of self-compassion, common humanity involves understanding that all people make mistakes, feel inadequate, and suffer in some way (Neff, 2011). This definition further embraces the idea that imperfection is understood as part of the human condition, such that people can feel connected, rather than isolated, by this commonality (Neff, 2011; Neff & McGehee, 2010).

The third concept of self-compassion is mindfulness. Brown and Ryan (2003) describe mindfulness as it applies to self-compassion as “being aware of present moment experiences in a clear and balanced manner so that one neither ignores nor ruminates on disliked aspects of oneself or one's life” (p. 822). Likewise, mindfulness inhibits over-

identifying or being swept away with one's own thoughts and story (Neff, 2003). Neff (2011) suggests that over-identifying prompts people to obsess, ruminate, and get lost in their own negativity, therefore losing balanced perspective. Yet, in order to clearly recognize one's own suffering or discomfort, it is necessary to be *aware* of thoughts and feelings, not ignoring or being oblivious to them (Neff, 2011).

In recent literature, improvements in both negative and positive psychological outcomes have been associated with higher self-compassion. Levels of higher self-compassion have been associated with decreases in self-criticism, depression, neuroticism, rumination, and anxiety (Neff, 2009, 2011; Allen and Leary, 2010). With respect to positive psychological outcomes, higher levels of self-compassion have been associated with “greater life satisfaction, emotional intelligence, social connectedness, learning goals, wisdom, personal initiative, curiosity, happiness, optimism, and positive affect” (Neff, 2011, p. 5). Consistent with these findings, the concept of self-compassion includes a “desire for the self's health and well-being” (Neff, 2009, p. 213).

**Self-Compassion and Self-Esteem: A Comparison.** Self-compassion is different from the well-known psychological concept of self-esteem. Neff (2011) distinguishes between these two concepts by explaining self-esteem as “an evaluation of our worthiness as individuals, a judgment that we are good, valuable people” (p. 1). This evaluation is often based on the comparisons, judgments and assessments of others; therefore self-esteem is more of an external rather than an internal process and understanding (Neff, 2003). It is also important to note that self-esteem is usually the result of something being done, accomplished, or proven as opposed to an innate sense of kindness and connectedness even in the face of failure or inadequacy (Neff, 2011).

People with high self-esteem exhibit positive emotions of being motivated, happy and optimistic; however, there are drawbacks (Neff, 2011). Literature has clearly demonstrated that self-esteem is associated with narcissism and resistance to change (Neff, 2011). Self-esteem is viewed as a more conditional concept than self-compassion; the rise and fall and external evaluation of self-esteem can make people more susceptible to anxiety and depression (Neff, 2011).

Self-compassion helps exactly where self-esteem does not, when people acknowledge “flaws” or “failures” they are not judged for doing or being wrong, but rather are supported in an open, kind and understanding manner (Neff, 2003, 2011). Self-compassion is considered a “healthy alternative” to self-esteem, such that it provides the positive aspects unconditionally without the negative drawbacks (Neff, 2003).

### **Self-Compassion and Stress**

Research has established that self-compassion is associated with the emotional regulation process whereby individuals “pay attention to their emotions, manage intensity and duration of emotional arousal, and transform the nature and meaning of feeling state when faced with stressful or distressing situations” (Neff, 2003, p. 91). Self-compassion helps individuals to be aware of their emotions in various painful or stressful situations such that feelings are not avoided but rather met with a sense of kindness, common humanity and mindful awareness (Neff, 2003). This awareness of emotions and attitude of compassion towards oneself allows for greater comprehension of the situation and an increased ability to take appropriate and effective actions (Neff, 2003). The adaptive response of effective coping skills can be highly beneficial to people in stressful situations. Gilbert (2005) theorized that the self-soothing features of self-

compassionate thoughts serve to promote calm by deactivating the neurological “defensive threat system” (p. 264). Allen and Leary (2010) state “people who are high in self-compassion construe negative events in less dire terms than people low in self-compassion” and are less apt to engage in negative thoughts such as ‘Why do these things always happen to me?’ or ‘I’m such a loser’ (p. 109).

In a 2009 study, researchers sought to “determine the relative contribution of self-compassion to students sense of well-being over and above the contribution of a measure of students’ experience of stressful life events” (Neely et al., 2009, p. 88). Neely et al., (2009) hypothesized that “self-compassion would be as important a contributor, or possibly more important, than the ability to manage and regulate one’s goals in the face of life’s stresses” (p. 90). Participants consisted of 203 undergraduate students (141 men, 62 women) enrolled in an educational psychology course. Of the study population, 127 were seniors, 33 juniors, 30 sophomores, and 13 freshmen; the majority, 87%, was under 22 years of age. Ethnically the group consisted primarily of White/European, 53% (Neely et al., 2009).

To measure student well-being the following measures were used: the Purpose in Life subscale (taken from the Scales of Psychological Well-Being), the Self-Mastery subscale (taken from the Structure of Coping Scale), the Perceived Stress Scale, the Intrusive Thoughts Scale, and the Satisfaction with Life scale. Additionally, Neely et al (2009) combined the above scales into a single index to assess whether the scales were appropriately reflecting a single factor of well-being. The predictor measures were the Goal Disengagement and Goal Reengagement scales, the Student Stress Scale, and the Self-Compassion Scale.

The collected data were analyzed using a hierarchical regression which predicted the well-being index as established with the independent variables. Self-compassion was found to be a “ significant ( $p < .05$ ) predictor to the regression” (Neely et al., 2009, p. 95). Importantly, the authors note: “ Self-compassion in particular seemed a reliable correlate of students’ reported well-being...The way that students managed their negative emotions in the face of disappointment was a significant contributor to their well-being” (Neely et al., 2009, p. 95). The findings of this study support Neff’s earlier work related to self-compassion and well-being. Additionally, these findings held true for the direct inverse association between self-compassion and the Perceived Stress Scale (Neely et al., 2009).

In a 2010 article, Allen and Leary sought to understand how individuals higher in measured self-compassion cope with stressful situations and events. Although much is understood about coping strategies and processes that impact how people deal with stressful situations, far less is known about the role that the concept of self-compassion may have on coping. Allen and Leary (2010) state: “ The degree to which people cope effectively with stressful life events is a primary determinant of their subjective well-being” (p. 108). Knowing that self-compassion is highly associated with well-being and decreased anxiety in response to stressors, it is logical to postulate that it may be associated with better coping mechanisms (Neff & Kirkpatrick, 2007; Allen & Leary, 2010). Their study explored the outcomes of self-compassion on the principal classifications of coping, as identified by Skinner and colleagues: positive cognitive restructuring, problem solving, support seeking, distraction, and escape/avoidance (Allen

& Leary, 2010). The coping mechanism outcomes were explored in relation to self-compassion through previously conducted research and studies.

As a result of their work, Allen and Leary (2010) found that self-compassion is most strongly correlated to the coping mechanism of “ positive cognitive restructuring.” Positive cognitive restructuring is defined as “ changing one’s view of a stressful situation in order to see it in a more positive light” (Allen and Leary, 2010, p. 109). This assessment and finding are in line with previous research stating that higher self-compassion is consistently and strongly correlated with decreased rumination, obsession, depression, and neuroticism as well as increased happiness, well-being, optimism, personal initiative, emotional intelligence, and social connectedness (Allen and Leary, 2010; Neff, 2011). In conclusion, Allen and Leary (2010) state: “ self-compassion involves thinking about stressful situations in ways that enhance coping” (p. 115). Clearly there is an evidence base to support the use of self-compassion as a means of improving one’s ability to cope with stressful situations and events.

### **Self-Compassion and Health Behaviors**

In her earlier work with self-compassion, Neff (2003) postulated that the inherent caring nature of self-compassion should yield a “ powerful motivating force for growth and change” (p. 87). The framework for growth and change is rooted in the three foundational concepts of self-compassion which allows people to see their situations more clearly and to better relate to themselves (Neff, 2003). From a place of greater accurate self-perception, one has the enhanced propensity to correct and change “ maladaptive patterns of thought, feeling and behavior” (Neff, 2003, p. 87). Stronger self-compassion can foster and support the decision to surrender “ harmful behaviors to

which one is attached...encouraging oneself to take whatever actions are needed-even if painful or difficult- in order to further one's well-being" (Neff, 2003, p.88)

Science has clearly accepted the premise that oftentimes health problems are a direct result of habitual maladaptive health behaviors (Terry & Leary, 2011). While simple acts could improve their health, individuals frequently engage in negative health related behaviors that "directly threaten their health" (Terry & Leary, 2001, p. 352). Terry and Leary (2011) clearly state: "Failures of self-regulation are a general and widespread problem, but failing to manage health-related behaviors can have particularly pernicious consequences" (p. 352). Self regulation is most simply defined as: "setting a goal, engaging in goal-directed behavior, monitoring progress toward the goal, and adjusting one's behavior when sufficient progress towards the goal is not being made" (Terry & Leary, 2011, p. 352). Even with the proper time, knowledge, and resources, it is often difficult for people to regulate and adhere to the appropriate health-related behaviors (Terry & Leary, 2011). However, research documents that individuals with higher self-compassion may be more successful at appropriately selecting health goals. Beyond the initial goal, it is postulated that higher levels of self-compassion can help individuals to engage in specific behaviors to attain their goals, monitor and evaluate progress with the goal, and make behavioral adjustments as needed to promote sufficient progress in accordance with the goal (Terry & Leary, 2011).

Given the strong correlations between self-compassion and psychological well-being indices, more recent studies have explored the possible association and role of self-compassion in various behavioral outcomes. With respect to health behavior changes, research has explored correlations between self-compassion and smoking, motivation to

exercise, eating behaviors, body image, interpersonal conflict resolution and academic achievement.

**Self-compassion and smoking.** A 2010 study was designed to explore the impact of self-compassion on the behavior of smoking (Kelly, Zuroff, Foa, & Gilbert, 2010). This study sought to better understand the relationship between self-compassion and self-regulation as related to the reduction cigarettes smoked per day. Self-regulation is recognized when a person “ devotes energy to override a natural response or behavior and replace it with a more effortful one that is more consistent with his or her goals” (Baumeister & Vohs, 2004, p. 255). Kelly et al (2010) speculated that while some people utilize self-regulation by means of being hostile, taxing and critical with themselves, others have a more compassionate approach which includes that of feeling supported, deserving, responsible and courageous.

This study was designed to analyze the association between the self-compassion and the behavior of smoking and to further determine if the self-regulation of smoking could be mediated by a self-compassion intervention. Research recognizes that one of the strongest predictors of smoking cessation is how people cope with their potential relapses (Kelly et al., 2010). Kelly et al (2010) postulated that self-compassion could help smokers gain self-regulation thereby improving their coping skills and helping them resist the urge to smoke. This study looked at a self-compassion intervention compared to a self-monitoring intervention on reduction of cigarettes smoked per day as well as subjects readiness to change.

