

2009

# Psychosocial outcomes of weight stigma among college students

Sabrina Joann Robinson  
*University of South Florida*

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Psychosocial Outcomes of Weight Stigma among College Students

by

Sabrina Joann Robinson

A dissertation submitted in partial fulfillment  
of the requirements for the degree of  
Doctor of Philosophy  
College of Nursing  
University of South Florida

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## Dedication

This dissertation is dedicated to my family for supporting me along this journey even when it made no sense and I felt like giving up. Most importantly, I dedicate this to my mother, Marlion Reddick who instilled in me the importance of an education and whose unwavering and limitless support comforted me through the long nights, countless assignments and never ending demands of the PhD. Her love and support is what sustained me during this arduous process. This is in loving memory of my mother who I lost along the way.

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## Psychosocial Outcomes of Weight Stigma among College Students

Sabrina J. Robinson

### ABSTRACT

Overweight and obesity are important public health issues in the United States with more than 60% of US adults overweight or obese. The social consequences of being overweight and obese are serious and pervasive. Individuals who are overweight and obese are often the targets of bias and stigma and thus susceptible to negative attitudes. Obesity and weight stigma have been linked to low self-esteem, higher rates of depressive symptoms, body dissatisfaction and poor psychological adjustment.

Although weight stigma is a problem in the general population, it is more consequential among adolescents due to mental and physical developmental changes. Therefore college students were used in this study because they are considered older adolescent (ages 18-21). The goals of this study were to examine the association between weight status, weight stigma, self-esteem, body dissatisfaction and depressive symptoms. These associations were examined using multiple linear regression and linear meditational analysis.

This study found (1) that overweight and obese individuals experience more stigma than their normal weight and underweight counterparts, (2) weight stigma has a

negative effect on body dissatisfaction and depressive symptoms among overweight and obese individuals, (3) self-esteem differed based on perceived weight status, and (4) weight stigma differed among overweight and obese individuals based on self-esteem.

Overall, the psychosocial outcomes of weight stigma are greater for individuals at higher levels of weight. It was found that state self-esteem strongly mediated the relationship between weight and stigma in the prediction of depressive symptoms and body dissatisfaction with the greatest impact for depressive symptoms. Low self-esteem and social support reveal that individuals with low self-esteem experience greater negative psychosocial outcomes as well as those with little or no support unable to buffer stigmatizing experiences and have greater negative psychosocial outcomes. In general, the consequences of weight stigma are as real as the medical consequences of obesity. We are called to protect the psychosocial health of college students.

## CHAPTER ONE

### Introduction

Obesity is pandemic affecting more than a billion people worldwide with two to three times more people being overweight than obese (Malecka-Tendera & Mazur, 2006). Overweight and obesity are considered important public health issues in the United States. More than 60% of US adults are overweight or obese (Wyatt, Winters, & Dubbert, 2006). Obesity has reached epidemic proportions in the United States and around the globe (American Obesity Association [AOA], 2002a). Overweight is defined as a body mass index between 25.0 to 29.9 kg/m<sup>2</sup>, while obesity is defined as a body mass index greater than or equal to 30 kg/m<sup>2</sup> (Flegal, Carroll, Kuczmarski, & Johnson, 2002). Obesity is the second leading cause of preventable death (AOA, 2002b). Moreover, obesity is predicted to be the number one health problem globally by 2025 (Vaidya, 2006). According to the National Center for Health Statistics 17.1% of children and adolescents are overweight. In 2001, the Surgeon General drew attention to overweight and obesity as public health problems with the *Surgeon's General Call to Action to Prevent Overweight and Obesity* (U.S. Department of Health and Human Services, [DHHS], 2001). The burden of overweight and obesity manifests itself in premature death, disability, and most relevant to the present study social stigmatization (DHHS, 2001). The medical consequences of obesity are well documented, however, the most common and immediate consequences of obesity are psychosocial (Fonseca & Gaspar de Matos, 2005; Rudolf, 2004 ). Obesity has been linked to low self-esteem, depressed

mood or depressive symptoms, eating disorders, poor body image, body dissatisfaction, and discrimination (Erermis, Cetin, Tamar, Bukusoglu, Akdeniz, & Goksen, 2004; Fonseca & Gaspar de Mato, 2005; Miller & Downey, 1999; Vaidya, 2006; Young-Hyman, Schlundt, Herman-Wenderoth, & Bozylinski, 2003).

One psychosocial consequence now gaining widespread attention in the literature is weight bias and stigma (Kraig & Keel, 2001; Puhl & Brownell, 2001; Vaidya, 2006; Wadden & Stunkard, 1985; Wang, Brownell, & Wadden, 2004). Obese people are seen as the last acceptable targets of discrimination (Stunkard & Sorensen, 1993). People in American society freely express negative or prejudicial attitudes toward overweight or obese individuals with the notion that these attitudes are acceptable because weight is controllable (Crandall, 1994). Obese people are vulnerable to stigma. There is clear and consistent evidence of weight prejudice in the major areas of employment, health care, and education (Puhl & Brownell, 2001). Puhl, Andreyeva, and Brownell (2008) found 10.3% of women report experiencing weight discrimination daily or at sometime in their life. In a longitudinal study, determining the prevalence of weight discrimination the authors found weight discrimination increased from 7.3% in 1995-1996 to 12.2% in 2004-2006 (Andreyeva, Puhl, & Brownell, 2008). Individuals who are overweight or obese are stigmatized and discriminated against in nearly every aspect of their lives. For example, obese individuals are less likely to be admitted to college or to have their college education funded (Canning & Mayer, 1966; Crandall, 1994; Crandall, 1995). Obese individuals are described as being impulsive, lazy, lacking willpower, motivation, and personal control (Puhl & Brownell, 2001; Wadden & Stunkard, 1985). Weight



stigmatization continues to be endorsed by college students and negative stereotypes that obese individuals are lazy and self-indulgent can become more overt at higher levels of education (Puhl & Brownell, 2001). Overweight students have reported receiving poor evaluations, poor college acceptance rates, and facing dismissal due to their weight (Solovay, 2000).

Stigma is a social construction that recognizes a difference based on some distinguishing characteristic or mark and a consequent devaluation of the person (Dovidio, Major, & Crocker, 2000). According to Goffman (1963) stigma is a sign that labels the bearer as “spoiled” and therefore as valued less than “normal” people. Stigmatized individuals are regarded as flawed and somehow not fully human (Dovidio et al., 2000). Researchers have ordered stigmas into meaningful categories. Goffman (1963) in his classic book *Stigma: Notes on the management of spoiled identity*, identified three types of stigma or stigmatizing conditions: “abominations of the body” (i.e., physical deformity), “blemishes of individual character” (i.e., mental illness), and “tribal identities” (i.e., race and religion). Jones and colleagues (1984) using a different approach identified six types of stigmatizing conditions: (1) “concealability”, refers to the extent to which the stigmatizing mark is visible, (2) “course of mark”, refers to whether the mark may become more salient or progressively debilitating over time, (3) “disruptiveness,” refers to the degree that the stigmatizing characteristic interferes with the flow of interpersonal interactions, (4) “aesthetics”, refers to the subjective reactions to the ugliness of the stigma, (5) “origin,” of the stigmatizing mark, and (6) “peril”, involves the perceived danger of the stigmatizing condition to others. According to Jones and

colleagues the most important dimensions in this approach are peril (perceived danger of the stigma), concealability (the visibility of the stigma), and origin (the controllability of the stigma). For weight stigma, arguably the most important dimensions are visibility and controllability. Hence, the individual who is overweight or obese is subjected to discrimination, prejudice, and stigmatization and blamed for the lack of self-control causing the overweight and/or obesity. Crocker and colleagues (1998) as cited in Dovidio et al. (2000) argue that the most important dimensions of stigma for the experience of both the stigmatizer and stigmatized person are “visibility” and “controllability” which supports the application of these dimensions to weight stigma.

In this study weight-based discrimination, bias, and victimization will be referred to as weight stigma. Weight stigma has been defined as negative attitudes and actions towards overweight and obese individuals that influence interpersonal relations. Weight stigma reflects internalized attitudes towards overweight and obese individuals and affects how these individuals are treated. Weight stigma may take many forms; however, in this study the forms of weight stigma that will be explored are bullying, teasing, and discrimination due to weight. Discrimination is the act of treating people differently than others based on some characteristic that has nothing to do with their potential and abilities (Libal, 2006). According to the Merriam-Webster Dictionary bias is an inclination of temperament or outlook; especially a personal and sometimes unreasoned judgment: prejudice (Merriam-Webster, Incorporated, 2001). On the other hand, victimization is unsolicited bullying or teasing by peers (Pearce, Boergers, & Prinstein, 2002).

Adolescence is characterized as a period of transition from childhood to adulthood, during which there are many physical, psychological, and social changes. Because of the many physical changes that adolescents experience and their increased attention to their physical appearance, and because they are in the stage of developing their self-identity, body image and self-esteem tend to be very intertwined during adolescence (Neumark-Sztainer & Eisenberg, 2005). This transition is similar to the one during the college years making students susceptible to mental illness. The proposed study utilized a college student sample because, as older adolescents, college students' body image and self-esteem may still be intertwined. In addition, the most common place where adolescents experience bias is at school (Neumark-Sztainer & Eisenberg, 2005) therefore using college students is appropriate since they are attending school. From nursery school throughout college, overweight students experience ostracism, discouragement, and sometimes violence (Latner & Schwartz, 2005). Given this notion, weight bias was explored among college students and the corresponding effects on body image and depressive symptoms were examined.

The research literature has documented that overweight and obese individuals experience social stigmatization, discrimination, ostracism, and prejudice due to their weight status. The psychosocial costs of overweight and obesity have been documented in the literature and include depression, body dissatisfaction, and low self-esteem (Franklin, Denyer, Steinbeck, Caterson, & Hill, 2006; Ozmen et al., 2007). However, the research literature is inconclusive about the effects of stigma on the psychosocial well-being of overweight and obese individuals specifically the relationship between stigma

and self-esteem (Crocker & Major, 1989). Furthermore, the research findings are inconsistent regarding the association between self-esteem and overweight. Some researchers have found overweight and obese individuals to have lower self-esteem while other researchers have found no difference in self-esteem when compared to normal weight individuals (Miller & Downey, 1999). Due to the inconsistencies in the literature and research findings failing to support the proposed association based on theory, Crocker and Major (1989) proposed that self-esteem may have self-protective properties given the context of the circumstances.

### Theoretical Framework

Crocker and Major (1989) initially examined traditional theories for explaining the effects of social stigma on self-esteem that can be applied to overweight and obese individuals. Reflected appraisals or the “looking glass self” view, states that the self-concept develops through interactions with others and is a reflection of other’s appraisals of oneself. According to this theory, members of stigmatized groups such as overweight individuals who know they are regarded negatively by others incorporate those negative attitudes into their self-concept and consequently have lower self-esteem (Crocker & Major, 1989). Another traditional view is the self-fulfilling prophecy which occurs when the stigmatizer or perceiver acts on his or her false beliefs about an individual or target in a manner that those beliefs come to be confirmed by the behavior of the individual or target. In other words, stigmatizers hold negative views about overweight or obese individuals who may alter their behavior to be consistent with the negative stereotypes. In contrast to the looking glass self perspective, the self-fulfilling prophecy view does not

require individuals to know the negative attitudes toward their group in order for those negative attitudes to affect their self-concept (Crocker & Major, 1989). Finally, a third traditional view predicts that stigmatized members would have low self-esteem is efficacy-based self-esteem. Self-esteem according to this perspective is not passively acquired but earned by one's own competent action. By learning that one can both control and manipulate one's environment, the individual acquires a view of the self as competent, successful, able and subsequently self-esteem is high. However, if there are any conditions that block the opportunity to interact with the environment successfully low self-esteem may result. According to this point of view, individuals who are overweight and obese should have lower self-esteem than normal weight individuals given the stigma associated with overweight and obesity due to the limited opportunities to control and manipulate their environment (Crocker & Major, 1989).

These theories and others have predicted that social stigma has negative effects on self-esteem. This prediction has been widely accepted and assumed true. However, the empirical evidence generally does not support this prediction. The research is inconsistent about the nature of the relationship between social stigma and self-esteem. According to Crocker and Major (1989) one of the explanations for failing to support social stigma's negative effects on self-esteem, or stated differently failure to find low self-esteem among the stigmatized, is that self-esteem is developed early in life and does not change in response to interpersonal situations. Another explanation is that individuals who are prejudiced or discriminate against stigmatized members do not constitute significant others for the members of stigmatized groups and, as a result,

stigmatized individuals do not incorporate those negative appraisals into their self-view. A final explanation for failing to find low self-esteem in stigmatized persons is that the affective reactions many people have toward stigmatized individuals are ambivalent, rather than consistently negative (Crocker & Major, 1989).

Crocker and Major (1989) postulated that there were several mechanisms that buffer the self-esteem of stigmatized groups from the prejudice of others in what they call the *self protective properties of stigma*. One of the mechanisms that may protect the self-esteem of stigmatized groups is attributing negative feedback or poor outcomes to the prejudiced attitudes of others toward their group. In other words attributing discrimination not to oneself but to the perceiver's attitude about overweight and obese individuals as a whole generally protects self-esteem. A more common scenario is a racial minority attributing discrimination not to themselves but to their racial group which in turns buffers self-esteem. This self-protective mechanism is powerful in that the individual can utilize this method in response to negative evaluations or outcomes that either stem from prejudice against a stigmatized group like overweight and obese individuals or do not stem from prejudice (Crocker & Major, 1989). According to this viewpoint lowered self-esteem results when attributing negative outcomes or negative feedback to internal, stable causes whereas attributing these same outcomes to external causes protects the self-esteem in stigmatized individuals. Another mechanism that can buffer the self-esteem of members of stigmatized groups is ingroup social comparisons (Crocker & Major, 1989). Stigmatized individuals may compare themselves with other stigmatized individuals who share a common fate for the following three reasons: (1) as a

consequence of a segregated environment (a proximity effect), (2) to obtain accurate self-evaluations (a similarity effect), or (3) to avoid unpleasant or painful social comparisons (a self-protective effect). As result ingroup comparisons allow the stigmatized to avoid self-esteem threatening consequences of outgroup social comparisons. Ingroup comparisons are advantageous to the self-esteem of stigmatized individuals because these individuals are generally disadvantaged in the larger society (Crocker & Major, 1989).