In order to be eligible, subjects had to have smoked for at least one year and currently be smokers, smoking at least one or more cigarettes per day. Additionally, they needed



to desire to quit smoking within the next 6 months (Kelly et al., 2010). Exclusion criteria included: currently being in therapy, using psychotropic medications or nicotine substitutes, having participated in a smoking cessation program in the last 6 months, active drug or alcohol abuse or friend, partner or relative in the current study. Upon eligibility, subjects were assigned to one of four intervention program. In total, 55 males and 64 females participated in the study and their mean age was 24.42 years old, with 64% being Caucasian (Kelly et al., 2010).

Participants in all four groups were asked to record their Cigarettes Per Day (CPD) over the course of the three-week intervention via email self-report. Participant's willingness to change their behavior was measured with the Smoking Stage of Change-Short Form. Self-criticism was measured using the Depressive Experiences Questionnaire (DEQ) and the Self-Compassion Scale (SCS) (Kelly et al., 2010).

Subjects were asked to come into the lab at the start of the first week and at the end of the third week. Upon completion of the third week, subjects received remuneration of \$25 per week. All four of the intervention conditions included a component of self-monitoring and therefore participants were given a rationale regarding the value of becoming increasingly aware of their smoking habits and patterns (Kelly et al., 2010). Subjects were required to record information (once in the morning and once in the afternoon) pertaining to the last two cigarettes they either smoked or resisted (Kelly et al., 2010).

In the self-compassion intervention, it was explained to subjects that they were going to learn self-compassionate talk and imagery to help reduce their incident of smoking.

The format of this information was presented in a slideshow with the following explanation (Kelly et al., 2010).

When someone acts in a warm, kind, and caring way with us, they send us external signals of compassion, making us feel safe and soothed. But we can also imagine someone acting toward us in a warm, kind and caring way, or actually talk to ourselves in this way, and send our brain internal signals of compassion. Again, doing either of these things internally creates the same safe and soothed response in our brain and body (Kelly et al., 2010, p. 738).

The next part of the slideshow focused on using self-compassionate images to support the subjects through the challenges of smoking cessation. Subjects were asked to visually create a self-compassionate image that could be thought of as a person they could become. Upon creation of this visualization, subjects were asked to write themselves a letter from the self-compassionate point of view (Kelly et al., 2010). The goal of the letter writing exercise was to further support the subjects with regards to the difficulties of smoking reduction. Subjects in this group were advised to use all of the above tools over the following weeks (Kelly et al., 2010).

The other intervention groups were based on self-energizing and self-controlling. The format was identical to that of the self-compassion intervention, but the instructions, rationales, content and self-talk guidance were different. The focus of the self-energizing group was to create a visualization of an energizing image and to cheer themselves on when they felt the urge to smoke. The focus of the self-control group was to create a visualization of an instructive image that was more authoritative and direct when the urge to smoke arose (Kelly et al., 2010). The fourth group was the baseline group which

required subjects to simply self-monitor and record urges to smoke and number of cigarettes smoked per day (Kelly et al., 2010).

Results of this study showed that while the self-compassion intervention reduced the number of cigarettes smoked per day more quickly than the baseline self-monitor group ( $p < .05$ ), so did the self-energizing and the self-controlling interventions. The self-compassion intervention greatly reduced the cigarettes per day in the group of subjects with identified low readiness to change ( $p < .001$ ). Additionally, the self-compassion intervention revealed a significant reduction rate in cigarettes per day among highly self-critical subjects ( $p < .001$ ) (Kelly et al., 2010).

This study was limited in its length of time, being only three weeks, due to which the goal of this study was to reduce cigarettes per day rather than achieve total smoking cessation. Another limitation was that questionnaires and subsequent journal entries of smoking were all self-report. The smokers in this study were all light smokers, so the degree to which this intervention would be applicable to a heavy smoking population is not determined (Kelly et al., 2010).

The study by Kelly et al (2010) showed that a self-compassion intervention could help reduce the number cigarettes smoked per day, especially in people with low readiness to change and high self-critical evaluation. With regards to reduction of cigarettes per day and potential cessation, self-compassion may be a strong strategy for self-regulation (Kelly et al., 2010).

Clearly, research has demonstrated a correlation between self-compassion and positive psychological outcomes as well as a negative correlation with undesired behavioral outcomes (Neff, 2003; Neff, 2009; Neff & McGhee, 2010; Wasylkiw, Mackinnon,

MacLellan, 2012). It has been established that self-compassion helps one to have a positive and healthy concept of the self (Neff, 2003, 2011). The positive psychological outcomes of happiness, optimism, higher reflective, affective and cognitive wisdom and personal initiative may in part explain the outcomes of the following study (Kelly et al., 2010).

**Self-compassion and exercise.** Magnus and colleagues conducted a study to explore the possible associations between self-compassion and women's motives to exercise and exercise-related outcomes (Magnus, Kowalski, & McHugh, 2010) The premise for their study was based on the notion that exercise can present unique challenges to women with regard to the development of healthy perspectives of the self (Davis, et al., 1994).

Magnus et al. (2010) state that there is strong societal pressure to emulate the thin ideal female form and that this exact pressure is in great part what motivates women to exercise. However, it has been demonstrated that motivation for exercise based on such unrealistic outcomes are less effective over time (Magnus et al., 2010). In a 2002 study by Wilson and Rodgers, it was found that “female exercise participants who felt compelled to exercise by conforming to societal pressures or constraints were unlikely to develop long-term adaptive motivational patterns and overall self-worth” (p. 230).

Additionally, given that exercise frequently takes place in the social setting of a gym, there is increased potential for negative evaluations of one's body. The combined impact of the above led Magnus and colleagues to believe that exploring strategies for promoting healthy self perspectives is critical to improving women's exercise experience and psychological well being.

Throughout scientific literature, there is extensive research that looks at self-esteem and exercise (Neff, 2003). A recent meta-analysis of 113 studies looked at the impact that exercise had on global self-esteem (Spence, McGannon, Poon, 2005). From this study, it was determined that participating in exercise leads to small but significant increases in global self-esteem (Spence et al., 2005). Clearly, a limitation of just focusing on self-esteem with regards to a healthy perspective of oneself is that self-esteem is based on evaluation and comparison of one's self worth in relation to others (Magnus et al., 2010).

Prior to the study by Magnus et al, self-compassion had not been explored in the exercise domain. Given the strong emphasis on self-evaluation and social comparison in the context of exercise, Magnus and colleagues postulated that it is relevant to go beyond self-esteem and explore the concept of self-compassion as it relates to exercise. The purpose of this study was to explore associations among self-compassion, self-esteem, women's self-determined motives to exercise, and exercise-related outcomes.

In 2002, Landry and Solomon reviewed women's physical activity behavior and suggested self-determination theory as an appropriate structure to investigate motivation to exercise. The self-determination theory recognizes different types of motivation: external, introjected, identified, integrated and intrinsic, each having specific consequences for well-being and performance (Magnus et al., 2010). The different types of motivation create a self-determined continuum which ranges from controlled/extrinsic motivations (external, introjected) to autonomous/self-determined motivations (identified, integrated, intrinsic). Controlled or extrinsic motivations are defined as " behaviors pressured and coerced by environmental and intrapsychic force (Magnus et al., 2010, p.

365). Autonomous or self-determined motivations are defined as “ behaviors initiated and regulated through choice as an expression of oneself” (Magnus et al., 2010, p.365). Of importance is that the autonomous motivations have found to be linked to “ well-being and long-term motivation in the exercise domain” (Wilson & Rodgers, 2004). Although not yet explored until this study, similarities have been found between self-compassion and self-determination which suggest that “individuals who are self-compassionate will be more prone to autonomous motivation in the exercise domain” (Neff, 2003a).

This study aimed to investigate two main hypotheses. The first hypothesis predicted that self-compassion would be positively associated with identified, integrated, and intrinsic motivation to exercise and also task goal orientation. Consequently, self-compassion was predicted to be negatively associated with external and introjected motivation to exercise, and also ego goal orientation, social physique anxiety, and obligatory exercise behavior. The second hypothesis predicted that self-compassion would explain unique variance over and above self-esteem on motives to exercise, goal orientations, social physique anxiety, and obligatory exercise behavior.

The study participants were 252 women who ranged in age from 17-43 years old with a mean age of 21.9 years old. The women were recruited from a fitness center and from Psychology and Kinesiology undergraduate classes. The students were from a university in mid-western Canada and 242 were White, 6 were Aboriginal, 5 Chinese, 2 Filipino and 2 other. Inclusion criteria required that participants be regular exercisers; defined as exercising on average 30 minutes at least three times per week for the past three weeks. The measures used in this study were all self-report questionnaires that were delivered online; in this same manner, informed consent was obtained. Upon completion of the

survey, participants were offered the chance to win one of two fifty-dollar gift certificates.

To measure self-compassion, the 26-item Self-Compassion Scale (SCS) was used. To measure self-esteem the Rosenberg Self-Esteem Scale (RSES) was used. To measure self-determination, the Behavioral Regulations in Exercise Questionnaire (BREQ) was used. The BREQ is a 15- item scale used to measure “ self-determined motives to exercise.” The BREQ has four subscales that measure specific types of motivation: external (“ I exercise because other people say I should”), introjected (“ I feel guilty when I don’t exercise”), identified (“ I value the benefits of exercise”), and intrinsic (“ I exercise because it’s fun”). The questions are answered on a 5-point Likert-type scale from 0= not true for me to 4= very true for me. Participants were asked such questions as “ Why do you exercise?” and then answered accordingly on the Likert-type scale. The 10- point Goal Orientations in Exercise Measure (GOEM) was used to measure “ individual differences in the ways that people construe success.” This scale measures participants likelihood towards task goal orientation (“I exercise to the best of my ability”) or their likelihood towards ego goal orientation (“I know that I am more capable than other exercisers”). The GOEM uses a 5-point Likert-type scale ranging from 1= strongly disagree to 5= strongly agree. Higher scores are reflective of a higher likelihood to “ engage in task or ego goal orientation.” The 9-item version of the Social Physique Anxiety Scale (SPAS) was used to measure the “ degree of anxiety one experiences when one perceived that the physique is being evaluated or observed.” Using a 5-point Likert-type scale, participants indicate how true the statements are for them (“ I am comfortable with the appearance of my physique/figure.”). The Likert-type scale ranged from 1=not

at all to 5=extremely, the total scores ranged from 9 to 45 with higher scores indicating higher levels of social physique anxiety. The final scale used for this study was the 20-item Obligatory Exercise Questionnaire (OEQ). The OEQ was used to measure “attitudes and activities regarding personal exercise routines.” Using a 4-point Likert-type scale, 1=never to 4= always, individuals were asked to answer questions based on how frequently the statements reflect their exercise behavior (e.g., “When I miss a scheduled exercise session I may feel tense, irritable, or depressed”). Higher scores on the OEQ demonstrate a “stronger sense of obligation to exercise.”