A third mechanism to protect the self-esteem of stigmatized groups from negative feedback or comparisons with others is by selectively devaluing performance dimensions for which they or their group fare poorly and selectively valuing those dimensions on which they or their group excels (Crocker & Major, 1989). The authors theorize that members of stigmatized groups tend to view those attributes on which they or members of their group fare poorly relative to others as less important to their self-definition and those attributes on which they or members of their group excel as more important to their self-definition. This selective valuing is socially created and is caused by receiving negative or positive feedback, comparing favorably or unfavorably with others and being discriminated against or advantaged in certain areas. This selective valuing process protects the self-esteem of stigmatized individuals (Crocker & Major, 1989).

Based on the three protected mechanisms proposed, members of stigmatized groups in this case individuals who are overweight or obese may (a) attribute negative feedback to prejudice against the overweight and obese, (b) compare their outcome with those of other overweight and obese individuals, rather than with the relatively advantaged outgroup (normal weight individuals), and (c) selectively devalue those

dimensions on which their group fares poorly and value those dimensions on which their group excels.

### Purpose and Aims

The purpose of this study was to explore the relationship between weight stigma and psychosocial health among college students. The goals of this study were to identify the incidence or prevalence of weight stigma among college students and to explore the nature of the relationships between weight status, weight stigma, and self-esteem on psychosocial health. To accomplish this purpose and goals, the following aims were identified:

- I. To understand the relationships between weight-related variables (weight status and weight stigma) and psychosocial health outcomes (depression and body image).

H<sub>1</sub>: Weight-related variables are positively related to depressive symptoms.

H<sub>2</sub>: Weight-related variables are negatively related to body image.

- II. To assess the potential mediating role of self-esteem in the relationship between weight-related variables and mental health outcomes.

H<sub>3</sub>: Measures of self-esteem (trait and state) will mediate the relationship between weight-related variables and depressive symptoms.

H<sub>4</sub>: Measures of self-esteem (trait and state) will mediate the relationship between weight-related variables and body image.



III. To assess the potential mediating role of weight stigma in the relationship between weight status and self-esteem.

H<sub>5</sub>: Measures of weight stigma will show evidence of mediation between weight status and self-esteem. It is hypothesized that weight stigma will mediate the relationship between perceived weight status and global self-esteem (Thompson, Coovert, Richards, Johnson, & Cattarin, 1995; Wardle & Cooke, 2005). Miller and Downey (1999) found that perceived weight was a better predictor of self-esteem than actual body weight. Based on the literature there is no prediction about the nature of the relationship between actual weight, weight stigma or self-esteem or weight stigma mediating the relationship between perceived weight and state self-esteem.

A secondary aim was to examine the moderating effects of perceived control over weight and perceived social support on weight stigma. It was hypothesized that the more control an individual had over their weight the more experiences of weight stigma and subsequent decrease in body satisfaction, self-esteem and increase in depressive symptoms. Whereas, the more social support an individual has the less likely the individual is stigmatized, have low self-esteem, depressive symptoms or body dissatisfaction.

The logic model developed for this study appears in Figure 1 depicting the primary hypotheses.

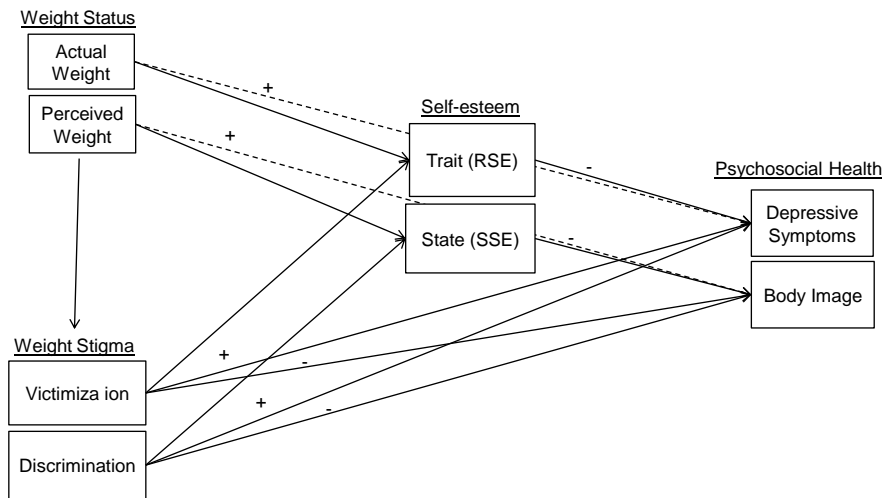


Figure 1. Logic and Path model depicting relationships of variables.

In Figure 1, actual weight and perceived weight were hypothesized to have a direct inverse effect on self-esteem and in turn self-esteem had a direct inverse effect on depressive symptoms and body image. The direct effect of actual and perceived weight on depressive symptoms and body image were a secondary focus and hypothesized to be nonsignificant. Perceived weight was a better predictor of self-esteem and weight stigma than actual weight. Miller and Downey (1999) found that self-perceived weight was a significant predictor of self-esteem. Furthermore, Kim and Kim (2001) found that Korean girls aged 15-19 that perceived themselves to be overweight were at increased risk of depression and low self-esteem regardless of actual weight. Next, actual and perceived weight were hypothesized to have a direct effect on weight stigma meaning as weight

increases the experience of weight stigma also increased. To support the use of perceived weight in the analysis of the relationship between weight stigma and self-esteem, Eisenberg, Neumark-Sztainer, & Story (2003) found self-esteem to be inversely related to experiences of teasing regardless of actual weight. Next, discrimination and victimization had a direct effect on depressive symptoms and body image. Victimization and discrimination increased depressive symptoms and body dissatisfaction. Discrimination and victimization had a direct effect on self-esteem. As discrimination and victimization, increased self-esteem decreased and consequently resulted in greater depressive symptoms and body dissatisfaction. State self-esteem was hypothesized to show the greatest change since it is situationally constructed (Crocker, 1999; Heatherton & Polivy, 1991). Traditionally, global self-esteem has been thought to be a stable personality characteristic. According to Crocker (1999), self-esteem emerges in the situation and is a function of the meaning given to it therefore lending it to be situationally constructed or context-specific. Therefore, state self-esteem should show acute changes in the self-esteem that are the result of specific situations such as experiencing weight stigma.

Teasing is known to be associated with low self-esteem, increased depressive symptoms, body dissatisfaction, and suicidal ideation and attempts among girls (Eisenberg et al., 2003; Neumark-Sztainer et al., 2002a). Due to inconsistencies in the literature the nature of self-esteem is unclear therefore the role of self-esteem will be assessed as a moderator between weight stigma and psychosocial well-being and then as a mediator between weight stigma and psychosocial well-being. State Self-esteem acted

as a mediator and a moderator in this study because of the meaning given to self-esteem and how it was constructed in the situation of weight stigma. For the role of self-esteem, it was hypothesized that if self-esteem was high, experiences of discrimination and victimization would be minimized and therefore no negative relationships with body dissatisfaction or depressive symptoms would be seen. On the other hand, if self-esteem was low, the individual is more susceptible to discrimination, victimization, consequently increased depressive symptoms, and body dissatisfaction. The moderating role of self-esteem is not depicted in the model above. Then the mediating effect of weight stigma will be assessed after the competing role of self-esteem is assessed. It was hypothesized that as weight increases, the perception of overweight and obesity will be related to more victimization and discrimination and as a result lower self-esteem. Finally, the relationship between self-esteem and psychosocial health outcomes of depressive symptoms and body dissatisfaction was examined. It was hypothesized that there would be direct relationship between self-esteem and psychosocial well-being, meaning that as self-esteem increases or decreases psychosocial well-being will also increase or decrease. A secondary aim was to examine whether the relationships in the logic model in Figure 1 are moderated by perceived control over weight and social support. It was hypothesized that the more control over weight an individual perceives, greater discrimination and victimization may occur, leading to lower self-esteem, greater depressive symptoms and body dissatisfaction. It was hypothesized that social support buffers the experiences of discrimination and victimization, therefore, preserving self-esteem and not resulting in body dissatisfaction or depressive symptoms.

In summary, as the attention to the obesity epidemic has intensified the social consequences of being overweight and obese have been ignored and these effects are pervasive and serious. In addition, as the obesity epidemic continues to accelerate so will the incidence of weight stigma. For these reasons, it is imperative to study the incidence and prevalence of weight stigma in addition to the risk factors and psychosocial sequelae that result. Stigma is a social construction based on a distinguishing characteristic and consequently devalues the individual. The self-esteem of the stigmatized and overweight has been traditionally researched due to ease of measurement. However, the results are inconsistent regarding whether overweight and obese individuals have lower self-esteem than their average weight counterparts and whether stigma decreases the self-esteem in stigmatized individuals. This study was based on Crocker & Major's theory (1989) entitled the *Self-protective properties of stigma*. This theory postulates three ways in which a stigmatized individual can buffer the self-esteem: (1) by attributing negative criticism and outcomes to the prejudice against their group in this case overweight and obese individuals, (2) comparing their outcomes with those of the ingroup or stated differently, comparing themselves to other stigmatized individuals or obese and overweight individuals, rather than to the nonstigmatized or average weight individuals, and (3) selectively failing to recognize those dimensions on which their group (overweight and obese individuals) fares poorly on (i.e., athletic ability) and valuing those dimensions on which their group excels.

The purpose of this study was to explore the relationship between weight stigma and psychosocial well-being with a goal of identifying the prevalence of weight stigma

among college students and exploring the nature of the relationship between weight status, weight stigma, perceived control, social support, and self-esteem on psychosocial well-being. A major contribution of this research was to identify the role of self-esteem in the relationship of weight stigma and psychosocial well-being. A secondary contribution was to examine whether perceived control and social support moderate these relationships. To date research on weight stigma and bias among college students is scarce. Therefore, this study sought to add to existing knowledge, shed light on the complex nature of self-esteem on psychosocial well-being among college students, and establish prevalence data of weight stigma among this population.

Chapter 2 contains a review of literature on overweight and obesity and the subsequent psychosocial consequences. Literature was presented to illustrate the effects of overweight and obesity on self-esteem, body image, and depression. In addition, literature was presented that illustrate the effects of weight stigma on self-esteem, body image, perceived control, social support and depression. A brief review of meditation and moderation model testing and self-reported height and weight were presented.

## CHAPTER TWO

### Literature Review

Obesity has reached epidemic proportions in the United States and around the globe (American Obesity Association [AOA], 2002a). Currently, obesity is the second leading cause of preventable death (AOA, 2002b). Moreover, obesity is predicted to become the number one health problem globally by 2025 (Vaidya, 2006). According to the National Center for Health Statistics 17.1% of children and adolescents are overweight and 32.2% of adults are obese. The medical consequences of obesity are well documented. However, the most common and immediate consequences of obesity are psychosocial (Rudolf, 2004). This review of the literature is focused on the effects of weight stigma on self-esteem, body image, and depression negative sequelae of obesity. The review ends with a discussion of possible moderators of weight stigma, moderational and meditational model testing and self-reported height and weight.

#### *Weight Stigma*

There is a pervasive stigma and bias in our society regarding obesity. Obesity is said to be the “last acceptable form of prejudice” and discrimination (Stunkard & Sorensen, 1993). Obese individuals are stereotyped as being lazy, stupid, gluttonousness, ugly, impulsive, lacking willpower, motivation, and personal control (Puhl & Brownell, 2001; Latner & Stunkard, 2003). There is sufficient evidence of discrimination, bias, and victimization of overweight and obese individuals across all aspects of life such as education, employment, social interactions and both romantic and sexual relationships

(Chen & Brown, 2005; Pearce, Boergers & Prinstein, 2002; Puhl & Brownell, 2001). Unlike other stigmatized groups, people in society freely express prejudicial attitudes toward overweight and obese individuals often justifying these attitudes on the premise that weight is controllable (Crandall, 1994).

To illustrate the stigma of obesity Schwartz, Vartanian, Nosek, & Brownell (2006) examined the influence of one's own body weight on anti-fat bias using a large online sample. The authors found more negative attributes were associated with obese people compared with thin people. As weight increased anti-fat bias was decreased. Obese people were characterized as being lazy and unmotivated compared with thin people. It is interesting to note that 46% of respondents reported they would be willing to give up at least one year of life rather than being obese and 15% reported they would give up 10 or more years of life (Schwartz et al., 2006). Similarly, 30% of respondents reported they would rather be divorced, 25% would rather be infertile, 15% would rather be severely depressed and 14% would rather be alcoholic than obese (Schwartz et al., 2006). This supports the pervasiveness of the stigma of obesity in that individuals are willing to give up something than rather be obese.

Peer rejection in the school setting is an overweight or obese student's first challenge in education. Prejudicial attitudes and peer rejection are one of the most widespread sources of stigmatization of obese children (Schwartz & Puhl, 2003). Research has shown that anti-fat attitudes are present in children as young as three years of age (Cramer & Steinwert, 1998). In a classic study by Richardson and associates (1961) children were asked to rank pictures of children with varying physical



characteristics and disabilities in the order of who they would like to be friends with the most, children consistently ranked the picture of the obese child last among pictures of children with crutches, in a wheelchair, with an amputated hand, and a facial disfigurement (Richardson, Goodman, Hastorf, & Dornbusch, 1961). In a similar study Goldfield and Chrisler (1995) asked first graders to identify body silhouettes of children they would like to be friends with, looked most like them, and which was the good child. Most children indicated they look less like the fat child and were less likely to say they would be friends with the fat child (Goldfield & Chrisler, 1995). Musher-Eizenman, Holub, Barnhart, Goldstein, and Edwards-Leeper (2004) applied the same principles but also explored the application of attribution theory to preschool children's evaluation of overweight individuals. The authors found the chubby figure was consistently rated lower than the other figures. The chubby figure was chosen 16% of the time as a friend and 7% as a best friend compared with the average weight figure (Musher-Eizenman et al., 2004). Further, preschool children attributed low or moderated control to the overweight children and attribution scores were associated with negative ratings of the chubby figure. In a replication study, Margulies, Floyd, and Hojnoski (2007) found African American preschool children also rated the overweight figure lower than the normal and underweight figures. In contrast, the African American preschool children chose the overweight figure 33% of the time as a friend whereas the underweight figure was chosen 19% of the time. Similar to previous research the preschool children attributed a greater amount of control to the overweight figure than the underweight figure. In addition, controllability was negatively correlated with adjective ratings

indicating the more control the child has the more negative the ratings of that child. The children attributed the overweight due to lack of exercise and eating too much food (Margulies et al., 2007).