The results of the study supported the first hypothesis in that the relationships between self-compassion and external motivation, introjected motivation, intrinsic motivation, ego goal orientation, social physique, and obligatory exercise went in the anticipated direction. The results did not show a significant relationship between self-compassion and identified motivation, integrated motivation, or task goal orientation. The second hypothesis was partially supported such that unique variance beyond self-esteem was established between self-compassion and introjected motivation, ego goal orientation, social physique anxiety, and obligatory exercise; however, this did not hold true with external and intrinsic motivation as predicted.

The findings of this study provide evidence for the premise that “self-compassion is related to well-being in the exercise context” (Magnus, et al., 2010, p. 374). Based on the correlations specific to exercise and motivation, social physique anxiety, and exercise obligation, Magnus et al postulate that developing women’s self-compassion may be important as a way to “promote a healthy conceptualization of the self for women exercisers” (Magnus et al., 2010, p. 374). While more research is needed, self-



compassion may offer a means of supporting women with positive and encouraging emotional experiences in the context of exercise.

**Self-compassion and eating.** To date, little research has been done looking at the effect of self-compassion on eating behaviors. In 2007 Adams and Leary conducted a study exploring whether self-compassion would attenuate the likelihood that restrained eaters would overeat after a particular food preload (Adams & Leary, 2007). This unique study looked at the contradictory effect of restrained eaters such that the consumption of “forbidden” foods actually resulted in increased food consumption. This complex concept was first identified by Herman and Mack (1975) and was coined the “disinhibition effect.” In this context, the disinhibition effect looks purely at overeating among restrained eaters.

A previous study exploring this concept found that restrained eaters overate after a preload they thought to be of high caloric content (Polivy & Herman, 2002). Another study compared the preload of milkshakes or cottage cheese (same caloric content) to the consumption of ice cream afterwards; results indicated greater consumption of ice cream post milkshake consumption (regardless of comparative caloric content of cottage cheese) (Knight & Boland, 1989). These studies point to a fundamental component of the disinhibition effect which postulates that restrained eaters are concerned with forbidden foods, not necessarily overall caloric content (Adams & Leary, 2007).

The psychological component of the disinhibition effect proposes that restrained eaters likely have negative views of themselves particularly in relation to food and eating; judging themselves, having self-criticism and unpleasant self-awareness (Adams & Leary, 2007). As a way of coping with negative feelings and stressful events, restrained

eaters oftentimes overeat, even when the event is having previously eaten something forbidden, thus, the initial experience of eating the negative food is in itself a stressful experience which triggers overeating as a mechanism of coping (Adams & Leary, 2007). While counterintuitive, restrained overeaters often overeat to cope with negative feelings in relation to food, eating and body image and this strategy has been found to perpetuate internal negative feelings.

The behavior of overeating in restrained eaters is associated with the outcome of a cycle of negative feelings. In their study, Adams and Leary (2007) propose that changing a restrained eaters response and behavior (negative self-thoughts and overeating) to stressful feelings may prevent the accompanying negative self-evaluation. From a psychological standpoint, people with higher self-compassion tend to ruminate less, experience increased positive emotions and have decreased extreme reactions (Adams & Leary, 2007). Restrained eaters with low self-compassion are highly critical of themselves often lacking the ability to forgive themselves and stay focused on their goals of regulated eating and health (Adams & Leary, 2007). It is established that self-compassion helps people to forgive themselves (self-kindness), increase personal awareness (mindfulness) and see their mistakes in the greater context of humanity without getting overwhelmed (common humanity) (Adams & Leary, 2007).

The goal of this study was to determine if self-compassion could attenuate the negative responses and behavior to eating forbidden foods and prevent disinhibited eating after a food consumption preload. The study participants consisted of 84 undergraduates who were enrolled in a psychology class. All subjects took the Revised Rigid Restraint Scale (RRRS) which measured the components of restrictive eating and eating guilt.

There were three conditions for the experiment: 1) preload/self-compassion, 2) preload/no self-compassion and 3) no preload control. The established preload food was doughnuts that were either glazed cake or chocolate glazed cake.

The experiment was divided into three phases. Once randomly assigned to rooms, all participants were asked to drink a full glass of water and watch a 4-minute video describing the ecosystem of the rainforest (Phase 1). During this phase the preload/self-compassion and the preload/no self-compassion groups were asked to choose and eat a doughnut and it was emphasized that they needed to consume the entire doughnut. Phase 2 consisted of the preload/self-compassion group receiving their intervention manipulation. This manipulation consisted of the researcher reading the following: “You might wonder why we picked doughnuts to use in the study. It’s because people sometimes eat unhealthy, sweet food while they watch TV. We thought it would be more like the real world to have people eat a dessert or junk food. But several people have told me that they feel bad about eating doughnuts in this study, so I hope you won’t be hard on yourself. Everyone eats unhealthy sometimes, and everyone in this study eats this stuff, so I don’t think there’s any reason to feel really bad about it. This little amount of food doesn’t really matter anyway.” This script contained the three core components of self-compassion; self-kindness, mindfulness and common humanity, and was delivered just one time. The preload/no self-compassion and the no preload control rooms didn’t receive any manipulation. All three rooms were instructed to wait for the questionnaires (Phase 3).

In Phase 3 all the rooms were given three large bowls of unwrapped candy (Reeces, Poppables, Skittles and York Poppables). Subjects in all three rooms were given Taste

Perception Rating Sheets for rating the consumed candy. Candy rating was the “cover story” for what the experiment was about. Subjects were allowed to consume as much candy as they wanted; measures were taken for each room collectively. The final phase of this experiment consisted of subjects taking a questionnaire evaluating their responses to breaking their diet and eating forbidden foods. The questionnaire was comprised of emotional ratings as well as components of self-compassion based on a Likert scale.

The results of this study showed that the subjects in the preload/self-compassion group exhibited higher self-compassion eating attitudes as compared to the preload/no self-compassion ( $p = .03$ ). Eating more candy was related to restrictive eating in the no preload ( $p = .02$ ) and the preload/no self-compassion group ( $p = .03$ ), but not in the preload/self-compassion group ( $p = .40$ ). Results indicated that increased self-compassion reduced the amount that the highly restrictive eaters consumed after preload. These results demonstrate that negative thoughts and feelings associated with self-evaluation may contribute to the behavior of disinhibition in restrictive eaters after preload. Clearly, self-compassion did attenuate the impact of the preload on negative self-thoughts and the behavior of overeating.

Adams and Leary (2007) suggest that using self-compassion may help restrictive eaters learn how to eat more balanced and healthy. Restrictive eaters with greater self-compassion may learn to respond to stress and negative thoughts with more adaptive means of coping. Greater awareness brought about by self-compassion may help restrictive eaters avoid self-judgment, develop positive coping skills and improve their behavior of self-regulation with regards to eating. More work in this field could contribute greatly to improving eating patterns and behaviors.

“Self-compassion may facilitate healthy behavior by helping people to monitor their goals with less distraction and defensiveness, consider their situation with equanimity, disengage from goals that are not in their best interests, seek medical help when needed, adhere to treatment recommendations, and regulate negative self-affect” (Terry & Leary, 2011, p. 359). Clearly the intervention or practice of self-compassion may help individuals develop stronger coping strategies for bettered health. Further, self-compassion has potential benefits that support the improvement of various health related behaviors and outcomes. A significant gap in the existing self-compassion literature is a more complete understanding of how self-compassion may help attenuate the relationship between stress and responsive maladaptive eating behaviors; the current study sought to further explore these potential associations.

### **Self-Compassion Scale (SCS)**

Neff and colleagues worked to develop a scale that would appropriately measure the conceptual definition of self-compassion (Neff, 2003a). The design of this scale was based on multiple studies. The studies explored open-ended questions relevant to the main components of self-compassion (self-kindness, common humanity and mindfulness) as well as crafted questionnaires containing potential scale items generated by researchers (Neff, 2003a). The Self-Compassion Scale resulted in six subscales that represent the positive (self-kindness, common humanity, mindfulness) and the negative (self-judgment, perceived isolation, over-identification) aspects of the fundamental components (Allen & Leary, 2010). The scale therefore has six subscale measures and an overall total score as well.

The participants of the first study included 391 undergraduate students from the educational psychology department at a large Southwestern university. Neff used previously validated scales pertinent to the framework of self-compassion to better identify and measure the proposed constructs. Additional scales included: the Marlow-Crown Social Desirability scale, the Self-Criticism subscale of the Depressive Experiences Questionnaire, the Social Connectedness Scale, the Trait Meta-Mood Scale, the Almost Perfect Scale, the Spielberger State-Trait Anxiety Inventory-Trait form, the Beck Depression Inventory, the Diener's Satisfaction with Life Scale and a single item scale assessing kindness towards oneself and others (Neff, 2003a).

Results of the data were compiled using Exploratory Factor Analysis and Confirmatory Factor Analysis. It was determined that self-compassion had a significant negative correlation with self-criticism, anxiety, depression and neurotic perfectionism. A significant positive correlation was found between self-compassion and a sense of social connectedness, repair, clarity and attention (subscales of the Trait-Meta Mood Scale) and life satisfaction. While the first study made clear that self-compassion is an accurate way to measure "healthy self-attitudes," additional research was needed to see how in an evaluative sense, self-compassion differs from self-esteem.

The second study by Neff and colleagues aimed to establish the construct differences between self-compassion and self-esteem (Neff, 2003a). The study was conducted with 232 undergraduate students (145 women, 87 men) in the educational-psychology department at a large Southwestern university. Participants were asked to take the created Self-Compassion Scale as well as the following: the Rosenberg self-esteem scale, the Self-Determination Scale, the Narcissistic Personality Inventory, the Self-Rating

Depression Scale, the Spielberger State-Trait Anxiety Inventory, the Ruminative Responses Scale, the White Bear Suppression Inventory and the Emotional Approach coping scale. The results indicated that there was a moderate association between self-compassion and self-esteem, but that self-esteem had a more significant association with narcissism than did self-compassion. Within this study, self-compassion was found to have a negative correlation with depression, anxiety, rumination and thought suppression. Self-compassion had a positive correlation with emotional processing and coping.