Disapproving attitudes about obese individuals are evident among college students, which signify that weight stigmatization can be more overt at higher levels of education (Puhl & Brownell, 2001). Canning and Mayer (1966) examined school records and college applications of high school students and found that obese students were accepted less frequently than normal weight students. Several studies conducted by Crandall (1991; 1995) found parental bias towards their overweight children. Further, overweight men and women were underrepresented in those who attend college and overweight females were less likely to receive family financial support for college (Crandall, 1991; Crandall, 1995). Latner, Stunkard and Wilson (2005) replicated the Richardson and colleagues work from (1961) using a sample of college students. The college students ranked the obese person lower than the healthy person but not lower than the person missing a hand (Latner et al., 2005). Differences by ethnicity showed that African American and Asian students ranked the obese person more favorably than their white counterparts did. Further, African American women liked the obese person more than did white women. These findings suggest greater stigmatization by whites. Men responded less favorably to the obese drawing than women. Moreover, the authors found that adults liked the obese figure more and the figure missing a hand less than children did (Latner et al., 2005).

Additional studies have explored black and white differences in the stigma of obesity. Neumark-Sztainer, Story & Faibisch (1998) found that nearly all adolescent girls experienced hurtful comments and differential treatment due to being overweight. African American girls reported being stigmatized or being in hurtful situations by strangers while Caucasian girls did not report this. One third of African American girls reported being treated unfairly due to weight, one third due to race and another third to both (Neumark-Sztainer et al., 1998). In the same way, Hebl & Heatherton (1998) found white women stigmatized both large black and white women across all dimensions whereas black women belittled white women for intelligence, relationship success and happiness and large black women for attractiveness only. Black women were rated as more attractive, intelligent, successful in jobs and relationships, happy and popular than white targets by both black and white women (Hebl & Heatherton, 1998). Overall, there was a strong stigma of obesity for white women and no stigma of obesity for black women (Hebl & Heatherton, 1998).

Myers and Rosen (1999) in a study of obesity stigmatization and coping found that more frequent exposure to stigmatizing situations such as hurtful comments were associated with greater psychological distress, poorer body image, and lower self-esteem. Friedman, Reichmann, Costanzo, Zelli, Ashmore and Musante (2005) explored the relation between weight stigmatization and psychological function in a clinical sample of obese treatment seeking adults. The most frequent stigmatizing situations were unflattering assumptions about obese people ( $\mu = 1.79$ ), being avoided, excluded or ignored due to weight ( $\mu = 1.63$ ), and receiving hurtful comments from children ( $\mu =$

1.24) which occurred several times in their lives (Friedman et al., 2005). Females reported more body image distress and more depression. As a result, higher depression is associated with more frequent stigmatizing experiences.

In a comparison study of average weight, at risk for overweight and overweight girls between the ages of 14-17, Thompson, Shroff, Herbozo, Cafri, Rodriguez & Rodriguez (2007) found that at risk for overweight and overweight girls received more negative comments about their appearance and believed their friends would accept them more if they were attractive.

In a series of studies by DeJong (1980; 1993) explored the influence of the cause of obesity on peer attitudes and task performance among high school girls. The author found that the obese target without a thyroid condition was rated more negatively than the normal weight target without a thyroid target and was rated as lacking will power and having less self-control (DeJong 1980; 1993). Likewise, the obese target with a thyroid condition was rated more favorably on self-indulgence and self-discipline than the obese target without a thyroid condition (DeJong 1980; 1993). Further obese targets were like less than the normal weight target however, the obese target with a thyroid condition was liked more than the obese target without that condition. In addition, the obese targets were seen as less physically attractive than normal weight targets (DeJong, 1980; 1993). The girls did not subscribe to the “jolly” fat stereotype (DeJong 1980; 1993). The obese target lacking a thyroid condition was rated as less feminine, less sharp, less strong, less dynamic and more lenient (DeJong, 1993). These studies illustrate weight stigma of

obese individuals based on the assumption that obesity is not caused by a glandular disorder therefore leading to derogation of the individual who is obese.

In an exploration of social marginalization of overweight adolescents in relationships with school peers, Strauss and Pollack (2003) found that overweight adolescents are socially marginalized among their peers. Overweight adolescents were isolated and more peripheral to social networks than their normal weight peers. Overweight adolescents received fewer friendship nominations than their normal weight counterparts did. Overweight adolescents were also less likely to receive five or more friendship nominations and less likely to receive two or more best friend nominations than their normal weight peers. Furthermore, overweight adolescents were less likely to be nominated as friends. Peers who nominated overweight adolescents were less popular and friends of overweight adolescents received fewer friendship nominations than friends of average weight students. Stigmatization of overweight adolescents was evident in that adolescents nominated by overweight adolescents were less likely to reciprocate friendship nominations (Straus & Pollack, 2003). In an ethnically diverse sample of high school, students Pearce and colleagues (2002) found obese adolescents reported more overt victimization than their overweight counterparts did. Moreover, obese girls reported more relational victimization than their average weight counterparts (Pearce et al., 2002). Likewise, obese girls and boys were less likely to date than overweight and average weight peers. Thus, 50% of obese girls and 29% of obese boys reported no experience dating (Pearce et al., 2002). Furthermore, Chen and Brown (2005) found that obese individuals were the least preferred sexual partners than individuals with sexually

transmitted diseases, being in a wheelchair, missing arms or having a mental illness. Men ranked obese partners lower than females. These findings illustrate the stigma of obesity in interpersonal relationships.

Similarly, the stigma of obesity is evident in social interactions of obese individuals. Miller, Rothblum, Barbour, Brand & Felicio (1990) evaluated the social interactions of both obese and nonobese women when weight was unknown. Obese women were rated as less likable, less socially skilled and less physically attractive. The heavier the overweight women, the more they were rated negatively on social skills, liability, physical attractiveness and positively on negative affect (Miller et al., 1990). Further, telephone partners of obese women liked the woman less, and reported that obese women made a less favorable impression, were less friendly, less comfortable and did not get to know them well (Miller et al., 1990).

In a study, exploring the relationship of internalization of weight-based stereotypes on eating behaviors and emotional well-being in a sample of overweight and obese women the authors found that 63% of respondents believed stereotypes to be false (Puhl, Moss-Racusin, & Schwartz, 2007). The authors report that individuals who believed stereotypes to be false refused to diet as compared to those who reported stereotypes were false. Further, the authors found that neither stereotype beliefs nor stigma experiences predicted the use of weight loss strategies as response to bias. However, the authors found that participants who believed stereotypes to be true engaged in more binge eating behavior. In other words overweight and obese women who internalize stereotypes may binge eat than diet in response to bias (Puhl et al., 2007).

*Weight Teasing.* A study by Neumark-Sztainer and colleagues (2002a) found that weight teasing was prevalent among overweight and obese adolescents with 25% of youth reporting being teased about their weight. Very overweight girls and boys reported more teasing by both peers and family members and being bothered by the teasing (Neumark-Sztainer et al., 2002a). Further, the authors found a positive association between weight-teasing and unhealthy weight control behaviors. Eisenberg et al. (2003) reported that teasing was a common experience for boys and girls, with 54.7% reporting being teased by their peers. Moreover, the authors found that 50% of adolescent girls teased by both family members and peers reported thinking about suicide compared with their non-teased counterparts. Furthermore, 25% of girls teased reported attempting suicide (Eisenberg et al., 2003).

In a similar study, Eisenberg, Neumark-Sztainer, Haines, and Wall (2006) found in a longitudinal prospective study that approximately 33% of males and 44% of females were teased about their weight at the beginning of the study and about 61% of those teased also reported teasing 5 years later. Teasing was more common among those with higher body mass indexes. The authors found that weight teasing was associated with lower self-esteem, lower body satisfaction and higher depressive symptoms after 5 years of follow-up (Eisenberg et al., 2006). In a corroborating study, Hayden-Wade, Stein, Ghaderi, Saelens, Zabinski and Wilfley (2005) found 78% of overweight youth were teased about their appearance with 89% of those teased about their weight. The heavier the child the more weight concerns, greater loneliness, and preference for sedentary isolative activities. The authors found girls had more weight concerns, greater loneliness

and higher preference for isolative activities (Hayden-Wade et al., 2005). Weight teasing in general was associated with higher weight concerns, higher preference for isolative sedentary activities and lower confidence in physical appearance (Hayden-Wade et al., 2005). In a study of 372 middle school girls 23% of girls reported being teased by a parent about their appearance and 12% reported the parent teased them about their weight (Keery, Boutelle, van den Berg, & Thompson, 2005). Strikingly, 29% of girls were teased by their siblings which was associated with higher levels of depression than their non-teased counterparts (Keery et al., 2005). The authors found differences by parent teasing on psychosocial outcomes. Teasing by mothers only predicted depression whereas father teasing predicted body dissatisfaction, bulimic behaviors, self-esteem and depression (Keery et al., 2005), thus, indicating that negative appraisals by fathers have more outcomes that are negative for youth. Overall, the authors found that teasing was associated with body dissatisfaction, self-esteem, bulimic behaviors and depression.

In a clinical sample of obese women presenting for outpatient treatment frequency of childhood teasing was unrelated to overweight and body image or self-esteem in adulthood (Grilo, Wifley, Brownell, & Rodin, 1994). Women who reported frequent childhood teasing were more dissatisfied with their bodies during adulthood. Teasing was not correlated with self-esteem in this clinical sample of obese women. However, self-esteem was negatively correlated with body dissatisfaction. The authors found differences in outcomes based on the onset of obesity. Early-onset obesity before age 18 was associated with more teasing about weight/size, general appearance, more body dissatisfaction and self-esteem compared those with adult-onset obesity (Grilo et al.,



1994). Consequently, teasing predicts low body satisfaction, low self-esteem, increased depressive symptoms, and suicidal ideation and attempts, with girls expressing the most distress from being teased (Eisenberg et al., 2006; Eisenberg et al., 2003; Neumark-Sztainer et al, 2002a). In a study of extremely obese treatment seeking adolescents Stern and colleagues (2007) found teasing to be significantly associated with self-esteem ( $r = -.39, p = .001$ ). This finding suggests that as the experience of teasing increases self-esteem decreases (Stern, Mazzeo, Gerke, Porter, Bean & Laver, 2007). Stated differently the teasing overweight adolescents experience may lower their self-esteem. Research has concluded that weight related teasing is common among overweight and obese children and adolescents (Eisenberg et al., 2006; Eisenberg et al., 2003; Neumark-Sztainer, Story, Hannan, Perry, & Irving, 2002b) and adults (Grilo et al., 1994).

*Bullying.* Janssen, Craig, Boyce, Pickett (2004) explored the association between overweight and obesity with bullying behavior in school-aged children. Janssen et al. (2004) found that the incidence of bully-perpetrators increased with increasing body mass index in girls. In other words the more overweight or obese a girl, the more bullying behavior experienced by peers and the more overweight individuals bullied others. Another interesting finding was that overweight and obese 15 to 16 year olds were more likely to perpetrate bullying than their normal weight peers (Janssen, Craig, Boyce, & Pickett, 2004).

In a different study, Storch and colleagues (2007) found that 25% of overweight and at-risk for overweight youth experienced peer victimization. Further, the authors found peer victimization predicted depressive symptoms in a community sample of

overweight and at-risk for overweight low-income children between the ages of 8 and 18 presenting for an appointment at the University of Florida Pediatric Lipid Clinic (Storch, Milsom, DeBraganza, Lewin, Geffken, and Silverstein, 2007). In addition, the authors found that peer victimization was positively related to depressive symptoms, anxiety, loneliness and social physique anxiety (Storch et al., 2007). Simply stated the more an overweight or at-risk for overweight child experiences victimization depressive symptoms, anxiety, loneliness and social physique anxiety increases. These studies show that there is a pervasive bias against the overweight and obese. It is logical to think that bias and stigma of the obese create prejudice and discrimination. The consequences of obesity stigma are not limited to the overweight or obese individual. Research shows that people in close proximity to overweight individuals are judged more negatively than those with normal weight individuals (Hebl & Mannix, 2003).

*Discrimination.* To illustrate discrimination due to obesity Carr and Friedman (2005) found in a nationally representative sample of adults very obese individuals reported significantly lower self-acceptance scores and more frequent daily discrimination. Obese persons were more likely to attribute their discriminatory experiences to weight or appearance than normal weight individual (Carr & Friedman, 2005).

Andreyeva et al. (2008) examined the trends in perceived weight/height discrimination in comparison with other forms of discrimination in a nationally representative sample of adults between the ages of 35-74. The prevalence of weight/height discrimination among US adults rose from 7.3% in 1995-1996 to 12.2% in

2004-2006 (Andreyeva et al., 2008). Women reported more weight/height discrimination than men. In 2004-2006 15.5% of women reported experiencing discrimination due to weight/height versus 10% in 1995-1996 whereas, the prevalence in men rose from 4.1% to 8.1% during the same time period (Andreyeva et al., 2008). More weight/height discrimination was reported in interpersonal relationships as opposed to institutional settings such as employment and education. However gender discrimination was the most prevalent form of perceived discrimination followed by age discrimination (Andreyeva et al., 2008). The authors report no significant increase in weight/height discrimination for overweight and obese participants. However the rates of weight/height discrimination were high among those of increasing body mass index, individuals with a BMI of 30 -35 increased by 15%, and increased by 70% for individuals with a BMI greater than or equal to 35. (Andreyeva et al., 2008).

In an attempt to provide prevalence data of weight discrimination in the United States Puhl, Andreyeva, and Brownell (2008) used a representative sample of men and women from the National Survey of Midlife Development and compared the prevalence of discrimination based on race and gender. The prevalence of weight and height discrimination ranged from five percent in men to ten percent in women with 40 percent of individuals with a body mass index greater than or equal to 35 (Puhl et al., 2008). The authors report race and gender differences in weight/height discrimination. Women with low educational attainment experienced the most discrimination due to weight. Minorities experienced more weight/height discrimination than their white counterparts, particularly African Americans (Puhl et al., 2008). Among the different types of

discrimination studied weight/height discrimination was the third most prevalent cause of perceived discrimination among women and fourth overall for all adults. Most weight/height discrimination was reported primarily in employment settings followed by discrimination from service providers. Participants reported receiving poorer service or being denied service. In educational settings, being denied scholarships or discouraged by teachers and advisor for pursuing higher education was reported (Puhl et al., 2008). Weight/height discrimination was commonly reported in daily interpersonal relationships. The most common types of discrimination due to weight and height were being treated with less respect and courtesy than other people and being treated inferiorly. Being called names or insulted due to weight/height discrimination was the most common direct form of interpersonal bias (Puhl et al., 2008). The authors report that younger individuals and women were at high risk for weight/height discrimination. Furthermore the authors found that increasing body weight and obesity increased the odds of being discriminated against due weight/height (Puhl et al., 2008).

#### *Depressive Symptoms/Depression*

Another psychosocial consequence of obesity and weight stigma is depression. However, the nature of the relationship between obesity and depressive illness remains unclear (Dixon, Dixon, & O'Brien, 2003). The social stigmatization associated with obesity may lead to affective disorders such as depression or depressive symptoms (Goodman & Whitaker, 2002). Social stigmatization may lead to social isolation but currently there have been no studies examining social isolation among overweight children and adolescents (Strauss & Pollack, 2003).

There are consistent results about the association between adolescent obesity and depression. For example, Erermis, et al. (2004) reported higher depression scores and greater prevalence of depressive disorders in the clinical obese group compared to a nonobese group. Overall, depression scores on the Children's Depression Inventory were higher among obese adolescents (Erermis et al., 2004). Onyike, Crum, Lee, Lyketsos, and Eaton (2003) report past-month depression was lower among normal weight participants than among obese individuals. Depression prevalence increased with increasing body mass index (BMI) suggesting that the prevalence of depression is dependent on the severity of obesity (Onyike et al., 2003). Goodman and Whitaker (2002) report that baseline depressed mood was associated with follow-up obesity and predicted obesity development at 1 year follow-up. This suggests a linear relationship with depression being antecedent to obesity development in adolescents. In addition, depressed mood predicted one year follow-up BMI in obese adolescents suggesting that depressed mood causes worsening obesity (Goodman & Whitaker, 2002). In a study of Chinese adolescents there was a significant positive relationship between BMI and depressive symptoms, in adolescent girls (Xie et al., 2003). Xie, et al. (2003) also reported that adolescents who perceived themselves as overweight experienced higher levels of depressive symptoms than normal weight adolescents. Mustillo, Worthman, Erkanli, Keeler, Angold, & Costello (2003) used a cohort longitudinal study to examine the association between obesity in childhood and adolescence and the development of psychiatric disorders. Chronically obese participants had significantly higher rates of depression (Mustillo et al., 2003). In a study of 214 overweight women aged 16 and over

seeking weight reduction treatment, one in four were currently depressed (Hulens, Vansant, Claessens, Lysens, Muls, & Rzewnicki, 2002).

Several research studies have posited an association between adolescent depression and adult obesity. Depression has been implicated as a risk factor for obesity development in adults (Richardson et al., 2003). Richardson et al. (2003) examined the association between adolescent depression and adult onset of obesity in a birth cohort of 1037 in New Zealand. Among early adolescents, obesity was common in those who were depressed and, further adult obesity was positively associated with depression in late adolescent girls, meaning that the older the depressed adolescent female the more likely she will be obese in adulthood (Richardson et al., 2003). In a similar study by Pine, Goldstein, Wolk, and Weissman (2001) childhood depression was associated with adult BMI status. Furthermore, the duration of depressive symptoms emerged as a salient predictor of increased BMI in adulthood (Pine, Goldstein, Wolk, & Weissman, 2001).

Eating behaviors are said to be linked to depression. In a school-based sample of 4746 adolescents, overeating was associated with depressive mood, self-esteem, and body dissatisfaction (Ackard, Neumark-Sztainer, Story, & Perry, 2003). Isnard et al. (2003) reported a significant positive relationship between depression and binge eating in a clinical obese population seeking treatment. In a study of 126 children and adolescents, seeking inpatient treatment for obesity, binge eaters and non-binge eaters did not differ on the eating Disorder Examination-Questionnaire (Decaluwe, Braet, & Fairburn, 2003). In addition, obese binge eaters and non-binge eaters did not differ in severity of depression although 48.8% of binge eaters and 45.9% of non binge eaters scored high

enough to be considered depressed (Decaluwe et al., 2003). In a study of adolescent high school girls, elevated depressive symptoms predicted the onset of binge eating (Stice & Spangler, 2002). Therefore, depressive symptoms are a risk factor for binge eating onset in adolescent girls.

### *Body Image/Body Dissatisfaction*

An additional psychosocial consequence of weight stigma and obesity is body image. Problems associated with negative body image have received substantial attention given that in the United States there are unrelenting pressures to be thin, particularly for girls (Friedman, Reichmann, Costanzo, Zelli, Ashmore, & Musante, 2002). It is unclear if body image is a unique construct or a component of self-esteem (Pesa, Syre, & Jones, 2000). Due to the inconsistencies regarding body image in the literature and its relationship to self-esteem, additional studies are needed to examine this hypothesis. And the literature indicates that; the female adolescent's self-esteem is heavily dependent upon how she feels about her body (Pesa et al., 2000).

Few empirical studies have assessed what is considered acceptable body size across ethnicity (Cachelin, Rebeck, Chung, & Pelayo, 2002). One component of body image appraisal is how individuals perceive their weight status. Several research studies have evaluated the self-perceptions of weight status/body image among adolescents. For example, Xie et al. (2003) investigated weight perceptions in a sample of Chinese adolescents. Underweight or normal weight girls were more likely to characterize themselves as relatively heavy or very heavy whereas, normal or overweight boys were more likely to see themselves as underweight. These findings of misperceived body

image were associated with psychopathology including depressive symptoms, perceived peer isolation and anxiety (Xie et al., 2003). Furthermore, the inconsistency between perceived weight, body image, and actual weight suggests that body image may have a mediating effect on the relationship between depressive symptoms and body weight (Xie et al., 2003). In a study by Nishizawa et al. (2002), boys more correctly evaluated their own physiques in comparison to girls. In a study by Al-Sendi, Shetty, and Musaiger (2004) the majority of overweight Bahraini adolescent boys perceived themselves to be normal weight. Similarly, a small percentage of obese adolescents actually reported themselves to be obese when in fact they were obese. These findings indicate that a high percentage of obese adolescents are underestimating their actual weight (Al-Sendi et al., 2004). In contrast, in a study by Rinderknecht and Smith (2002,) Native American youth with increasing body mass index selected larger silhouettes to represent their current body size. In addition, the ideal body image increased in size as the youth aged (Rinderknecht & Smith, 2002). This result suggests that Native American youth prefer a heavier ideal image that is not a healthy body shape ideal. Similarly, Gordon-Larsen (2001) reported that African American adolescents preferred a medium sized body shape to support the notion that ethnic minorities are more accepting of a heavier body image than white adolescents. In comparison, normal weight Bahraini adolescents boys selected a heavier body shape whereas normal weight girls selected a thinner image (Al-Sendi et al., 2004). In addition, obese and overweight adolescents' ideal was significantly thinner than their current body image (Al-Sendi et al., 2004).



Discordance between perceived body weight/ body image and actual weight and body image makes youth susceptible for the development of psychopathology. Based on the literature presented here normal weight adolescents overestimate their weight while overweight/obese adolescents underestimate their weight. Interestingly, Native Americans and African Americans prefer larger body shapes with Bahraini boys also selecting a heavier body shape than normal weight Bahraini girls.

Body image has been speculated to be associated with other psychological correlates. For example, Wingood, DiClemente, Harrington, and Davies (2002) reported body dissatisfaction was associated with a lower self-esteem and greater depression in African American adolescents aged 14 to 18. They found that the perceptual component of body image moderated the association between obesity and depression. For example, Pesa et al. (2000) reported that after controlling for the effects of body image, depression was no longer a significant factor in differentiating overweight and nonoverweight adolescents.

The research literature postulates a relationship between eating behaviors and body image. For example, Vander Wal and Thelen (2000) reported that obese children were more likely than their normal weight peers to diet. In addition, obese girls had a higher prevalence of dieting than obese boys. Further, obese children were more concerned with becoming or being overweight compared to normal weight children. An analysis of body image revealed that obese children were more dissatisfied with their bodies with girls expressing more dissatisfaction than boys (Vander Wal & Thelen, 2000). In a study of biracial adolescents, black girls scored significantly higher on the

Bulimia subscale of the Eating Disorders Inventory than white girls, suggesting that black girls are at greater risk for developing binge eating disorder (Striegel-Moore, Schreiber, Lo, Crawford, Obarzanek, & Rodin, 2000). In addition to this finding, bulimia scores increased with increasing body mass index (BMI) (Stice et al., 2002; Striegel-Moore et al., 2000). Striegel-Moore et al. (2000) also report that body dissatisfaction increased as BMI increased in all participants. However, on the Drive for Thinness subscale white girls scored significantly higher than black girls indicating that black girls have a low tolerance for being very thin (Striegel-Moore et al., 2000). Stice and colleagues (2002) reported that increasing BMI, dieting, body dissatisfaction and pressure to be thin predicted greater risk for developing binge eating.

Body dissatisfaction is a common theme in the research literature. However, perceptions of body dissatisfaction differ by ethnicity and gender. For example, Mikkila, Lahti-Koski, Pietinen, Virtanen, and Rimpela (2003) reported that weight dissatisfaction was common among Finnish adolescents, and girls considered themselves more overweight than boys. Similarly, Rinderknecht and Smith (2002) reported that body dissatisfaction was greater in overweight Native American girls. In addition, Al-Sendi and colleagues (2004) reported similar findings in Bahraini adolescent girls with more than half of girls expressing feelings of dissatisfaction with body weight. In a study of affluent Delhi adolescents, adolescents perceived themselves to be heavier than they were and wanted to be thinner (Chugh & Puri, 2001). Body dissatisfaction was common in this study with 96% of obese adolescents indicating dissatisfaction with their appearance (Chugh & Puri, 2001). Thompson and associates (2007) found that at risk for overweight

and overweight U.S. high school girls scored higher than average weight girls did on body dissatisfaction. Thus, overweight and at risk for overweight girls are more dissatisfied with their bodies than their normal weight peers (Thompson, Shroff, Herbozo, Cafri, Rodriguez, & Rodriguez, 2007). In summary, these findings suggest an association between self-esteem, body image, and depression. The literature illustrates that body dissatisfaction is not uniquely an American issue.

### *Self-esteem*

A final psychosocial consequence of obesity and weight stigma may be lower self-esteem. Although obesity may have detrimental consequences for self-esteem, the prevalence and magnitude of this problem are controversial (Strauss, 2000; Zimetkin, Zoon, Klein, & Munson, 2004). Obese youth are believed to be at high risk for developing low self-esteem. Obesity stigmatizes adolescents placing them outside the social norms (Zimetkin et al., 2004). Studies on self-esteem have reported that obese adolescents have moderately lower self-esteem than nonobese peers (Zimetkin et al., 2004). Body image may moderate this effect on self-esteem (Friedman et al., 2002; Pesa et al., 2000). The most consistent replicated finding in these studies is that obese adolescents have a more negative body image than do their non-obese peers (Israel & Ivanova, 2002; Pesa et al., 2000; Zimetkin et al., 2004).

Obesity in adolescents seeking treatment is often more severe than in the general population which may correlate with low self-esteem (Zimetkin et al., 2004). Females appear to have the greatest risk to self-esteem problems. Israel and Ivanova (2002) reported that girls had lower general self-esteem than boys in a sample of boys and girls

presenting for weight reduction treatment. In addition, obese girls reported lower physical self-esteem than obese boy did (Israel & Ivanova, 2002). Overall findings suggest that obese boys and girls increase the emphasis placed on other dimensions of self-esteem thereby reducing the emphasis on physical self-esteem in order to maintain their general self-esteem (Israel & Ivanova, 2002). In a study of clinically obese adolescents and non-clinically obese adolescents, self-esteem was lower in the clinically obese group (Erermis et al., 2004). Contrary to previously reported findings, Erermis et al. (2004) found that obese male adolescents reported lower self-esteem than female obese adolescents did.

Research studies point to a relationship between self-esteem and obesity (Pesa et al., 2000; Strauss, 2000; Stradmeijer, Bosch, Koops and & Seidell, 2000). Lower self-esteem scores were more readily seen in the areas of physical appearance and athletic competence (Stradmeijer et al., 2000). However, in a nationally representative school-based sample Goodman and Whitaker (2002) did not find low self-esteem at baseline to be associated with obesity at follow-up for those who were not obese at baseline.

A relationship between self-esteem and binge eating has been described in the literature. For example, Stice et al. (2002) reported in a sample of high school students that low self-esteem and depressive symptoms predicted binge eating onset. In a study by Decaluwe and colleagues (2003), obese binge eaters had a lower global self-esteem than obese non-binge eaters. Ackard et al. (2003) reported that youth who endorsed binge eating scored lower on the self-esteem scale than youth who reported no overeating. In addition, Ackard and colleagues (2003) found that suicidal thoughts and attempts were more likely endorsed in conjunction with overeating and low self-esteem.

Some research studies have found self-esteem to improve by engaging in physical activity. For example, Barton, Walker, Lambert, Gately, and Hill (2004) found a strong relationship between improvements in thoughts about exercise and physical appearance and global self-esteem. In addition, Strauss, Rodzilsky, Burack, and Colins (2001) found that a high level of physical activity was associated with improvements in self-esteem. This relationship is said to be important because physical activity helps to develop self-esteem in children (Strauss et al., 2001). Some research studies have pointed out that body image moderates the relationship between self-esteem and obesity (Pesa et al., 2000).

#### *Self-reported height and weight*

Most of the articles in the literature have relied on self-report measures to ascertain, weight stigma, self-esteem, depressive symptoms, body image, height and weight. Traditionally self-reported height and weight has been used to calculate body mass index (BMI). The use of self-reported height and weight has been scrutinized for its reliability and validity. Several studies have evaluated the reliability and validity of self-reported height and weight. Brener and colleagues (2003) assessed the reliability and validity of self-reported height, weight and BMI calculated from self-reported values among adolescents. The authors reported kappa's of 0.77 and 0.87 for at-risk for overweight and overweight classification, respectively of a convenience sample of adolescents (Brener, McManus, Galuska, Lowry & Wechsler, 2003). Whereas, classification into three categories (overweight, at risk for overweight and neither) was moderate agreement (kappa = 0.48). The correlation between self reported height and

weight and measured height and weight were 0.90 and 0.93, respectively. Further, the correlation between self-reported and measured BMI was 0.89 (Brenner et al., 2003). Another study examining the reliability and validity of self-report height and weight among school age children in Wales found correlations between self-reported and measured weight, height and BMI was high for both girls and boys. The correlations ( $r$ ) were the following for boys 0.94, 0.87 and 0.88 for weight, height and BMI, respectively (Elgar, Roberts, Tudor-Smith & Moore, 2005). Similarly, the correlations for girls were 0.95, 0.76, and 0.88 for weight, height and BMI, respectively (Elgar et al., 2005). Again in a study of female college students in the Netherlands Larsen, Ouwens, Engels, Eisinga, & van Strien (2008) found positive high correlations for height, weight and BMI. All correlations were greater than 0.90. Height, weight, and BMI correlations ( $r$ ) were 0.96, 0.96, and 0.94, respectively (Larsen et al., 2008). In addition, Tokmakidis, Christodoulos, & Mantzouranis (2007) found high correlations between self-reported and measured height, weight and BMI among school aged Greek children. The correlations ( $r$ ) were 0.91, 0.96 and 0.90 for height, weight and BMI, respectively (Tokmakidis et al., 2007).