To further confirm the construct validity of the Self-Compassion Scale, Neff and colleagues recruited 43 Buddhist participants (27 females, 16 males) to take the SCS and the Rosenberg Self-Esteem Scale. The Buddhists were recruited via email throughout various parts of the country. Participants for this study all practiced a form of Buddhist meditation known as Vipassana which intentionally cultivates mindfulness, insight into the interdependence of all beings, and compassion for oneself and others (Neff, 2003a). Participants had been meditating from 1 to 40 years.

Results of this study showed that the Buddhist participants had significantly higher self-compassion than the undergraduate populations ( $p < .0005$ ). When the scores of self-esteem were compared between the Buddhists and the undergraduates, only a marginally significant difference was found ( $p = .08$ ). The above findings indicate that the Buddhist practice of meditation has a much stronger impact on self-compassion than on self-esteem. Additionally, these Buddhist participants had significantly higher scores on the positive self-compassion subscales of self-kindness, common humanity and mindfulness, while having significantly lower scores on the negative subscales of self-judgment, isolation and over-identification. There was also a significant correlation

between self-compassion and the number of years practiced within the Buddhist group ( $p = <.05$ ). The findings of this final study demonstrate that the Self-Compassion Scale measures what it intends to measure (Neff, 2003a). This scale is now widely used to measure the concept of self-compassion and its accompanying constructs of self-kindness, common humanity and mindfulness.



## Chapter 3

### **Methods**

#### **Study Design**

The purpose of this study was to examine relationships among the constructs of self-compassion, perceived stress, and constructs of eating behavior in college freshmen. A cross sectional study design of previously collected survey data were used to explore the possible associations between self-compassion (SCS), eating behaviors (TFEQ) and perceived stress (PSS) on male (n = 541) and female (n = 936) first time (first semester) college freshmen. This study was a secondary analysis of data collected in fall 2007 on first time freshmen students at a large metropolitan university in the southwest.

#### **Participants**

Participants were first year, first semester, full time and part time freshmen students with zero to 12 credit hours who were attending a large, multi-campus metropolitan university in the southwest. Students were entering the university in the fall of 2007 and as such were considered to be in the university transition. Students from all four campuses of the university were recruited. Approval from the Institutional Review Board (IRB) at Arizona State University was obtained prior to the execution of the proposed secondary data analysis.

#### **Recruitment**

Participant inclusion criteria was limited to first year freshmen, both full and part-time, ranging in age from 18 to 22 years old and was inclusive of both males and females. A recruitment letter (See Appendix A) was sent through the university email system to all freshman students who had active accounts as of the 21<sup>st</sup> day of the fall semester.

Students who chose to participate selected a link within the text of the recruitment letter that led to an anonymous self-administered, web-based survey. All data collected was anonymous and no identification was required or gathered. The recruitment letter served as informed consent to participate (Appendix B). In addition, students had the opportunity to enter a drawing which required them to provide their identification and email to a separate website which was stored independently of data collection.

### **Procedures**

Once participants selected the link they were provided a series of online questions pertaining to demographics and various instruments related to health. The surveys and questionnaires were made available through SelectSurveyASP Advanced 8.1.5 survey software (ClassApps.com, 2004). The surveys and questionnaire link was available for a two-week time period, during which each student could access the site only once to ensure a single response survey that was not updateable. Participants were prompted through each survey and questionnaire. At the end of each question, the software checked for completion and informed the participant of any missing data before it progressed to the following question or page.

### **Instruments**

**Demographics.** Data collected included age, sex, height, weight, ethnic descent, relationship status, religious affiliation, hours a week volunteering, hours a week working (paid job), living status and residency. Remaining demographic questions directly related to student status, campus attended, and enrollment in any other university (See Appendix C).

**Perceived Stress Scale, Version 10 (PSS).** The Perceived Stress Scale (PSS) is the most frequently used scale to measure individual psychological perception of stress (Cohen & Williamson, 1988). (See Appendix D). Items on the PSS are designed to understand subjects' perception of the degree to which their lives are “uncertain, uncontrollable or overburdened” (Cohen & Williamson, 1988, p. 32). The PSS 10, a measure supported for use in college student populations, uses a 5-point Likert-type scale, 0-4 (0= Never, 4= Very Often) based on subjects frequency of experience over the last month (e.g. ‘In the last month, how often have you felt nervous and stressed?’) (Roberti et al., 2006). The PSS is scored by reversing the scores of items 4, 5, 7, and 8 and then calculating the sum total of all 10 items (Cohen & Williamson, 1988). Higher scores indicate higher stress levels. The PSS 10 has been found to have acceptable internal reliability (alpha coefficient  $\alpha = .78$ ) (Cohen & Williamson, 1988). The PSS is not a diagnostic tool and there are no established ratings or scores as indicators of psychological symptomatology. The only way to compare groups is within the sample of each population or comparatively to other similar groups (Cohen & Williamson, 1988).

**Three Factor Eating Questionnaire (TFEQ).** The Three Factor Eating Questionnaire (TFEQ) is used to measure eating behaviors and patterns (Mazzeo et al., 2003). (See Appendix E). The TFEQ is the most widely used measure of eating behaviors and has been shown to be both valid and reliable in mixed gender populations of various age with both dieters and free eaters (Cappalleri et al., 2009; Bond et al., 2001; Ricciardeli & Williams, 1997; Stunkard & Messick, 1985). Stunkard and Messick (1985) developed this scale with three constructs examining restriction (TFEQRES) (21 items), disinhibition (TFEQDIS) (16 items) and hunger (TFEQHUNG) (14 items). The

first construct is restraint. Within the construct of restraint there are three subscales: strategic dieting behavior, attitude to self-regulation, and avoidance of fattening foods. The TFEQ items related to “strategic dieting behavior” are 6, 23, 28, and 48. A sample item in this subscale is question #6 which asks, “I deliberately take small helpings as a mean of controlling my weight.” Attitude to self-regulation is associated with questions 10, 21, 30, 32, and 37. A sample item in this subscale is, “I eat anything I want, any time I want.” The third subscale in the first construct is avoidance of fattening foods. The TFEQ questions associated with this subscale are 33, 42, 43, and 44. The nature of these questions asks, “How frequently do you avoid stocking up on tempting foods?”

The next construct that the TFEQ explores is disinhibition. This construct has three subscales as well: habitual susceptibility, emotional susceptibility and situational susceptibility. Habitual susceptibility to disinhibited eating relates to items 11, 36, 45, 49 and 51. This subscale is designed to focus on factors that may “predispose individuals to recurrent disinhibition.” A sample item in this subscale would be, “I start dieting in the morning, but because of any number of things that happen during the day, by evening I have given up and eat what I want, promising myself to start dieting again tomorrow.” The second subscale looks at emotional susceptibility to disinhibited eating and consists of items 9, 20 and 27. A sample of the questions linked to this subscale would be, “When I feel lonely, I console myself by eating.” The last subscale of this construct is situational susceptibility to disinhibited eating and is associated with items 2, 7, 13, 15 and 16. Situational susceptibility looks at the nature of questions such as, “When I am with someone who is overeating, I usually overeat too.”

The third construct of the TFEQ is hunger. This construct has two subscales: internal locus for hunger and external locus for hunger. Internal locus for hunger is related to items 3,5, 12,24, 34 and 39. This subscale aims to look at “hunger that is interpreted and regulated internally.” A sample question of this subscale would be, “Sometimes things just taste so good that I keep on eating even when I am no longer hungry.” The subscale for external locus is associated with items 8,19, 22, 26, 41 and 47. This subscale aims to “describe hunger triggered by external cues.” A sample question from the external locus subscale would be, “Being with someone who is eating often makes me hungry enough to eat also.”

The TFEQ uses both a Likert-type scale (1-4) and true/false questions to evaluate the constructs through 51 items. Of the 51 items, 36 are true/false (referred to as Part 1). The true/false questions have a value of 0 or 1 depending on the answer. Each question is specifically associated with one of the three constructs. Higher scores indicate higher levels of the three behavioral constructs of restraint, disinhibition, and hunger. The remaining 15 items are scored with a Likert-type scale ranging from 1 (rarely, not at all, only at mealtimes, never, almost never, easy, unlikely) to 4 (always, very much, almost always, very difficult, extremely, very likely, almost every day, at least once a week) (referred to as Part 2). The scoring for this section is done by splitting the responses at the middle (between 2 and 3), such that for items labeled with a “+1”, an answer of 3 or 4 is given a score of 1 (if the answer is 1 or 2, a score of 0 is given). Again, higher scores indicate higher levels of the three behavioral constructs of restraint, disinhibition, and hunger. Among a mixed group of dieters and free-eaters, reliabilities for the three

constructs of the TFEQ were established at 0.93 for restraint, 0.91 for disinhibition and 0.85 for hunger (Stunkard & Messick, 1985).

**Self- Compassion Scale (SCS).** The Self-Compassion Scale (SCS) is used to measure self-compassion (See Appendix F). Self compassion involves being open to one's own suffering and extending kindness toward oneself, bringing mindful awareness to one's experience, and recognizing that one's individual experience is also part of a common humanity (Neff, 2003a). The SCS is comprised of 6 subscales with a total of 26-items, therefore, the scale yields both a total score and 6 separate subscale scores (Neff, 2003a). The scale uses a 5-point Likert-type scale, 1-5 (0= almost never to 5= almost always). While the subscale scores are determined by adding the item scores, the total score is determined by reversing the 3 negative subscale items (isolation, self-judgment, over-identification) and then adding all 6 subscale scores together (Raes, Pommier, Neff, Van Gucht, 2011). A higher total self-compassion score indicates higher levels of self-compassion.

The subscales of the SCS are as follows: Self-Kindness (e.g. 'When I'm going through a very hard time, I give myself the caring and tenderness that I need'), Self-Judgment (e.g. 'When I see aspects of myself that I don't like, I get down on myself'), Common Humanity (e.g. 'When I feel inadequate in some way, I try to remind myself that feelings of inadequacy are shared by most people'), Isolation (e.g. 'When I'm feeling down I tend to feel like most other people are probably happier than I am'), Mindfulness (e.g. 'When I'm feeling down I try to approach my feelings with curiosity and openness'), and Over-Identification (e.g. 'When something painful happens I tend to blow the incident out of proportion') (Neff, 2003a). In the development of the SCS, strong reliability correlations

were established as follows: “ Self-Compassion Scale (overall score): .93; Kindness subscale: .88; Self-Judgment subscale: .88; Common Humanity subscale: .80; Isolation subscale: .85; Mindfulness subscale: .85; and Over-Identification subscale: .88” (Neff, 2003a).