#### *Possible Moderators of Weight Stigma*

According to Baron and Kenny (1986) and James and Brett (1984) a moderator is a third variable that influences the relationship between two or more other variables and is a function of the third variable. A moderator is a qualitative or quantitative variable that affects the strength and/or direction of the relationship between a predictor and criterion variable (Baron & Kenny, 1986). Simply stated, a moderator is an interaction between the predictor and criterion variable. On the other hand, a mediator accounts for

the relationship between the predictor and criterion variable. The mediator specifies how or why an effect occurs (Baron & Kenny, 1986). The predictor causes the mediator and in turn, the mediator causes the criterion variable. In addition, for a variable to function as a mediator the following conditions must be met: (1) variations in the predictor accounts for variations in the mediator, (2) variations in the mediator accounts for variations in the criterion, and (3) a previously significant relationship between the predictor and criterion is no longer significant (p. 1176) (Baron & Kenny, 1986). As outlined by Baron and Kenny (1986) moderators were tested according to the level of measurement of both the predictor and moderator. For instance, a dichotomous predictor and moderator were tested using a 2 X 2 ANOVA. Whereas, testing moderation with a continuous predictor and dichotomy moderator was done by correlating the moderator and predictor (Baron & Kenny, 1986). The procedure outlined by Baron and Kenny (1986) for testing mediation is as follows: first, regress the mediator on the predictor variable; second, regress the criterion on the predictor; and third, regress the criterion on both the predictor and mediator.

The controllability of stigma affects the meaning of situations for self-evaluation (Crocker & Quinn, 2000). In a study by Amato and Crocker (1995) as cited by Crocker & Garcia (2005) women were recruited for a study of dating relationships. The women completed a battery of questionnaires after height and weight measurements were obtained. The women were seated in a room with a one-way mirror. The women completed a form describing themselves for the male evaluator. Each woman received a similar form filled out by the man. To test the controllability of weight the investigators

had the women in the study read an article about the scientific causes of overweight written by the Surgeon General. Half of the participants read that weight was controllable through diet and exercise while the other half read the same article stating that weight was difficult to control through diet and exercise and was a function of genetics. After reading the article, the participants were asked to answer questions about it. Then all participants learned the fictitious male evaluator was not interested in dating them. The results showed that women who read that weight was controllable believed weight was more controllable than women who read weight was not controllable. More importantly, overweight women in the uncontrollable condition were more likely to attribute rejection to the evaluator's prejudice than a woman in the controllable weight condition regardless of actual weight status. Overweight women in the uncontrollable condition and normal weight women in the controllable condition had higher self-esteem than overweight women in the controllable condition and normal weight women in the uncontrollable condition. Stated differently, overweight women with no control over their weight and normal weight women with control over their weight had higher self-esteem than overweight women with control over their weight and normal weight woman with no control. In the context of being rejected for a date, the self-esteem of overweight and normal weight depended on the information about the controllability of weight (Amato & Crocker, 1995 as cited by Crocker & Garcia, 2005). In summary, the controllability of weight influences whether or not the individual will experience negative psychosocial outcomes.



Social support was hypothesized to moderate weight stigma. Boulton, Trueman, Chau, Whitehead, & Amatya (1999) found that students with friends at the beginning of the study and 6 months later experienced less victimization than students without friends at both time points. This finding suggests that friends buffer the effects of victimization (Boulton et al., 1999). Rigby (2000) examined the possible buffering effects of social support in bullying experiences. Specifically, the authors hypothesized that social support would be greatest in cases of frequent bullying (Rigby, 2000). The author found low correlations between degree of peer victimization and social support (Rigby, 2000). The author found no evidence to support the buffering effects of social support, therefore, students victimized more did not benefit more or less from high levels of social support (Rigby, 2000). Although, the results did not support the buffering effects of social support, students who lack social support were more susceptible to bullying (Rigby, 2000). In summary, there is disagreement regarding the buffering role of social support.

#### *Meditational and Moderational Model Testing*

Different studies have used various methods to test meditational and moderational effects in research. In a discussion of theoretical and methodical differences between mediators and moderators, Lindley and Walker (1993) suggested centering continuous predictor and moderator. Centering involves subtracting the sample mean from the variable creating a centered deviation score with a mean of zero. According to Lindley and Walker (1993) hierarchical multiple regression of an outcome with centered predictor and moderator can be used for a continuous moderator and dichotomous predictor, continuous predictor and moderator, or categorical moderator and continuous predictor.

In this article, mediation was tested using the steps outlined by Baron and Kenny (1986). Holmbeck (1997) presented strategies for testing moderation and mediation using both regression and structured equation modeling. It is preferred to use variables in their continuous form for regression. Structured equation modeling is preferred over regression when there is more than one indicator for the constructs assessed (for a more detailed discussion see Holmbeck, 1997).

Eckenrode, Rowe, Laird, and Brathwaite (1995) tested mobility as a mediator in the effects of child maltreatment and academic performance. The authors hypothesized that maltreated children would have higher levels of residential mobility and school transfers than their nonmaltreated counterparts. The authors also predicted that mobility would be a mediator linking child maltreatment to poor school performance. Eckenrode and colleagues (1995) used regression to explore the moderating effects, including interactions between maltreatment and mobility. The mediating role of mobility was tested using regression analyses to predict mobility as a function of maltreatment. Path analysis was used to decompose the overall effect of maltreatment into direct and indirect effects with mobility as the mediating variable (Eckenrode et al., 1995).

In a study exploring the unique and joint effects of family functioning and self-concept on the severity of adolescent problem behaviors in a clinical sample of drug abusing adolescents, the authors sought to predict severity of adolescent externalizing problems from family functioning and self-concept (Henderson, Dakof, Schwartz, & Liddle, 2006). The authors hypothesized that a joint effect of family functioning and self-concept would predict externalizing problems as demonstrated by mediation or

moderation (Henderson et al., 2006). To test the moderation model the authors created an interaction term composed of family functioning and self-concept and implemented in the Mplus software (Henderson et al., 2006). For the meditation analysis, the authors followed the steps outlined by Baron and Kenny (1986) and Holmbeck (1997).

Raver, Gershoff, and Aber (2007) tested whether models of multiple mediating pathways predicting income to school readiness differed for Black, Hispanic and White families. The authors also tested if predictors, outcomes, and mediators were variant or invariant in measurement across three ethnic groups. The authors used omnibus tests of factorial invariance for the mediating constructs of positive parenting behavior and parental investment (Raver et al., 2007). Mediation was tested following a series of steps outlined by Baron and Kenny (1986) and Holmbeck (1997).

Hankin, Mermelstein, & Roesch (2007) studied differences in boys and girls experience of stressors and interpersonal events and whether additional stressors would mediate gender differences in adolescent depression. To test this mediational hypothesis the authors used the Baron and Kenny (1986) approach. To test the moderation model of stress reactivity the authors used hierarchical linear modeling (Hankin et al., 2007).

In a study testing a helplessness model of depression applied to problem drinkers, the authors tested a moderation model of helplessness and alcohol dependence and the relation between alcohol dependence and depression (Sitharthan, Hough, Sithartan, & Kavanagh, 2001). To test the moderation model the authors used hierarchical multiple regression (Sitharthan et al., 2001). In addition, the authors tested a mediation model of

helplessness and self-efficacy on the severity of alcohol dependence and depression using path analysis (Sitharthan et al., 2001).

Wadsworth, Raviv, Compas, and Connor-Smith (2005) tested two competing models of coping and stress response for adolescents and parents to see whether responses to stress act as mediators or moderators in the relation between economic stress and psychological symptoms. In a study examining negative affect, coping motives, and alcohol-related problems in a sample of Red Cross volunteer staff following the September 11 terrorist attacks (Gaher, Simons, Jacobs, Meyer, & Johnson-Jimenez, 2006), the authors tested two competing models of coping motives, mediation and moderation models to determine the best fitting model. In both of the studies mentioned above the authors used regression to test the two competing models of moderation and mediation. In a study by Boman and Enmarker (2004), the authors tested if different factors mediated or moderated the annoyance response. To test both the mediation and moderation model the authors used structural equation modeling (Boman & Enmarker, 2004).

In summary, testing mediation and moderation models researchers have used a variety of methods. The most accepted and utilized method for testing mediation is the Baron and Kenny (1986) approach. The greatest variation is in moderation testing. In most of the research presented, the authors used regression to test the moderation hypotheses. The literature illustrates that the research hypothesis dictates which analytic strategy is most appropriate.

This literature summarized the psychosocial effects associated with weight stigma and obesity. Clearly, the literature illustrated that those individuals that are overweight and obese experience weight-based stigmatization at all ages and in all areas of life. The consequences experienced because of weight stigma are depressive symptoms, body dissatisfaction and lowered self-esteem.

Chapter 3 outlines the design of the study, the measures included in the online survey, the procedure of the study and the planned analysis of the relationships specified in the logic model. In addition, a description of the population in which the sample was recruited is described and the power analysis is presented.

## CHAPTER THREE

### Methods

#### *Design*

This was a non-experimental exploratory correlational study using web-based survey methods.

#### *Sample*

The study population consisted of undergraduate students attending the University of South Florida (USF) Tampa campus. In Fall 2008, there were 28,846 undergraduate students of all ages enrolled at USF Tampa campus (USF Infomart, 2004). Inclusion criteria: Students who were currently taking undergraduate courses at USF, who were between the ages of 18 and 21, were able to read and understand English, who had access to the internet and were able to use a computer proficiently to complete the online survey. Exclusion criteria: Students who were enrolled in Graduate level study at USF, students younger than 18 and older than 21 years of age, students without access to a computer with internet access, students who were unable to read and understand English, and were unable to use a computer proficiently to complete the online survey. Students were recruited via email.

Three primary methods of analysis were employed: multiple linear regression, linear mediational models following the framework described by Baron and Kenny (1986), and exploratory factor analysis. In addition, as stated in the secondary aims, potential moderating effects of perceived control and social support on the relationships

between weight stigma and psychosocial health and self-esteem were evaluated. Issues germane to sample size estimation for these methods are described below:

Given the large number of statistical models to be fit, we assumed a type I error rate (alpha level) of 0.01 rather than the conventional 0.05 to account for multiple comparisons. The magnitude of effect sizes ( $d$ ) suggested by Cohen (1988) as: "small,  $d = .2$ ," "medium,  $d = .5$ ," and "large,  $d = .8$ " were considered. Our goal was to detect "medium" effect sizes or smaller for all analyses with sufficient power.

For multiple linear regression analyses (i.e., Research Questions 1 and 2), a "medium" effect size was defined as a change in  $R^2$  of 5.0%. Assuming control of three covariates with aggregate  $R^2$  of 20.0% and type I error rate of 0.01, a sample size of 179 subjects provided 80% power to detect a change in  $R^2$  of 5.0% attributed to the independent variable of interest (e.g., measure of weight). Thus, for subgroup analyses (i.e., moderator variables), it assumed that 25% of all subjects resided in the small subgroup, thereby suggesting a total sample size of 716 subjects (i.e.,  $716 \times 0.25 = 179$ ).

For the proposed exploratory factor analyses, guidelines for this large scale procedure recommend the minimal number of subjects (observations) to be the larger of 100 subjects or 5 times the number of variables being analyzed (Hatcher, 1994). In the proposed factor analysis, no more than 10 variables being simultaneously assessed were anticipated, thus the proposed sample size of 716 subjects (defined above) were well powered for this analysis.

Finally, the linear meditational analyses were performed in framework of regression modeling. As previously noted (e.g., Freedman, 2001), estimating the

proportion of an independent-dependent variable relationship that is mediated by a third variable is often unstable unless the sample size is at least 500 subjects. Thus, the proposed sample size of 716 subjects adequately powered meditational analyses.

### *Measures*

An online questionnaire containing the Rosenberg Self-Esteem Scale, Life Experiences Scale, Contour Drawing Rating Scale, Patient Health Questionnaire (PHQ 9), Perception of Teasing Scale, Gatehouse Bullying Scale, Multidimensional Scale of Perceived Social Support and State Self-esteem Scale were administered to participants. Demographic data including age, gender, ethnicity, race, weight, height, major in college, and year in college were collected.

*Demographic Data.* Participants were asked to indicate their current age. Race and ethnicity were assessed by asking participants to select one of the following categories they self identify: African American (Black), Caucasian, Hispanic/Latino, Asian, American Indian, or other. Participants were asked to state their height in inches. Participants were asked to select their current year in college from the following: Freshman (1<sup>st</sup> year), Sophomore (2<sup>nd</sup> year), Junior (3<sup>rd</sup> year), or Senior (4<sup>th</sup> year).

*Predictor Variables.* Actual weight was measured by asking participants to self-report their current weight in pounds. Perceived weight was measured by asking participants to select their current weight from one of the following: underweight, normal weight, overweight, or obese.

*Possible Mediators and Moderators.* Self-esteem was measured using the *Rosenberg Self-Esteem Scale* (SES) (Rosenberg, 1965). The SES is a 10-item self-report



measure of global self-esteem. It consists of 10 statements related to overall feelings of self worth or self-acceptance. The scale is a unidimensional measure and is scored using a 4-point response format (strongly agree, agree, disagree, and strongly disagree). The scores range from 10 to 40, with higher scores representing higher self-esteem.

*SES Reliability.* The Cronbach's alpha of the scale ranges from .77 to .88. The test-retest correlation was 0.85 after a 2-week interval and 0.88 after a 1-week interval (Blascovich & Tomaka, 1991). The Rosenberg Self-esteem scale has been used extensively in a variety of populations, including college students. In a study of 246 college women the scale had high reliability with a Cronbach's alpha in this sample of 0.89 (Peden, Hall, Rayens, & Beebe, 2000). There is no known validity data for the SES.

The *State Self-Esteem Scale* (SSES) was used in conjunction with the Rosenberg Self-esteem Scale to measure state self-esteem and acute fluctuations in self-esteem. The SSES is a multidimensional 20-item self-report scale, which measures three areas: performance, social, and appearance. Each item is scored on a 5-point scale (1 = not at all, 2 = a little bit, 3 = somewhat, 4 = very much, and 5 = extremely). However, for this study a 4-point scale was used (1 = not at all, 2 = a little bit, 3 = somewhat and 4 = very much). Scores can range from 20 to 80 (Heatherton & Polivy, 1991).