### **Statistical Analysis**

The collected data were analyzed using SAS version 9.2 (SAS Institute Inc., Cary, NC). All data were checked visually for outliers and the distribution of the frequency histograms of each variable evaluated. Data were also checked for normality to ensure data distribution. Differences between sexes were explored for all variables using a t-test. Pearson product-moment correlation coefficients were used to indicate the size and direction of the relationship between the variables (Vincent, 2005). The mean data were expressed as the Mean +/- Standard Deviation (M +/- SD).

**Self-compassion and eating behaviors.** Correlations between the SCS total score and the TFEQ subscale scores, the 3 positive SCS subscales scores and the 3 TFEQ subscales scores, and the 3 negative SCS subscale scores and the 3 TFEQ subscale scores were analyzed for both males and females separately.

**Stress and eating behaviors.** Correlations between the PSS total score and the 3 subscale scores of the TFEQ were analyzed for both males and females separately..

**Perceived stress and self-compassion.** Correlations between perceived stress using the PSS, as a single score, and self-compassion, using the SCS as a single score were analyzed for both males and females separately.

## Chapter 4

### **Results**

This study used a cross-sectional design to explore the associations among stress, eating behaviors, and self-compassion in first-time college freshmen, both males and females. The data was collected through a web-based online survey at a large southwestern university.

#### **Data Cleaning**

The raw data total included 2029 respondents. The self-report answers were downloaded from the ClassApps survey system in verbal format and were recoded and organized into spreadsheet fields using Access Computer and Microsoft Office Excel 2003 programs. Data were cleaned for missing or incomplete entries. Additionally, data were examined for any physiologically extreme height and weight data points. Once the data was cleaned, the total  $n = 1478$ ; females = 936, males = 541.



## Demographic Characteristics

Mean data for all demographic variables are included in Table 1.

Table 1

*Demographic Characteristics of Population (n= 1478)*

Characteristic	Total Sample (n= 1478) N (%)	Males (n= 541) n (%)	Females (n= 936) n (%)
<b>Age</b>			
18 years	1200 (81.2)	420 (77.63)	779 (83.23)
19 years	252 (17.1)	107 (19.78)	145 (15.49)
20 years	14 (.01)	5 (0.92)	9 (0.96)
21- 22 years	12 (.01)	9 (1.66)	3 (0.32)
<b>BMI</b>			
Underweight	56 (3.9)	14 (2.63)	42 (4.56)
Normal	1019 (70)	340 (63.79)	678 (73.62)
Overweight	287 (19.4)	129 (24.20)	158 (17.16)
Obese	93 (.06)	50 (9.38)	43 (4.67)
<b>Ethnicity</b>			
European	664 (44.93)	280 (51.76)	383 (40.92)
African or North African	40 (2.71)	16 (2.96)	24 (2.56)
Asian or South Asian or Pacific Islander	97 (6.56)	48 (8.87)	49 (5.24)
Latino/a or Hispanic	232 (15.70)	65 (12.01)	167 (17.84)
Middle Eastern	20 (1.35)	10 (1.85)	10 (1.07)
Native American	25 (1.69)	11 (2.03)	14 (1.50)
Other or Multi ethnic	400 (27.06)	111 (20.52)	289 (30.88)

**Age and Gender.** The majority of the study participants were 18 years of age; 83% of the females and 81% of the males were 18. Sixty-four percent of the participants were female and 36% were male.

**BMI.** Based on the self-reported height and weight, nearly three-fourths of the female population and two-thirds of the male population had a calculated BMI that fell within the normal range. Five percent of the females were underweight, 17% were overweight, and 5% were obese. For the male population, 3% were classified as underweight, 24% were overweight, and 9% were obese. All BMI calculations were categorically classified per ACSM guidelines (Pescatello, L.S., Arena, R., Riebe, D., & Thompson, 2014).

**Ethnicity.** Respondents identified themselves ethnically as one of the following: European, African or North African, Asian or South Asian or Pacific Islander, Latino/a or Hispanic, Middle Eastern, Native American, or Other or Multi ethnic. The majority of the female population identified themselves as European (41%) or other or multi ethnic (31%). A similar distribution was observed in the male population with 52% European and 21% other or multi ethnic.

## Comparative Analysis Between Genders

Differences between males and females on all outcome variables are shown in Table 2. Females reported a significantly lower BMI compared with males ( $p < .0001$ ). Females had reported a lower total SCS ( $p = .0050$ ) and higher scores on the SCS Self-Judgment ( $p = .0018$ ), SCS Isolation ( $p = .0153$ ), and SCS Over-Identification ( $p < .0001$ ) subscale compared with males. Additionally, females scored significantly higher on the TFEQ Restraint ( $p < .0001$ ) and Disinhibition subscales ( $p < .0001$ ).

Table 2

### *Comparative Analysis of Variables By Gender*

Variable	Males (n = 541)	Females (n = 936)	p Value
Age	18.3 +/- 0.6	18.2 +/- 0.5	.0031
BMI	24.1 +/- 4.4	22.6 +/- 3.9	<.0001*
PSS	20.8 +/- 4.0	22.2 +/- 4.1	<.0001*
SCS Total Score	3.0 +/- 0.6	2.9 +/- 0.6	.0050*
SCS Self-Kindness	2.8 +/- 0.8	2.8 +/- 0.8	.3740
SCS Mindfulness	3.2 +/- 0.7	3.1 +/- 0.7	.0972
SCS Common Humanity	2.9 +/- 0.8	3.1 +/- 0.8	.1158
SCS Self-Judgment	3.0 +/- 0.9	3.2 +/- 0.9	.0018*
SCS Over- Identification	2.8 +/- 0.9	3.1 +/- 0.9	<.0001*
SCS Isolation	3.0 +/- 0.9	3.1 +/- 0.9	.0153*
TFEQ 1 Restraint	7.5 +/- 4.7	9.9 +/- 5.4	<.0001*
TFEQ 2 Disinhibition	4.0 +/- 2.8	5.5 +/- 3.5	<.0001*
TFEQ 3 Hunger	5.7 +/- 3.4	5.8 +/- 3.5	.6781

*Note:* PSS = Perceived Stress Scale; SCS = Self Compassion Scale; TFEQ = Three Factor Eating Questionnaire.

\*Indicates significant and relevant differences between males and females

## **Correlational Analysis**

Pearson Product Moment Correlational Matrices were created for each of the outcome variables (self-compassion, eating behaviors, stress) with respect to all identified aims and hypotheses. Given the significant differences found between males and females in many of the outcome variables, correlational analyses presented below are for males and females separately.

### **Association between overall self-compassion and 3 constructs of eating behaviors.**

Table 3 demonstrates weak but significant associations between SCS total score and the TFEQ 1 (restraint) and TFEQ 2 (hunger) subscale scores in females, as SCS total increased, TFEQ 1 and TFEQ 2 decreased. Table 3 illustrates the strongest correlation between SCS total score and TFEQ 1 (disinhibition) in females ( $r = -0.27$ ;  $p = <.0001$ ); as SCS total score increased, disinhibition decreased. Table 4 illustrates weak but significant associations between SCS total score and TFEQ 2 (disinhibition) and TFEQ 3 (hunger) subscale scores in males, as SCS total increased, TFEQ 2 and TFEQ 3 decreased. There was no association between the SCS total score and the TFEQ 1 (restraint) subscale score in males (see Table 4).

TABLE 3

*Correlations between SCS Total Score and TFEQ in Females (n = 936)*

	SCS	TFEQ 1 Restraint	TFEQ 2 Disinhibition	TFEQ 3 Hunger
SCS Total	1.0	-0.10 p= 0.001	-0.27 p= <.0001	-0.14 p= <.0001
TFEQ 1 Restraint		1.0	0.14 p= <.0001	-0.09 p= 0.01
TFEQ 2 Disinhibition			1.0	0.58 p= <.0001
TFEQ 3 Hunger				1.0

*Note:* SCS Total = Self-Compassion Scale Total Score; TFEQ = Three Factor Eating Questionnaire

TABLE 4

*Correlations between SCS Total Score and TFEQ in Males (n = 541)*

	SCS Total	TFEQ 1 Restraint	TFEQ 2 Disinhibition	TFEQ 3 Hunger
SCS Total	1.0	-0.01 p= 0.88	-0.16 p= 0.0002	-0.12 p= 0.01
TFEQ 1 Restraint		1.0	0.12 p= 0.004	-0.04 p= 0.33
TFEQ 2 Disinhibition			1.0	0.55 p= <.0001
TFEQ 3 Hunger				1.0

*Note:* SCS Total = Self-Compassion Scale Total Score; TFEQ = Three Factor Eating Questionnaire

**Associations among the 3 positive constructs of self-compassion and the 3 constructs of eating behaviors.** There was a weak but significant association between the positive SCS subscales of self-kindness and mindfulness and TFEQ 2 (disinhibition) in females ( $r = -0.15$ ;  $p = <.0001$ ;  $r = -0.13$ ;  $p = <.0001$ ), as self-kindness and mindfulness increased, disinhibition decreased (see Table 5). There was a weak but significant association between the positive SCS subscale of mindfulness and TFEQ 2 (disinhibition) in males ( $r = -.11$ ;  $p = 0.01$ ), as mindfulness increased, disinhibition decreased (see Table 6). Tables 5 and 6 demonstrate that there were no associations between the 3 positive constructs of self-compassion (self-kindness, common humanity, mindfulness) and TFEQ 1 (restraint), TFEQ 3 (hunger) in females or males.

TABLE 5

*Correlations between 3 Positive SC Constructs and TFEQ in Females (n = 936)*

	SCS Self-Kindness	SCS Common Humanity	SCS Mindfulness	TFEQ 1 Restraint	TFEQ 2 Disinhibition	TFEQ 3 Hunger
SCS Self-Kindness	1.0	0.54 $p = <.0001$	0.66 $p = <.0001$	-0.06 $p = 0.06$	-0.15 $p = <.0001$	-0.06 $p = 0.09$
SCS Common Humanity		1.0	0.63 $p = <.0001$	0.06 $p = 0.06$	-0.05 $p = 0.13$	0.001 $p = 0.98$
SCS Mindfulness			1.0	0.04 $p = 0.26$	-0.13 $p = <.0001$	-0.05 $p = 0.12$
TFEQ 1 Restraint				1.0	0.14 $p = <.0001$	-0.09 $p = 0.01$
TFEQ 2 Disinhibition					1.0	0.58 $p = <.0001$
TFEQ 3 Hunger						1.0

*Note:* SCS = Self-Compassion Scale; TFEQ = Three Factor Eating Questionnaire

TABLE 6

*Correlations between 3 Positive Constructs of SC and TFEQ in Males (n = 541)*

	SCS Self-Kindness	SCS Common Humanity	SCS Mindfulness	TFEQ 1 Restraint	TFEQ 2 Disinhibition	TFEQ 3 Hunger
SCS Self-Kindness	1.0	0.48 p= <.0001	0.56 p= <.0001	.003 p= 0.93	-0.03 p= 0.56	-0.03 p= 0.51
SCS Common Humanity		1.0	0.51 p= <.0001	0.09 p= 0.05	-0.04 p= 0.41	-0.02 p= 0.68
SCS Mindfulness			1.0	0.06 p= .18	-0.11 p= 0.01	-0.08 p= 0.07
TFEQ 1 Restraint				1.0	0.12 p= 0.004	-0.04 p= 0.33
TFEQ 2 Disinhibition					1.0	0.55 p= <.0001
TFEQ 3 Hunger						1.0

*Note:* SCS = Self-Compassion Scale; TFEQ = Three Factor Eating Questionnaire

**Associations among the 3 negative constructs of self-compassion and the 3 constructs of eating behaviors.**

**Females.** Table 7 illustrates the associations among the negative constructs of self-compassion and eating behaviors in females. Weak but significant associations were found in females between 2 of the negative constructs of self-compassion and TFEQ 1 (restraint); isolation ( $r = 0.12$ ;  $p = 0.0002$ ) and over-identification ( $r = 0.10$ ;  $p = 0.0003$ ). As isolation and over-identification increased, so did the eating behavior of restraint in females. A stronger and more significant association was found between the negative construct of self-judgment and TFEQ 1 (restraint) in females ( $r = 0.26$ ;  $p = <.0001$ ); as self-judgment increased so did the eating behavior of restraint. Stronger and significant associations were found between all 3 negative self-compassion constructs and TFEQ 2 (disinhibition) in females: self-judgment ( $r = 0.29$ ;  $p = <.0001$ ), isolation ( $r = 0.23$ ;  $p = <.0001$ ), and over-identification ( $r = 0.28$ ;  $p = <.0001$ ). As self-judgment, isolation and over-identification increased so did the eating behavior of disinhibition in females. These correlations were the strongest among all explored matrices with respect to self-compassion (total score and as subscales) and eating behaviors. Weak but significant associations were found in females between all 3 negative constructs of self-compassion and the TFEQ 3 (hunger) in females: self-judgment ( $r = 0.15$ ;  $p = <.0001$ ), isolation ( $r = 0.16$ ;  $p = <.0001$ ), and over-identification ( $r = 0.16$ ;  $p = <.0001$ ); as self-judgment, isolation, and over-identification increased in females, so did hunger.

**Males.** Table 8 illustrates the associations among the negative constructs of self-compassion and eating behaviors in males. Weak but significant associations were found in males between 2 of the negative self-compassion constructs and TFEQ 2



(disinhibition) in males: self-judgment ( $r = -0.15$ ;  $p = <.0001$ ) and over-identification ( $r = -0.13$ ;  $p = <.0001$ ). As self-judgment and over-identification increased in males, so did the eating behavior of disinhibition; however, no association existed with isolation. No associations were found in the male population between TFEQ 1 (restraint), TFEQ 3 (hunger) and any of the 3 negative self-compassion constructs.

TABLE 7

*Correlations between 3 Negative Constructs of SC and TFEQ in Females (n = 936)*

	SCS Self-Judgment	SCS Isolation	SCS Over-Identification	TFEQ 1 Restraint	TFEQ 2 Disinhibition	TFEQ 3 Hunger
SCS Self-Judgment	1.0	0.72 $p = <.0001$	0.71 $p = <.0001$	0.26 $p = <.0001$	.29 $p = <.0001$	.15 $p = <.0001$
SCS Isolation		1.0	0.71 $p = <.0001$	0.12 $p = 0.0002$	.23 $p = <.0001$	0.16 $p = <.0001$
SCS Over-Identification			1.0	0.10 $p = 0.003$	.28 $p = <.0001$	0.16 $p = <.0001$
TFEQ 1 Restraint				1.0	0.14 $p = <.0001$	-0.09 $p = 0.005$
TFEQ 2 Disinhibition					1.0	0.58 $p = <.0001$
TFEQ 3 Hunger						1.0

*Note:* SCS = Self-Compassion Scale; TFEQ = Three Factor Eating Questionnaire

TABLE 8

*Correlations between 3 Negative Constructs of SC and TFEQ in Males (n = 541)*

	SCS Self-Judgment	SCS Isolation	SCS Over-Identification	TFEQ 1 Restraint	TFEQ 2 Disinhibition	TFEQ 3 Hunger
SCS Self-Judgment	1.0	0.54 p= <.0001	0.66 p= <.0001	-0.06 p= 0.06	-0.15 p= <.0001	-0.06 p= 0.09
SCS Isolation		1.0	0.63 p= <.0001	0.06 p= 0.06	-0.05 p= 0.13	0.001 p= 0.98
SCS Over-Identification			1.0	0.04 p= 0.26	-0.13 p= <.0001	-0.05 p= 0.12
TFEQ 1 Restraint				1.0	0.14 p= <.0001	-0.09 p= 0.01
TFEQ 2 Disinhibition					1.0	0.58 p= <.0001
TFEQ 3 Hunger						1.0

*Note:* SCS = Self-Compassion Scale; TFEQ = Three Factor Eating Questionnaire

**Association between stress and overall self-compassion scores.** Moderately strong and significant associations were found between overall self-compassion scores and stress in both females ( $r = -0.28$ ;  $p = <.0001$ ) (see Table 9) and males ( $r = -0.25$ ;  $p = <.0001$ ) (see Table 10). As total self-compassion scores increased, perceived stress decreased in both females and males.

TABLE 9

*Correlations between Stress and SCS Total in Females (n = 936)*

	SCS Total	PSS Total
SCS Total	1.00	-0.28 p= <.0001
PSS		1.00

*Note:* SCS Total = Self-Compassion Scale Total Score; PSS = Perceived Stress Scale

TABLE 10

*Correlations between Stress and SCS Total in Males (n = 541)*

	SCS Total	PSS Total
SCS Total	1.00	-0.25 p= <.0001
PSS		1.00

*Note:* SCS Total = Self-Compassion Scale Total Score; PSS = Perceived Stress Scale

**Association between stress and 3 constructs of eating behaviors.** Weak but significant associations were found between stress and all three eating behaviors in females: TFEQ 1 restraint, ( $r = 0.12$ ;  $p = 0.0002$ ), TFEQ 2 disinhibition, ( $r = 0.17$ ;  $p = <.0001$ ), and TFEQ 3 hunger, ( $r = 0.18$ ;  $p = <.0001$ ) (see Table 11). As stress increased in females so did the three eating behaviors of restraint, disinhibition, and hunger. No associations were found between the perceived stress and the three eating behaviors in males (see Table 12).

TABLE 11

*Correlations between Stress and TFEQ in Females (n = 936)*

	PSS	TFEQ 1 Restraint	TFEQ 2 Disinhibition	TFEQ 3 Hunger
PSS	1.0	0.12 $p = 0.0002$	0.17 $p = <.0001$	0.18 $p = <.0001$
TFEQ 1 Restraint		1.0	0.14 $p = <.0001$	-0.09 $p = 0.01$
TFEQ 2 Disinhibition			1.0	0.58 $p = <.0001$
TFEQ 3 Hunger				1.0

*Note:* PSS = Perceived Stress Scale; TFEQ = Three-Factor Eating Questionnaire

TABLE 12

*Correlations between Stress and TFEQ in Males (n = 541)*

	PSS	TFEQ 1 Restraint	TFEQ 2 Disinhibition	TFEQ 3 Hunger
PSS	1.0	0.08 p = 0.06	-0.003 p = 0.94	0.04 p = 0.33
TFEQ 1 Restraint		1.0	0.12 p = 0.004	-0.04 p = 0.33
TFEQ 2 Disinhibition			1.0	0.55 p = <.0001
TFEQ 3 Hunger				1.0

*Note:* PSS = Perceived Stress Scale; TFEQ = Three-Factor Eating Questionnaire

## Chapter 5

### Discussion

Research has clearly established the significance of the sensitive period of transition to the university and its associated psychological and behavioral outcomes (Bray & Born, 2004). First time college freshmen are especially prone to stress due to “varying academic commitments, financial pressures, and lack of time management skills” (Von Ah et al., 2004, p. 465). Additionally, students experience stress because there is a disruption in well-established routines, habits, living situations and the security and predictability they may have been used to which are no longer prevalent (Bray & Born, 2004). It is fully recognized that the university transition “provides students with many opportunities for growth” while at the same time potentially creating “serious psychological distress” (Sasaki & Yamasaki, 2007, p. 51). The prominent concern about the stressful dynamics of the university transition, although a relatively short period of time, is how students cope with the experienced stress and the potential lasting impact these developed coping strategies may have on health across the lifespan.

The concept of coping is defined as “cognitive and behavioral attempts to alter events or circumstances that are threatening” (Dyson & Renk, 2006, p. 1233). It is well accepted that in relation to stress, college students often engage in risky or unsafe health related behaviors (Bray & Born, 2004; Von Ah et al., 2004). Specifically, these risky behaviors are identified as possibly including “alcohol use, tobacco use, physical inactivity, and unhealthy dietary practices, ignore preventive safety habits such as wearing helmets, seat belts and/or condoms and engage in excessive sun exposure” (Von Ah et al., 2004, p. 464). These types of behaviors can be viewed as coping mechanisms

or strategies for dealing with the adaptation to new stressors (Dyson & Renk, 2006.) Without appropriate knowledge, education, and resources, students may develop maladaptive coping skills that could have lasting implications regarding physical and psychological health (Dyson & Renk, 2004; Von Ah et al., 2004). Specific to this study is the further exploration of eating behaviors in response to stress. It has been noted that “college seems to be rife with psychological and environmental stressors that put students at risk for developing eating disorders” (Berg et al., 2009, p. 141).