*SSES Validity.* The initial validity study assessed 428 undergraduate and 102 undergraduate volunteers. Validity of the scale was assessed comparing the SSES score and subscales to the Janis-Field Feeling of Inadequacy Scale (JFS) and Restraint Scale. The SSES compared to JFS and Restraint scale correlations were 0.80 and -0.30 respectively (Heatherton & Polivy, 1991). Principal component analysis revealed three

factors that accounted for 50.4% of the overall variability in scores (Heatherton & Polivy, 1991).

*SSES Reliability.* The scale has a high degree of internal consistency coefficient  $\alpha = 0.92$  (Heatherton & Polivy, 1991).

Perceived control over weight was measured by asking the participants how much control they perceived they had over their current weight on a scale of 0-10 with zero indicating no control and 10 indicating total or complete control.

The *Multidimensional Scale of Perceived Social Support* (MSPSS) measured perceived social support. The MSPSS is a 12-item rating assessing the perceived adequacy of support from three sources: family, friends, and significant other (Zimet, Dahlem, Zimet, & Farley, 1988). The 12-item ratings of the MSPSS are scored on a 7-point Likert-type scale ranging from very strongly disagree (1) to very strongly agree (7) (Zimet et al., 1988).

*MSPSS Validity.* The initial validity of the MSPSS was assessed using 275 Duke University undergraduate students. Construct validity was assessed by examining the correlations between the MSPSS subscales and the depression and anxiety subscales of the HCSL. Perceived support from family was significantly inversely correlated to depression and anxiety,  $r = -0.24$  and  $-0.18$   $p < .01$ , respectively (Zimet et al., 1988). Perceived support from friends was negatively correlated with depressive symptoms ( $r = -0.24$ ), but not anxiety. Perceived social support from a significant other was minimally inversely correlated with depression,  $r = -0.13$ , as was the scale as a whole,  $r = -0.25$  (Zimet et al., 1988). Another study by Zimet, Powell, Farley, Werkman and Berkoff

(1990) extended the findings of the initial study using three different samples: pregnant women, high school students abroad, and pediatric residents. The construct validity of the three subscales has been demonstrated in the literature (Dahlem, Zimet, & Walker, 1991; Zimet et al., 1988; Zimet et al., 1990).

*MSPSS Reliability.* Cronbach's alpha for the scale as a whole was 0.88. The Cronbach's alpha for the significant other, family, and friends subscales were 0.91, 0.87, and 0.85, respectively (Zimet et al., 1988). Sixty-nine participants were retested two to three months after initially completing the questionnaire. The test-retest reliability for the three subscales significant other, family, and friends were 0.72, 0.85, and 0.75, respectively. For the whole scale, the value was 0.85 (Zimet et al., 1988). The Cronbach's alpha for pregnant women, adolescents, and residents were 0.92, 0.84, and 0.90, respectively for the entire scale (Zimet et al., 1990). The MSPSS is psychometrically sound in diverse populations with good internal reliability and test-retest reliability (Bruwer, Emsley, Kidd, Lochner, & Seedat, 2008; Canty-Mitchell, & Zimet, 2000; Dahlem et al., 1991; Zimet et al., 1988; Zimet et al., 1990).

*Weight Stigma.* Victimization was measured using the *Perception of Teasing Scale* (POTS) and the *Gatehouse Bullying Scale* (GBS). The POTS is an 12-item scale that measures weight and appearance related teasing using a 5-point scale 1 (never), 2 (rarely), 3 (sometimes), 4 (often), and 5 (very often) during childhood and adolescence (ages 5-16) (Thompson, Cattarin, Fowler, & Fisher, 1995). For this study, the Weight-related teasing scale of the POTS was used. Thompson and colleagues (1995) conducted three studies to evaluate the psychometric properties of the POTS.

*POTS Validity.* The scale was developed using 227 female undergraduate students. Factor analysis using a promax oblique rotation was performed on 35 items. The scree plot and eigenvalues (9.86, 3.53, & 1.67) indicated three factors. The final questionnaire consisted of six weight-teasing items and five competency items (Thompson et al., 1995). In a similar study using 87 college women factor analysis using promax oblique rotation revealed two factors (eigenvalues 4.27 and 1.98) respectively accounting for 38.8% and 18% of the variance (Thompson et al., 1995). Convergence validity of the POTS and measures of body image, eating disturbances, and self-esteem were assessed. The relationship between weight teasing and body image was strongly correlated with correlations ranging from 0.39 to 0.48. Correlations between weight teasing and eating disturbances ranged from 0.22 to 0.35. The relationship between weight teasing and self-esteem was negatively correlated with correlations ranging from -0.18 to -0.27 (Thompson et al., 1995).

*POTS Reliability.* Internal consistency as indicated by the Cronbach's alpha was 0.88 for Weight-Related Teasing scale and 0.84 for the Competency Teasing scale (Thompson et al., 1995). The Cronbach's alpha obtained in the second study by the authors was 0.88 for Weight-Related Teasing and 0.75 for Competency Teasing. In a third, study by the authors using 92 undergraduate women the POTS was tested for convergence with measures of body image, eating disturbances, and self-esteem. Fifty participants were retested at 2-weeks to assess test-retest stability. The test-retest reliabilities for the four scales were the following: weight teasing-frequency, 0.90;

Weight-teasing-effect, 0.85; Competency teasing-frequency, 0.82, and Competency teasing-effect, 0.66 (Thompson et al., 1995).

The *Gatehouse Bullying Scale(GBS)* assesses overt and covert types of victimization. The 12-item scale asks participants whether they have been (1) called names or teased, (2) had rumors spread about them, (3) been deliberately left out of things, and (4) recently been threatened or hurt (Bond, Wolfe, Tollit, Bulter, & Patton, 2007). Respondents were considered being bullied if they responded “yes” to one or more items and were bullied frequently if they indicated they had experienced one or more types of bullying on “most days” (Bond et al., 2007). For this study the GBS was modified to include weight in the stem of the question to assess weight-related victimization.

*GBS Validity.* Concurrent validity of the GBS was compared to the Peer Relations Questionnaire (PRQ) using 2414 middle school students. The prevalence of bullying was higher for the PRQ (60.8%) than the GBS (56.6%). Teasing prevalence was 52.8% and 45.8% for the PRQ and GBS, respectively. The PRQ had higher rates for all items than the GBS. The percent of agreement between the two scales ranged from 75.6% to 90.1% with the corresponding Kappas ranging from 0.42 to 0.58. Therefore, there was moderate agreement between the PRQ and GBS for bullying (Bond et al., 2007).

*GBS Reliability.* Forty-eight students were used for a 3-week test-retest. The prevalence of bullying and other behaviors decreased after 3 weeks. Fifty percent were bullied and 33.3% were teased at time one. In addition, 12.5% were left out of things on purpose, 10.4% were threatened or hurt and 25% had rumors spread about them at time

one. In comparison 35.4% were bullied, 31.3% were teased, 12.5% were left out of things, 6.3% were threatened or hurt, and 10.4% had rumors spread about them at time two. The percent of agreement ranged from 81.3% to 91.7% between data collection points with Kappas ranging from 0.36 to 0.63 and Spearman's Rho ranging from 0.44 to 0.65 showing moderate to good agreement of the GBS over time (Bond et al., 2007). A Cronbach's alpha was established for the present study.

Discrimination was measured using the *Life Experiences Scale* (Williams, Yu, Jackson, & Anderson, 1997). The *Life Experiences Scale (LES)* is a 10-item scale that inquires about daily experiences and asks the respondent to select the reason for the experiences from a list of eleven possible reasons. The scale assesses the frequency of the 10 situations on a daily basis. Each item is scored on a 4-point scale (1 = often, 2 = sometimes, 3 = rarely, and 4 = never). Scores can range from 10 to 40 (Krieger, Smith, Naishadham, Hartman, & Barbeau, 2005).

*LES Reliability.* The scale has a Cronbach's alpha of 0.88 (Krieger et al., 2005). Validity data for the *Life Experiences Scale* is unknown.

*Criterion Variables.* Body image and satisfaction will be measured using the *Contour Drawing Rating scale (CDRS)* developed by Thompson and Gray (1995). The Contour drawing scale consists of nine figures representing a monotonic increase in percent size from the first to ninth silhouette of a male and a female. A modified version of the scale asking the participant to choose the best representation of how they "think" they look (cognitive), how they "feel" they look (emotional), and how they "want" to look (ideal).

*CDRS Validity.* Validity was assessed by appropriately ordering the drawings. Of the 459 responses for each set of drawings, 95.2% and 96.1% correctly positioned drawings for the female and male set of drawings, respectively (Thompson & Gray, 1995). Upon test-retest, evaluation of the rank ordering procedure correctly positions drawings increased to 97.6% and 97.8% for female and male drawings. Rating percentages in agreement with the ascending sequence of the standard arrangement was 97.6% and 98.0% for female and male set of drawings, respectively (Thompson & Gray, 1995).

Test-retest revealed an increase to 98.9% and 98.7% in correct sequencing for female and male drawings (Thompson & Gray, 1995). Additional analysis of percentages revealed that male and female drawings identified as anorexic were only thin and never large: male anorexics ranged from drawings 1-3 (96.1%, 78.4%, 13.7%), whereas female anorexics ranged from drawings 1-4 (98.0%, 86.3%, 17.6%, 2.0%). Likewise, only larger drawings were rated as obese: obese men were identified as drawings 7-9 (17.7%, 51.0% and 88.2%) as was the case with obese women and the female drawings (15.7%, 53.0% and 90.2%) (Thompson & Gray, 1995). Concurrent validity was examined by the degree of correspondence between a participants' reported weight and current self-ratings. The contour drawing rating scale was strongly correlated with perceived body size, ( $r=.71$ ,  $p<.0005$ ). Concurrent validity was also assessed between self-ratings and Quetelet's body mass index (BMI) which yielded similar results ( $r=.59$ ,  $p<.0005$ ) (Thompson & Gray, 1995). The Contour Drawing Rating Scale has been validated in college students.

*CDRS Reliability.* Test-retest of the contour drawing rating scale conducted with a sample of 32 participants with a one-week intervening period revealed a Pearson correlation for current body size of  $r = 0.78$  and was significant,  $p < .0005$  (Thompson & Gray, 1995).

Depressive symptoms was measured using the *Physician Health Questionnaire 9*. The PHQ-9 is a 9-item self-report measure of depressive symptoms in which participants were asked to rate how they felt in the previous 2 weeks. Each question is scored 0 to 3 (0 = not at all, 1 = several days, 2 = more than half the days, and 3 = nearly every day) with a resulting score range of 0 to 27. The nine items reflects the DSM-IV criteria for major depressive disorders (Kroenke, Spitzer, & Williams, 2001; Spitzer, Kroenke, & Williams, et al., 1999).

*PHQ-9 Validity.* The PHQ-9 discriminates well between persons with and without major depression ( $r = 0.95$ ) compared to the 5-item mental health scale of the SF-20 ( $r = 0.93$ ) (Kroenke, Spitzer, & Williams, 2001). Criterion validity was assessed against an independent mental health professional interview in a sample of 580 patients. The correlation between the PHQ and mental health professional interview for this index was 0.84 (Spitzer, Kroenke, & Williams, et al., 1999). Construct validity of the PHQ-9 was examined in association with the SF-20 scale. The PHQ-9 correlated most strongly with the mental health scale (0.73), followed by general health perceptions (0.55), social functioning (0.52), role functioning (0.43), physical functioning (0.37), and bodily pain (0.33) (Kroenke, Spitzer, & Williams, 2001). Further construct validity of the association between PHQ-9 severity level and self-reported disability days (0.39), clinic visits (0.24),



and general amount of difficulty patients attribute to their symptoms (0.55) (Kroenke, Spitzer, & Williams, 2001). The PHQ-9 has been validated in college students. The concurrent validity was determined in association with Beck Depression Index scores ( $r = 0.67$ ,  $p < 0.001$ ) (Adewuya, Ola & Afolabi, 2006).

*PHQ-9 Reliability.* The internal consistency was excellent with a Cronbach's alpha of 0.89 in the PHQ Primary care study and 0.86 in the PHQ OB-GYN study. Test-retest reliability was superb. Correlation between the PHQ-9 completed by the patient in the clinic and that administered by telephone by the mental health professional within 48 hours was 0.84 and the mean scores were nearly identical (5.08 vs. 5.03) (Kroenke, Spitzer, & Williams, 2001). The test-retest reliabilities of the PHQ-9 were  $r = 0.81$  and  $r = 0.96$  indicating excellent reproducibility among a sample of 434 IMPACT intervention participants (Lowe, Unutzer, Callahan, Perkins, & Kroenke, 2004). The internal consistency of the PHQ-9 in sample of Nigerian college students was 0.85 with a test-retest correlation of 0.894 ( $P < 0.001$ ) (Adewuya, Ola & Afolabi, 2006).

#### *Order of Instruments*

The instruments in the survey were presented in the following order: demographics, actual weight, perceived weight, perceived control, Multidimensional Scale of Perceived Social Support, Rosenberg Self-esteem Scale, Perception of Teasing Scale, Gatehouse Bullying Scale, Life Experiences Scale, State Self-esteem Scale, Contour Rating Drawing Scale and Physician Health Questionnaire-9. The order of the instruments was based on the research literature and the principal investigator's reasoning. First, the demographic data conveyed who completed the survey. Second, the

individual indicated their actual weight and then selected their perceived weight the rationale for using both is that how an individual perceives their current weight is a better predictor of self-esteem than actual weight (Miller & Downey, 1999). Next, the participant was asked to gauge how much control they had over their weight. The degree of control over weight can lead to changes in their self-esteem given the collective representations they have about the controllability of weight (Crocker & Quinn, 2000). Then self-esteem was assessed. According to the literature, self-esteem is thought to be a stable trait that individuals carry with them from situation to situation (Crocker & Quinn, 2000). Next perceived social support is said to buffer stigmatizing and victimizing situations therefore social support must precede the weight stigmatization items (Boulton et al., 1999). Then the measures of weight victimization and discrimination were presented to manipulate the salience of self-relevant information to see if it leads to changes in state self-esteem (Crocker & Quinn, 2000). These measures were followed by the state self-esteem measure. According to the literature, self-esteem is constructed as a function of the meaning the situation has for the self. Therefore, the scale detected acute changes in self-esteem from recalling experiences of weight stigma (Crocker, 1999; Crocker & Quinn, 2000; Heatherton & Polivy, 1991). Finally, body image and depression followed state self-esteem. Body image is said to predict psychological effects such as depressive symptoms (Xie et al., 2003). Therefore, body image followed the state self-esteem scale and depressive symptoms round out the measures due to the relationship between body image and depressive symptoms.