The primary focus of this study was to explore the relationships among stress, eating behaviors, and self-compassion in first time college freshmen. The values of our correlations were consistent with the existing literature with respect to all variables. The strongest correlation was found between the eating behavior of disinhibition (TFEQ 2) and the self-compassion construct of self-judgment in females ( $r = .29$ ); as disinhibition increased, self-judgment decreased. Further, the eating behavior of disinhibition (TFEQ 2) had consistently moderate associations with all three negative constructs of self-compassion in females (self-judgment:  $r = .29$ ; isolation:  $r = .23$ ; over-identification:  $r = .28$ ). As the eating behavior of disinhibition increased, the self-compassion subscales of self-judgment, isolation, and over-identification increased in females. The total score for self-compassion (SCS Total) and the eating behavior of disinhibition in females had a correlation similar in strength ( $r = -.27$ ), such that as total self-compassion increased, the eating behavior of disinhibition decreased. While not as strong, results also indicated an association between perceived stress (PSS) and the eating behaviors of disinhibition ( $r = .17$ ) and hunger ( $r = .18$ ) in females, as stress increased so did the eating behaviors or disinhibition and hunger. Consistent with literature, these findings were indicative of

greater abnormal eating behaviors in females as compared to males. “There may be a gender-specific response to stress in which women are more likely to use food to deal with stress” (Torres & Nowson, 2007, p. 890). It is a well-established premise that dieting behaviors and eating disorders are far more prevalent in the female population; further, it is accepted that the traditional college age is a “peak time” for the development of maladaptive eating in this population (Berg et al., 2009, p. 137).

Recent research on disinhibition supports the importance of the above findings and justifies further exploration and understanding of the role disinhibited eating plays in response to stress and perception of self. Disinhibition has been positively correlated with weight gain in adults (Hays & Roberts, 2008; Bond et al., 2001). “Neither restraint nor hunger has been consistently associated with BMI or weight change, in contrast to the strong associations reported for disinhibition” (Hays & Roberts, 2008, p. 52). Hays and Roberts (2008) found the subscale of habitual disinhibition to be the strongest correlate of weight gain; this finding is logical given that the habitual consumption of excessive calories in a frequent and continuous manner may play a role in energy imbalance. The association between disinhibition and weight gain was first established based on the findings of the original TFEQ study; increased disinhibition scores were correlated with greater weight gain specific to the experience of depression (Stunkard & Messick, 1985). It was further found the disinhibition was strongly correlated with restraint (Stunkard & Messick, 1985).

The eating behaviors of restraint and disinhibition are frequently explored together with results indicating that restraint often leads to disinhibition. Restraint and disinhibition are robust in the context of self-judgment or self-criticism (Adams & Leary,



2007). Adams and Leary (2007) state: “people who attempt to control their eating are most likely to become disinhibited when facing unpleasant thoughts and feelings about themselves” (p. 1122). The correlations in this study between restraint (TFEQ 1) and self-judgment in females ( $r = .26$ ) and disinhibition (TFEQ 2) and self-judgment in females ( $r = .29$ ) are consistent with existing literature. These correlations may be partially explained by the idea that, especially with regards to dieters, when one feels judgmental or critical of themselves, they are less likely to be aware of and utilize appropriate coping resources and may therefore engage in such maladaptive behaviors as overeating or disinhibiting eating. “Research suggests that dieters are especially prone to overeat in response to negative emotional states or aversive self-awareness” (Adams & Leary, 2007, p. 1122).

The negative emotions associated with disinhibited eating could logically extend beyond self-judgment to include the behavioral constructs of isolation and over-identification as were also seen in this study (disinhibition and isolation,  $r = .23$ ; disinhibition and over-identification,  $r = .28$ ). Both isolation and over-identification could factor into lack of self-awareness and inability to resource appropriate coping skills.

In the context of eating behaviors, self-judgment, isolation, and over-identification are important to understand because they link directly to self-esteem. Literature defines self-esteem as “the judgment of one’s own worth” (Ruggiero, Bertelli, Boxxalari, Certorame, Ditucci, Mela, Scarinci, Vinai, Scarone, & Sassaroli, 2008, p. 143). Low self-esteem and high perfectionism (seen as being self-critical coupled with anxiety, high standards, and the drive to meet others expectations) “are two of the most frequently observed risk

factors in the development of common eating disorders (EDs), such as anorexia nervosa, bulimia nervosa, and even maladaptive eating attitudes in non-clinical individuals” (Ruggiero et al., 2008, p. 142). Furthermore, individuals with eating disorders typically have “long-standing negative self-evaluation” (Ruggiero et al., 2008, p.143).

Understanding the predictive factors of eating disorders and maladaptive eating behaviors is critical to both intervention and prevention. In this study exploring the psychological subscales within the SCS provided a deeper understanding of the necessary direction of future work to best support individuals challenged by these particular issues that may have impact on life-long health.

Research over the past decade has clearly established a strong and consistent correlation between self-compassion and adaptive psychological functioning (Neff, 2011). More recently, Adams and Leary (2007) noted that “people who treat themselves with compassion when they overeat might be more successful at regulating their eating because they are less motivated to eat in order to cope with negative self-feelings...these people might be able to remain aware of their goals for healthy eating because they have a “clear head” that is not cluttered with unpleasant thoughts and feelings” (p. 1140). It is important to further understand the correlation between disinhibition and self-judgment, and the potential role that self-compassion may play in this relationship.

“Self-compassion may be a valuable coping resource when people experience negative life events. People who are self-compassionate are less likely to catastrophize negative situations, experience anxiety following a stressor, and avoid challenging tasks for fear of failure” (Allen & Leary, 2010, p. 115). It is well established that higher self-compassion scores are negatively associated with many psychological factors; with

respect to this study, it is important to note that this holds true for self-criticism (Neff et al., 2007). The opposite is true as well such that people higher in self-criticism or self-judgment have lower overall self-compassion scores. The concept of self-compassion can be seen as an alternative coping strategy which can promote and enhance psychological functioning and well-being (Allen & Leary, 2010).

Negative and moderately strong correlations were found between perceived stress (PSS) and self-compassion total score (SCS Total) in both females ( $r = -.28$ ) and males ( $r = -.25$ ) in this study. Although not quite as strong, these findings are consistent with the direction of the existing literature substantiating the relationship between stress related outcomes and self-compassion (Allen & Leary, 2010; Neff & McGehee, 2010; Neff, Kirkpatrick, & Rude, 2007). Additionally, there were significant differences between males and females ( $p = <.0001$ ) in stress scores, a finding consistent with the literature on this age population (Cohen & Janicki-Denvers, 2010; Economos et al., 2008; Zaleski et al., 1998). However, in contrast to females, there were no significant associations between stress (PSS) and restraint, disinhibition, or hunger in males. While it is possible that the TFEQ was not salient for males participants in this study, these findings suggest that interventions focused on increasing self-compassion and reducing stress as a strategy for impacting maladaptive eating in college freshmen are perhaps more important for females.

All other correlations between measures of stress, self-compassion, and eating behaviors were weak in both females and males. A limitation of this study and findings were that all measures were self-report questionnaires and all data was only collected one time from one university. Given the clear differences in the strength of the associations

between the positive constructs of self-compassion and eating behaviors and the negative constructs of self-compassion and eating behaviors, it is possible that the language and items associated with the positive SCS constructs are not as easily comprehended or as resonant as the negative SCS items in a college freshmen population.

The results of this study also demonstrate the need to explore more deeply the role of stress and self-compassion on health behaviors in males. While this research is consistent with the risks of maladaptive eating in females, this study raises the question of whether the significant differences in stress and negative SCS constructs between males and females are critical factors in behavioral outcomes in this population and whether males are more likely to engage in other types of coping behaviors, both adaptive (e.g., physical activity) or maladaptive (e.g., alcohol use). Additionally, to build on existing literature and more fully understand the mechanisms underlying the correlations that were found among stress, self-compassion, and eating behaviors in females in this study, it is recommended that future research focus more specifically on the subscales of disinhibition rather than the total disinhibition score only. Identifying the potential associations among stress, self-compassion, and emotional disinhibition, situational disinhibition, and habitual disinhibition may provide more depth of understanding of the role of stress and self-compassion in types of disinhibited eating. More research is needed to better understand how self-compassion may ameliorate the existing relationship between specific eating behaviors (restraint and disinhibition) and negative psychological constructs. The development and application of the foundational core skills of self-compassion may offer the kinds of positive coping strategies and a better

means of relating to oneself that can play a role in reducing stress and the risks of maladaptive eating in female college freshmen.

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APPENDIX A  
RECRUITMENT LETTER

Message sent on behalf of the Department of Exercise and Wellness at Arizona State University.

## STRESS AND HEALTH BEHAVIORS RESEARCH

### Participants Wanted for Stress and Health Behaviors Study in College Freshmen

The Department of Exercise and Wellness invites you to participate in an online survey about stress and health behaviors in college freshmen.

Completing the survey takes approximately 20-30 minutes, and you must be an ASU Freshman, 18-22 years old, to participate.

As a participant, you can enter into a random drawing for \$100 ASU Sun Dollars which will be given to TWENTY participants who complete the survey!

Completed surveys must be received by midnight (12:00 a.m.) on  
Wednesday, November 7, 2007

If you are interested, please follow the link below to complete the survey.

#Survey Link Provided Here#

Thank you for your participation and support of research at Arizona State University!

Note: Before submitting your survey, you will be given the opportunity to submit your email address and 10-digit ASU Affiliate ID number in order to be entered into the random drawing for \$100 Sun Dollars. Your email address and ID# will be immediately stored separately from the survey data to maintain your anonymity. Winners will be notified by email after all data are collected.

This study is being conducted by graduate students Teresa E. Araas and Larua J. Rooney, under the direction of Dr. Pamela D. Swan, Associate Professor, and Dr. Ann Sebren, Lecturer, all in the Department of Exercise and Wellness at Arizona State University

APPENDIX B  
INFORMED CONSENT

## Informed Consent Notice at the Beginning of the Survey

We are conducting a research study to examine the relationship of mindfulness, self-efficacy, and perceived stress levels in relation to both specific health-related behaviors and general indicators of physical and mental health. We are inviting your participation, which will involve completing and submitting the accompanying online survey. This will take approximately 20-30 minutes of your time.

Your participation in this study is voluntary, but you must be 18-22 years of age to be able to participate in this study. If you choose not to participate or to withdraw from the study at any time, there will be no penalty.

Possible benefits of your participation are helping researchers better understand associations among mindfulness, perceived stress levels and health behaviors, as well as identify relationships between mindfulness and self-efficacy. Outcomes may include enhanced programs and educational opportunities to help students make healthier lifestyle decisions. There are no foreseeable risks or discomforts to your participation.

All information obtained in this study is strictly confidential unless disclosure is required by law. The results of this research study may be used in reports, presentations, and publications, but the surveys are anonymous and researchers will not identify you. In order to maintain confidentiality, all data will be identified only with a study-generated ID number. Submission of the online questionnaire will be considered your consent to participate in this study.

If you have any questions concerning the research study, please contact the research team at: Dr. Pamela D. Swan (480)-727-1934 or Teresa E. Araas at (480)-727-1945. If you have any questions about your rights as a participant in this research, or if you feel

you have been placed at risk, you can contact the Chair of the Human Subjects Institutional Review Board, through the ASU Research Compliance Office, at (480)-965-6788.