### *Procedure*

Institutional Review Board (IRB) approval was sought from the University of South Florida for the protection of human subjects. There was no random assignment of participants or surveys. The survey was anonymously administered online. The survey could be taken at any time during the study period online using the email link provided by the principal investigator. The survey was available from October until January. The survey took approximately 30 minutes to complete. Upon receiving IRB approval, the email listserv of undergraduate students was requested from the University of South Florida registrar's office.

### *Survey Procedure*

The online survey was created using Checkbox web survey software (Prezza Technologies, 2007). Participants were emailed the web address to the survey in order to participate. Once the participants selected the provided link to the survey the informed consent appeared. The participant had to select yes or no to consent to participate. Participants electing to participate by selecting yes were directed to the survey. Participants choosing not to participate were directed to the thank you page of the survey. After the participant completed and submitted the survey a page appeared asking participants if they would like to be entered into a drawing. If participants choose to enter the drawing, they selected a link provided to go to a separate page from the survey to provide their contact information in order to be entered into the drawing. In addition, a list of mental health counselors and providers were provided at the end of the survey for use by participants. Of the participants who provided their name and address at the end of

the survey 20 received a gift certificate mailed to them to be redeemed at local businesses near USF. No connection existed between survey responses and contact information.

After the survey was created in Checkbox it was pilot tested using 54 graduate students from the College of Nursing to get feedback about the survey design, ease of completing the survey, approximate time to complete the survey and the order of questions presented. The feedback from the respondents was used to make changes in the survey presentation.

#### *Preliminary analysis*

Prior to hypothesis testing, weight status, weight stigma, self-esteem, and psychosocial health variables were examined for accuracy of data entry, missing values, and fit between their distributions and the assumptions of multivariate analysis.

Frequencies were ran to look for univariate outliers. Data was not transformed given the assumptions were met.

Simple Pearson correlations were computed to assess the associations among the variables. Only the principal investigator and members of the dissertation committee had access to the raw data. All IRB protocols were followed in this study. If the normality assumption was met, Pearson correlations were ran. The distribution of the data was normal, and a nonparametric correlation such as Spearman Rank order was not computed. Multiple regression was used to analyze hypothesized relationships

#### *Data Analysis Plan*

The data analysis plan corresponds directly with the proposed specific aims and research objectives and hypotheses. At the broadest level, analyses were carried out to:

- 1) Assess the interrelationships between the 4 research domains of interest: (i) weight status; (ii) weight stigma; (iii) self-esteem; and (iv) psychosocial health
- 2) Among each interrelationship identified, determine the measure within each respective domain that provides the greatest predictive power (model fit).

The four domains of interest are listed below in Table 1 along with the measures to be administered and evaluated within each domain:

Table 1

Domains and Measures

	Domain	Measure 1	Measure 2
1	Weight Status	Actual Weight	Perceived weight
2	Weight Stigma	Victimization	Discrimination
3	Self-esteem	Trait self-esteem (SSE)	State self-esteem (SSE)
4	Psychosocial health (PH)	Depressive symptoms	Body image

Research Question #1. *To what extent are measures of weight status associated with measures of psychosocial health?*

For this analysis, a 6 x 6 correlation matrix (Pearson r) consisting of actual weight, perceived weight, discrimination, victimization, body image and depressive symptoms and then 4 separate linear regression models were fit to identify the strongest independent relationship between measures of weight status and psychosocial health. The four linear regression models that were fit had the following form:

$$Y = \beta_0 + \beta_1 X_1 + \beta_i Z_i + \varepsilon.$$

where

- Y = dependent variable (i.e. psychosocial health)
- $\beta_0$  = model intercept
- $\beta_1$  = regression coefficient for the independent variable (i.e. weight status)
- $x_1$  = observed value of the independent variable (i.e. weight status)
- $\beta_i$  = regression coefficients for all covariates included in the model
- $Z_i$  = observed values of all covariates included in the model
- $\varepsilon$  = random error

The dependent (Y) and independent ( $X_1$ ) variables for the four models are listed below in Table 2.

Table 2

Models of Psychosocial Health and Weight Status

Model	Dependent variable	Independent variable
1	Depressive symptoms	Actual weight
2	Depressive symptoms	Perceived weight
3	Body image	Actual weight
4	Body image	Perceived weight

Based on the correlations and regression equations if indicators are similar and strong scores were averaged together by converting each measure to a z score and averaging the two to form a composite score for each domain. These composite scores will have a mean of zero and a standard deviation of one.

Research Question #2. *To what extent are measures of weight stigma associated with measures of psychosocial health?*

This analysis will follow the same process as that proposed for Research Question #1 with the following (see Table 3) dependent (Y) and independent ( $X_1$ ) variables.

Table 3

Models of Psychosocial Health and Weight Stigma

Model	Dependent variable	Independent variable
1	Depressive symptoms	Victimization
2	Depressive symptoms	Discrimination
3	Body image	Victimization
4	Body image	Discrimination

Research Questions #3 and 4. *To what extent do measures of self-esteem mediate the relationship between (1) weight status and psychosocial health and (2) weight stigma and psychosocial health?*

These analyses will follow the framework described by Baron and Kenny (1986) to test both direct and indirect effects between independent and dependent variables (i.e. the analyses described in Research Questions 1 and 2). As stated previously if both indicators of the predictor (construct) are significant in predicting the relationship based on the correlation matrix and regression equation both will be used in subsequent analyses. Otherwise, one measure of the indicator will be used by forming a composite score of the indicators of the measures. Formal statistical testing will occur by use of the Sobel test. For these analyses, the best fitting models identified in Research Questions 1 and 2 will be used to assess the mediating effects of self-esteem, whether as trait self esteem or state self-esteem (i.e. refer to the logic model). For the relationship between weight status and psychosocial health, there will be 4 mediating models (see Table 4). These will include 2 models which use the best measure of weight status (actual or

perceived weight) in relation to depression symptoms, as mediated by either trait self-esteem or state self-esteem. Similarly, there will be 2 models which use the best measure of weight status (actual or perceived weight) in relation to body image, as mediated by either trait self-esteem or state self-esteem. A parallel process of 4 models (see Table 5) will be used to assess self-esteem as a mediator of the relationship between weight stigma and psychosocial health.

Table 4

Mediator Models between Best measure of Weight Status and Self-esteem

Model	Independent variable	Mediator	Dependent variable
1	Best measure of weight status	Trait self-esteem	Depressive symptoms
2	Best measure of weight status	State self-esteem	Depressive symptoms
3	Best measure of weight status	Trait self-esteem	Body image
4	Best measure of weight status	State self-esteem	Body image

Table 5

Mediator Models between Best measure of Weight Stigma and Self-esteem

Model	Independent variable	Mediator	Dependent variable
1	Best measure of weight stigma	Trait self-esteem	Depressive symptoms
2	Best measure of weight stigma	State self-esteem	Depressive symptoms
3	Best measure of weight stigma	Trait self-esteem	Body image
4	Best measure of weight stigma	State self-esteem	Body image



In an effort to guide the analysis to determine if the indicators are interchangeable, an exploratory factor analysis with a one factor solution was conducted to examine whether the weight stigma variables (bullying, victimization and discrimination) are similar or different and how much relative influence each indicator adds to predicting the relationships specified.

Research Question #5. *To what extent do measures of weight stigma mediate the relationship between weight status and self-esteem?*

This analysis will be identical to that of Research Question #3 & 4 with the exception of having self-esteem serve as the dependent variable of interest and weight stigma as a potential mediator between weight status and self esteem. The specific models to be fit are listed below in Tables 6 and 7.

Table 6

Meditational Models between Actual Weight and Weight Stigma

Model	Independent variable	Mediator	Dependent variable
1	Actual weight	Victimization	Trait self-esteem
2	Actual weight	Victimization	State self-esteem
3	Actual weight	Discrimination	Trait self-esteem
4	Actual weight	Discrimination	State self-esteem

Table 7

Meditational Models between Perceived Weight and Weight Stigma

Model	Independent variable	Mediator	Dependent variable
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1	Perceived weight	Victimization	Trait self-esteem
2	Perceived weight	Victimization	State self-esteem
3	Perceived weight	Discrimination	Trait self-esteem
4	Perceived weight	Discrimination	State self-esteem

Secondary aims. *To what extent do measures of perceived control and social support moderate the relationship between weight stigma and psychosocial health and self-esteem?*

This analysis will assess the potential moderating effects of perceived control and social support by two methods (see Tables 8 and 9). The first method will examine if effect modification is present by “eyeballing” whether the estimates of effect differ across levels of the moderator, specifically above and below the median. The second method will use the best measure of all variables (as defined above) to assess if the interaction term (e.g. perceived control x weight stigma) is statistically significant. The results from the above defined 5 research questions will be used to identify the strongest direct and indirect effects which will then be formally tested in a confirmatory structural equation model.

Table 8

Moderation Models between Victimization and Control

Model	Independent variable	Moderator	Dependent variable
1	Victimization	Low control	PH and SSE
2	Victimization	High control	PH and SSE

3	Victimization	Low support	PH and SSE
4	Victimization	High support	PH and SSE

Table 9

Moderation Models between Discrimination and Control

Model	Independent variable	Moderator	Dependent variable
1	Discrimination	Low control	PH and SSE
2	Discrimination	High control	PH and SSE
3	Discrimination	Low support	PH and SSE
4	Discrimination	High support	PH and SSE

*Data Analysis Software*

Statistical Analysis Systems (SAS) version 9.2 was used for data analysis. All data was kept on a secured university server that recorded all responses after the survey was closed the results were downloaded to excel and then imported into SAS for analysis.

In Chapter 4, the results of the preliminary analysis and a brief description of the data analysis plan of the study hypotheses will be presented.

## CHAPTER FOUR

### Results

This chapter will present the results of the study starting with a brief description of the sample. Then the results of the preliminary analysis, results for each of the five research hypotheses and secondary analysis questions will be presented.

#### *Sample*

Based on the power analysis a sample of 716 subjects was determined to address the proposed hypothesis with 80% power. Of the population 1003 completed the online survey. Participants were excluded if 75% of the survey was not completed or 75% of each scale was not completed. Seventeen (1.7%) were excluded from analysis due to missing data. Another 31 were excluded because the respondent did not meet the study eligibility requirements resulting in 48 participants being excluded from analysis. Of the 31 surveys excluded 29(2%) of the sample were over 21 years of age. Of the excluded students 21(68%) were females, 26(84%) were Caucasian, 22 (71%) were seniors, 15 (48%) self-identified as normal weight and 12(39%) perceived themselves as overweight. Of those excluded note fourteen were normal weight; seven were overweight and obese, respectively according to computed BMI. The resulting sample consisted of 955 participants. BMI ranged from 15 to 65 in this sample.

The participants were recruited for this study from the USF Tampa campus of currently enrolled undergraduate students. Participants were recruited via email from the

undergraduate listserv provided upon request from the registrar’s office after IRB approval was obtained. All participants completed an online survey after consenting to participate. As described in Chapter 3, the first part of the survey consisted of demographic information including age, gender, class ranking, and race. This information was followed by height, weight, perceived weight, and perceived control. The remainder of the survey was composed of the Multidimensional Scale of Perceived Social Support (MSPSS), Rosenberg Self-esteem Scale (SSE), Life Experiences Scale (LES), Perception of Teasing Scale (POTS), Gatehouse Bullying Scale (GBS), State Self-esteem Scale (SSES), Contour Drawing Rating Scale (CDRS) and the Physician Health Questionnaire 9 (PHQ-9).

Data collection was conducted from October 10, 2008, through January 8, 2009. One email invitation to participate and one reminder was sent out to all potential participants. A description of the sample is presented in Table 10.

*Preliminary Analysis*

Table 10

Sample Demographics

	<b>N</b>	<b>f (P)</b>	<b>M</b>	<b>SD</b>
Age	955		19.67	1.04
18		150(16%)		
19		272(28%)		

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20		273(29%)
21		260(27%)
Gender	955	
Female		787(82%)
Male		168(18%)
Race/Ethnicity	940	
African American		59(6%)
Asian		26(3%)
Caucasian		710(76%)
Hispanic		99(11%)
Native American		5(0.5%)
Pacific Islander		4(0.4%)
Other		40(4%)
Class	955	
Freshman		154(16%)
Sophomore		290(30%)

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Junior	302(32%)
Senior	209(22%)

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Of the participants who responded to the survey, the majority of them self-selected being normal weight, which was consistent with their computed body mass index of the participants based on their self-reported height and weight. The sample description by weight is presented in Table 11.

Table 11  
Weight Descriptives for College Students

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<b>Weight Status</b>	<b>f(P)</b>	<b>M</b>	<b>SD</b>	<b>Mode</b>
	Body Mass Index	24.35	5.77	20.64
Underweight	80(8%)			
Normal Weight	546(57%)			
Overweight	187(20%)			
Obese	139(15%)			
	Perceived Weight	2.28	0.65	2.00
Underweight	61(6%)			
Normal Weight	611(64%)			

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Overweight	235(25%)
Obese	46(5%)

Note. BMI categories are based on CDC categories of underweight >15 and <18.5, normal weight 18.5 and <24.9, overweight >24.9 and <29.9 and obese >29.9.

It is interesting to note that participants' perception of their weight slightly differed from their calculated body mass index by the compared percentages for each category with these differences ranging from 2 to 10%. This may be a result of individuals believing they are either heavier or lighter than they actually are. The descriptive statistics for all variables are presented in Table 12.

Table 12

Descriptive Statistics of all Variables

<b>Variables</b>	<b>N<sup>a</sup></b>	<b>M</b>	<b>SD</b>	<b>Mode</b>
Outcome Variables				
PHQ-9	955	7.07	5.81	2.00
CDRS	951	1.27	1.41	1.00
Predictor Variables				
BMI	952	24.35	5.77	20.64
P. Weight	953	2.28	0.65	2.00
LES	955	19.57	4.96	20.00
POTS	955	9.38	5.07	6.00



GBS	955	0.40	0.88	0.00
Mediators				
SES	955	20.25	5.72	20.00
SSES	926	58.11	11.92	62.00
Moderators				
MSPSS	955	5.52	1.21	7.00
P. Control	955	5.95	2.29	8.00

Note. Table abbreviations are Physician Health Questionnaire-9 (PHQ-9), Contour Drawing Rating Scale (CDRS), Body Mass Index (BMI), Perceived Weight (P. Weight), Life Experiences Scale (LES), Perception of Teasing Scale (POTS), Gatehouse Bullying Scale (GBS), Rosenberg Self-esteem Scale (SES), State Self-esteem Scale (SSES), Multidimensional Scale of Perceived Social Support (MSPSS) and Perceived Control (P. Control). <sup>a</sup>n = the number of participants who answered the question and used for analysis.