#### Informed Consent Notice at the End of the Survey

Thank you for participating in this survey!

This study is being conducted by graduate students Teresa E. Araas and Laura J. Rooney, under the direction of Dr. Pamela D. Swan, Associate Professor, and Dr. Ann Sebren, Lecturer, both in the department of Exercise and Wellness at Arizona State University. If you have any questions concerning the research study, please contact the research team at: Dr. Pamela D. Swan, (480)-727-1934, or Teresa E. Araas, (480)-727-1945. If you have any questions about your rights as a participant in this research, or if you feel you have been placed at risk, you can contact the Chair of the Human Subjects Institutional Review Board, through the ASU Research Compliance Office, at (480)-965-6788.

Submission of this web-based questionnaire will be considered your consent to participate in this study.



APPENDIX C  
DEMOGRAPHICS

How old are you? \_\_\_\_\_

What is your sex?

What is your height in feet and inches? \_\_\_\_\_ Feet \_\_\_\_\_ Inches

What is your weight in pounds? \_\_\_\_\_ Pounds

Are you a full-time student at Arizona State University?

Are you enrolled in classes at another academic institution?

How do you usually describe your ethnic descent?

African \_\_\_\_

Asian \_\_\_\_

European \_\_\_\_

Hispanic \_\_\_\_

Latino/a \_\_\_\_

Middle Eastern \_\_\_\_

Native American \_\_\_\_

North African \_\_\_\_

Pacific Islander \_\_\_\_

South Asian \_\_\_\_

Multi-Ethnic \_\_\_\_

Other \_\_\_\_

What is your current relationship status?

Single \_\_\_\_

Committed relationship (not living together) \_\_\_\_

Living together \_\_\_\_

Domestic partnership \_\_\_\_

Engaged to be married \_\_\_\_

Married \_\_\_\_

Separated \_\_\_\_

Divorced \_\_\_\_

Widowed \_\_\_\_

Where do you currently live?

Apartment off campus, live alone \_\_\_\_  
Apartment off campus, live with other(s) \_\_\_\_  
On-campus housing, live alone \_\_\_\_  
On-campus housing live with other(s) \_\_\_\_  
Live with parents at home \_\_\_\_  
Other \_\_\_\_

How many hours a week do you work for pay? \_\_\_\_\_

How many hours a week do you volunteer? \_\_\_\_\_

Are you originally from Arizona or from another state or country?

Arizona \_\_\_\_\_ At different state \_\_\_\_\_ A different country (not U.S.) \_\_\_\_\_

What is your religious affiliation, if any? \_\_\_\_\_

Which is your primary campus? (Where do you spend most of your time?)

Downtown campus \_\_\_\_ Polytechnic campus \_\_\_\_ Tempe campus \_\_\_\_ West campus \_\_\_\_

APPENDIX D

PERCEIVED STRESS SCALE (PSS)

The question in this scale ask you about your feelings and thoughts **during the last month**. In each case, you will be asked to indicate by circling *how often* you felt or thought a certain way.

Age:

Gender:

0= Never 1= Almost Never 2= Sometimes 3= Fairly Often 4= Very Often

1. In the last month, how often have you been upset because of something that happened unexpectedly?
2. In the last month, how often have you felt that you were unable to control the important things in your life?
3. In the last month, how often have you felt nervous or “stressed”?
4. In the last month, how often have you felt confident about your ability to handle your personal problems?
5. In the last month, how often have you felt that things were going your way?
6. In the last month, how often have you found that you could not cope with all the things that you had to do?
7. In the last month, how often have you been able to control irritations in your life?
8. In the last month, how often have you felt that you were on top of things?
9. In the last month, how often have you been angered because of things that were outside of your control?
10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?

APPENDIX E

THREE-FACTOR EATING QUESTIONNAIRE (TFEQ)

Indicate whether each of the following statements is typically true or false for you:

True      False

I usually eat too much at social occasions, like parties or picnics.

I am usually so hungry that I eat more than three times a day.

Dieting is so hard for me because I just get too hungry.

I deliberately take small helpings as a means of controlling my weight.

Sometimes things just taste so good that I keep on eating even when I am no longer hungry.

When I feel anxious, I find myself eating.

Life is too short to worry about dieting.

Since I am often hungry, I sometimes wish that while I am eating, an expert would tell me that I have had enough or that I can have something more to eat.

Since my weight goes up and down, I have gone on reducing diets more than once.

I often feel so hungry that I just have to eat something.

When I am with someone who is overeating, I usually overeat too.

I have a pretty good idea of calories in common food.

Sometimes when I start eating, I just can't seem to stop.

It is not difficult for me to leave something on my plate.

At certain times of day, I get hungry because I have gotten used to eating then.

While on a diet, if I eat food that is not allowed, I consciously eat less for a period of time to make up for it.

Being with someone who is eating often makes me hungry enough to eat also.

True

False

When I feel blue, I often overeat.

I enjoy eating too much to spoil it by counting calories or watching my weight.

When I see a real delicacy, I often get so hungry that I have to eat right away.

I often stop eating when I am not really full as a conscious means of limiting the amount of food I eat.

I get so hungry that my stomach often seem like a bottomless pit.

I am always hungry so it is hard for me to stop eating before I finish the food on my plate.

When I feel lonely, I console myself by eating.

I consciously hold back at meals in order not to gain weight.

I eat anything I want, any time I want.

Without even thinking about it, I take a long time to eat.

I count calories as a conscious means of controlling my weight.

I do not eat some foods because they make me fat.

I am always hungry enough to eat any time.

I pay a great deal of attention to changes in my figure.

While on a diet, if I eat a food that is not allowed, I often then splurge and eat other high calorie foods.

How often are you dieting in a conscious effort to control your weight?

1-rarely 2-sometimes 3-usually 4-always



Would a weight fluctuation of 5 pounds affect the way you live your life?

1-rarely 2-sometimes 3-moderately 4-very much

How often do you feel hungry?

1-only at mealtimes 2-sometimes between meals 3-often between meals  
4-almost always

Do your feeling of guilt about overeating help you to control your food intake?

1-never 2-rarely 3-often 4-always

How difficult would it be for you to stop eating halfway through dinner and not eat for the next four hours?

1-easy 2-slightly difficult 3-moderately difficult 4-very difficult

How conscious are you of what you are eating?

1-not at all 2-slightly 3-moderately 4-extremely

How frequently do you avoid “stocking up” on tempting foods?

1-almost never 2-seldom 3-usually 4-almost always

How likely are you to shop for low calorie foods?

1-unlikely 2-slightly likely 3-moderately likely 4-very likely

Do you eat sensibly in front of others and splurge alone?

1-never 2-rarely 3-often 4-always

How likely are you to consciously eat slowly in order to cut down on how much you eat?

1-unlikely 2-slightly likely 3-moderately likely 4-very likely

Do you go on eating binges even though you are not hungry?

1-never 2-rarely 3-sometimes 4-at least once per week

To what extent does this statement describe your eating behavior? “ I start dieting in the morning, but because of any number of things that happen during the day, by evening I have given up and eat what I want, promising myself to start dieting again tomorrow.”

1-not like me 2-little like me 3-pretty good description of me  
4-describes me perfectly

On a scale of 0-5 where 0 means no restraint in eating (eating whatever you want, whenever you want it) and 5 means total restraint (constantly limiting food intake and never giving in), what number would you give yourself?

0-eat whatever you want, whenever you want it  
2-usually eat whatever you want, whenever you want it  
3-often limit food intake, or often give in  
4-usually limit food intake, rarely give in  
5-constantly limit food intake, never give in

APPENDIX F  
SELF-COMPASSION SCALE (SCS)

## HOW I TYPICALLY ACT TOWARDS MYSELF IN DIFFICULT TIMES

Please read each statement carefully before answering. To the left of each item, indicate how often you behave in the stated manner, using the following scale:

**Almost**

**never**

**1**

**2**

**3**

**4**

**Almost**

**always**

**5**

- \_\_\_\_\_ 1. I'm disapproving and judgmental about my own flaws and inadequacies.
- \_\_\_\_\_ 2. When I'm feeling down I tend to obsess and fixate on everything that's wrong.
- \_\_\_\_\_ 3. When things are going badly for me, I see the difficulties as part of life that everyone goes through.
- \_\_\_\_\_ 4. When I think about my inadequacies, it tends to make me feel more separate and cut off from the rest of the world.
- \_\_\_\_\_ 5. I try to be loving towards myself when I'm feeling emotional pain.
- \_\_\_\_\_ 6. When I fail at something important to me I become consumed by feelings of inadequacy.
- \_\_\_\_\_ 7. When I'm down and out, I remind myself that there are lots of other people in the world feeling like I am.
- \_\_\_\_\_ 8. When times are really difficult, I tend to be tough on myself.
- \_\_\_\_\_ 9. When something upsets me I try to keep my emotions in balance.
- \_\_\_\_\_ 10. When I feel inadequate in some way, I try to remind myself that feelings of inadequacy are shared by most people.
- \_\_\_\_\_ 11. I'm intolerant and impatient towards those aspects of my personality I don't like.

- \_\_\_\_\_ 12. When I'm going through a very hard time, I give myself the caring and tenderness I need.
- \_\_\_\_\_ 13. When I'm feeling down, I tend to feel like most other people are probably happier than I am.
- \_\_\_\_\_ 14. When something painful happens I try to take a balanced view of the situation.
- \_\_\_\_\_ 15. I try to see my failings as part of the human condition.
- \_\_\_\_\_ 16. When I see aspects of myself that I don't like, I get down on myself.
- \_\_\_\_\_ 17. When I fail at something important to me I try to keep things in perspective.
- \_\_\_\_\_ 18. When I'm really struggling, I tend to feel like other people must be having an easier time of it.
- \_\_\_\_\_ 19. I'm kind to myself when I'm experiencing suffering.
- \_\_\_\_\_ 20. When something upsets me I get carried away with my feelings.
- \_\_\_\_\_ 21. I can be a bit cold-hearted towards myself when I'm experiencing suffering.
- \_\_\_\_\_ 22. When I'm feeling down I try to approach my feelings with curiosity and openness.
- \_\_\_\_\_ 23. I'm tolerant of my own flaws and inadequacies.
- \_\_\_\_\_ 24. When something painful happens I tend to blow the incident out of proportion.
- \_\_\_\_\_ 25. When I fail at something that's important to me, I tend to feel alone in my failure.
- \_\_\_\_\_ 26. I try to be understanding and patient towards those aspects of my personality I don't like.