Overall, the sample had mild depressive symptoms based on mean PHQ-9 score between five and nine. Additionally some were was mildly dissatisfied with their bodies based on the mean CDRS score. Furthermore, it should be noted most of the sample were normal weight due to a BMI score falling in the range of 18.5 to 24.9 according the CDC. Although, a predominantly normal weight sample they experienced some discrimination due to a myriad of reasons such age, gender, and race. However, few were teased or bullied about their weight. Overall, they had a good level of self-worth, social support and control over their weight. The prevalence of weight stigma is presented in Tables 13-15. Frequency and prevalence was calculated for all respondents who did not answer never or no to the survey questions in the tables to follow. For the

Life Experiences Scale the scores were reverse scored with lower scores indicating more discrimination experienced.

Table 13

Prevalence of Discrimination among College Students

<b>Discrimination Question</b>	<b>f (P)</b>	<b>Prevalence</b>
You were treated with less courtesy than other people.	930(97.4%)	92.7
You were treated with less respect than other people.	924(97%)	92.1
You receive poor service than other people at restaurants or stores.	937(98.3%)	93.4
People act as if they think you are not smart.	897(93.9%)	89.4
People act as if they are afraid of you.	923(96.8%)	92.0
People act as if they think you are dishonest.	938(98.3%)	93.5
People act as if they are better than you are.	864(90.7%)	86.1
You or your family members are called names or insulted.	938(98.2%)	93.5
You are threatened or harassed.	945(99.2%)	94.2
People ignore you or act as if you are not there.	904(95%)	90.1

Note. Prevalence rate is per 100.

Approximately 96% of participants felt they were discriminated for some reason. Participants most frequently reported being threatened or harassed, were called names or

insulted, treated as dishonest, received poorer service in restaurants or stores (see Table 13). When the reason for such discriminatory experiences were elicited the majority indicated being their age and gender. Of note 21% of participants attributed discrimination due to being overweight while another 7% felt it was due to being underweight.

Table 14

Prevalence of Teasing among College Students

<b>Teasing Question</b>	<b>f (P)</b>	<b>Prevalence</b>
People made fun of you because you were heavy.	463(48.6%)	46.1
People made jokes about you being too heavy.	406(42.6%)	40.4
People laughed at you for trying out for sports because you were heavy.	215(22.5%)	21.4
People called you names like “fatso”.	256(26.8%)	25.5
People pointed at you because you were overweight.	172(18.2%)	17.1
People snickered about your heaviness when you walked into a room alone.	163(17.2%)	16.3

Note. Prevalence rate is per 100.

About 29% of individuals reported being teased due to their weight. Of those who were teased majority were made fun of for being heavy or had jokes made about them for being heavy. While another 26% of the participants were called names like “fatso” (See Table 14).

Table 15

## Prevalence of Bullying among College Students

<b>Bullying Question</b>	<b>f (P)</b>	<b>Prevalence</b>
Has anyone teased or called you names because of your weight recently.	185(19.4%)	1.84
Has anyone spread rumors about you because of your weight recently.	49(5.1%)	4.88
Have you been deliberately left out of things because of your weight recently.	61(6.4%)	6.08
Have you been threatened physically or actually hurt because of your weight by another student recently <sup>a</sup> .	5(0.5%)	4.99

Note. Prevalence rate is per 100. <sup>a</sup>prevalence rate is per 1000.

Majority of the participants did not experience bullying due to weight of those who experienced bullying (8%) most were teased or called names because of their weight followed by been deliberately left out of things because of their weight. Of note, very few participants were physically hurt or threatened due to their weight (see Table 15).

In summary, discrimination and teasing were the most frequent stigmatizing experiences by college students. Although most of the participants indicated they were discriminated against only about 21% indicated they were discriminated due to being overweight while 7% indicated the reason being underweight. Bullying was rarely experienced in this population but those who were bullied mostly were teased or called names.

To address the first aim of this investigation correlations among the variables were computed and are presented in Table 16. The majority of the variables were negative and weakly associated with one another meaning the variables were measuring different concepts and inversely related so as one increases the other decreases and vice versa. Trait and state self-esteem were moderately negatively correlated with body dissatisfaction and strongly negatively correlated with depressive symptoms. As self-esteem increased, symptoms of depression and body dissatisfaction decreased and vice versa indicating that the more self-esteem an individual has they experience less depressive symptoms and body dissatisfaction. Stated differently the more depressive symptoms or body dissatisfaction an individual has the lower their self-esteem.

Table 16

Correlations between Scales for College Students

<b>Variables</b>	<b>BMI</b>	<b>PWT</b>	<b>PCON</b>	<b>MSPSS</b>	<b>SES</b>	<b>LES</b>	<b>POTS</b>	<b>GBS</b>	<b>SSES</b>	<b>CDRS</b>	<b>PHQ9</b>
<b>BMI</b>	1.00										
<b>PWT</b>	.762**	1.00									
<b>PCON</b>	-.097**	-.047	1.00								
<b>MSPSS</b>	-.105**	-.089**	.117**	1.00							
<b>SES</b>	-.157**	-.191**	.250**	.363**	1.00						
<b>LES</b>	.119**	.089**	-.148**	-.307**	-.424**	1.00					
<b>POTS</b>	.534**	.468**	-.063**	-.155*	-.306**	.331**	1.00				
<b>GBS</b>	.124**	.081*	-.118**	-.196**	-.234**	.340**	.238**	1.00			
<b>SSES</b>	-.261**	-.282**	.275**	.338**	.811**	-.430**	-.371**	-.273**	1.00		
<b>CDRS</b>	.523**	.585**	-.064**	-.154*	-.405**	.135**	.424**	.137**	-.490**	1.00	
<b>PHQ9</b>	.203**	.205**	-.189**	-.372**	-.641**	.429**	.346**	.275**	-.709**	.372**	1.00

Note: Table abbreviations are Body Mass Index (BMI), Perceived Weight (PWT), Perceived Control (PCON), Multidimensional Scale of Perceived Social Support (MSPSS), Rosenberg Self-esteem Scale (SES), Life Experiences Scale (LES), Perception of Teasing Scale (POTS), Gatehouse Bullying Scale (GBS), State Self-esteem Scale (SSES), Contour Drawing Rating Scale (CDRS) and Physician Health Questionnaire-9 (PHQ9). \*  $p < .05$ . \*\*  $p < .01$ .

The data were checked for the presence of covariates among the variables. To check age as a covariate correlations were run. Since all the correlations were less than 0.1, age was thus ruled out as a possible covariate. In addition, regressions were run with and without age and it did not change the interpretation so in the interest of clarity, only the regressions without age are presented. An Analysis of Variance (ANOVA) was run to check gender and race as a potential covariate with the outcomes. Gender was found to be a significant predictor of body dissatisfaction and therefore it was included in all subsequent regressions predicting body dissatisfaction. Thus a limited gender analysis was evaluated for body dissatisfaction only with the following codes zero and one for females and males, respectively. Race was checked as a possible covariate by running a ANOVA with the outcomes. Race was ruled out due to a nonsignificant F test as a covariate which may be due to lack of racial/ethnic diversity in the sample. No additional analyses were performed to examine for potential covariates.

To address the second objective of this investigation a series of linear regression equations were performed to determine the best predictor of the outcomes of depressive symptoms and body dissatisfaction. See Tables 17-22.

Table 17

Summary of Linear Regression Analysis for Weight Status Variables Predicting

Depressive Symptoms (N = 947)

<b>Variable</b>	<b>B</b>	<b>SE B</b>	<b>β</b>
BMI	0.11	0.05	0.11*
Perceived Weight	1.02	0.43	0.12*

Note.  $R^2 = .04$ . \* $p < .05$  \*\* $p < .01$ .

Based on the model, body mass index and perceived weight were not good predictors of depressive symptoms ( $p > .01$ ) although the overall model was significant in predicting depressive symptoms better than chance. The variables did not explain a significant amount of variability in the model. The model only accounted for 4% of the variability in depressive symptoms.

Table 18

Summary of Linear Regression Analysis for Weight Status Variables Predicting Body

Dissatisfaction (N = 947)

<b>Variable</b>	<b>B</b>	<b>SE B</b>	<b>β</b>
Step 1			
BMI	0.04	0.01	.18**



Perceived Weight	0.97	0.09	.45**
Step 2			
BMI	0.06	0.01	.25**
Perceived Weight	0.81	0.09	.37**
Gender	-0.83	0.10	-.22**

Note.  $R^2 = .36$  for step 1.  $\Delta R^2 = .40$  for step 2. \* $p < .05$ . \*\* $p < .01$ .

The joint predictive power of BMI and perceived weight explained 36% of the variance in body dissatisfaction in the first model with the addition of gender in the second model the model was slightly improved. The overall models were significant indicating that body dissatisfaction can be predicted at a better rate than chance. A one unit increase in BMI would decrease body dissatisfaction while controlling for perceived weight. Similarly, a unit increase in perceived would increase body dissatisfaction while holding BMI constant. Both variables were significant predictors of body dissatisfaction with perceived weight being a better predictor. Gender was also a significant predictor of body dissatisfaction and males had less body dissatisfaction than females.

Perceived weight was selected as the best predictor of the weight status variables because it was a slightly better predictor of both depressive symptoms and body dissatisfaction as evidenced by the data. Furthermore, this is consistent with the literature (Miller & Downey, 1995).

Table 19

Summary of Linear Regression Analysis for Weight Stigma Variables Predicting

Depressive Symptoms (N = 951)

<b>Variables</b>	<b>B</b>	<b>SE B</b>	<b>β</b>
Discrimination	0.37	0.04	.32**
Teasing	0.24	0.03	.21**
Bullying	0.74	0.21	.11**

Note. R<sup>2</sup> .24. \*p < .05. \*\*p < .01.

Discrimination, teasing and bullying explain 24% of the variance in depressive symptoms leaving 76% of variance unexplained by the variables in the model.

Discrimination and teasing were slightly better predictors of depressive symptoms. A unit increase in discrimination and teasing would increase depressive symptoms with the overall model significant.

Table 20

Summary of Linear Regression Analysis for Weight Stigma Variables Predicting Body

Dissatisfaction (N = 951)

<b>Variable</b>	<b>B</b>	<b>SE B</b>	<b>β</b>
Step 1			

Discrimination	-0.01	0.01	-.02
Teasing	0.12	0.01	.42*
Bullying	0.07	0.05	.05
Step 2			
Discrimination	-0.00	0.01	-.00
Teasing	0.12	0.01	.43*
Bullying	0.06	0.05	.04
Gender	-1.01	0.10	-.27*

Note.  $R^2$  .18 for step 1.  $\Delta R^2$  .25 for step 2. \* $p < .05$ . \*\* $p < .01$ .

Discrimination, teasing and bullying explain 18% of the variance in body dissatisfaction in the first model and an additional seven percent of variance in the second model with 75% of the variance in body dissatisfaction unexplained. Teasing appears to be a better predictor in explaining the variance in body image due to the size of the regression coefficient than discrimination and bullying. A unit increase in teasing would increase body dissatisfaction.

Discrimination and teasing were both selected as best predictors because they are different concepts in the literature and they are not highly correlated as evidenced by a correlation of .33. In addition, discrimination was the best predictor of depressive symptoms. Even though bullying and teasing are also different, teasing was a significant

predictor of both outcomes as supported by the data therefore retained for subsequent analysis.

Table 21

Summary of Linear Regression Analysis for Self-esteem Variables Predicting Depressive Symptoms (N = 924)

<b>Variables</b>	<b>B</b>	<b>SE B</b>	<b>β</b>
Trait Self-esteem	-0.21	0.04	-.20**
State Self-esteem	-0.27	0.02	-.54**

Note.  $R^2$  .52. \* $p < .05$ . \*\* $p < .01$ .

Trait and state self-esteem account for 52% of the variation in depressive symptoms with less than 50% of the variance due to other influences not accounted for in the model. The overall model is significant indicating the model allows for predicting depressive symptoms at a rate better than chance. Both variables were significant predictors of depressive symptoms. Of the two variables of self-esteem, state self-esteem appears to be a stronger predictor based on the size of the beta in Table 21. A unit increase in state self-esteem or trait self-esteem would decrease depressive symptoms.

Table 22

## Summary of Linear Regression Analysis for Self-esteem Variables Predicting Body

Dissatisfaction (N = 924)

<b>Variable</b>	<b>B</b>	<b>SE B</b>	<b><math>\beta</math></b>
Step 1			
Trait Self-esteem	-0.01	0.01	-.03
State Self-esteem	-0.06	0.01	-.47**
Step 2			
Trait Self-esteem	-0.01	0.01	-.03
State Self-esteem	-0.05	0.01	-.46**
Gender	-0.86	0.10	-.23**

Note.  $R^2$  .24 for step 1.  $\Delta R^2$  .29 for step 2. \* $p < .05$ . \*\* $p < .01$ .

The joint predictive power of trait and state self-esteem account for 24% of the variation in body dissatisfaction in the first model and 29% of the variation in the second model with the addition of gender. Yet over 70% of the variation in body dissatisfaction is unexplained by the second model although the overall model is significant. In addition, state self-esteem is a stronger predictor of body dissatisfaction. A unit increase in state self-esteem would decrease body dissatisfaction. Trait self-esteem was not a significant

predictor of body dissatisfaction. Consistent with the literature males had less body dissatisfaction than their female counterparts.

State self-esteem was selected as the best predictor for self-esteem since it is situationally-constructed and can detect acute changes in self-esteem like recalling stigmatizing experiences whereas trait self-esteem evaluates generally how well the individual perceives themselves. Furthermore, state self-esteem was selected because it was a significant predictor for both outcomes as supported by the data.

In summary, the best predictor of depressive symptoms and body dissatisfaction was selected by performing a series of linear regressions for each domain using SAS. The predictors that were selected accounted for the most variability evidenced by a larger beta coefficient and significant in addition to logic and they were the following: perceived weight for weight status, discrimination and teasing for weight stigma and state self-esteem for self-esteem.

*Hypothesis 1: Weight-related variables will be positively related to depressive symptoms*

To test this first hypothesis correlations were run see Table 23. Pearson correlations show the strength and the magnitude of the relationship between two variables. Teasing and discrimination were modestly correlated with depressive symptoms whereas the other variables were weakly correlated. Overall as depressive symptoms increase so did BMI, perceived weight, discrimination, bullying and teasing. Stated differently the heavier an individual and the more stigmatizing experiences the greater the depressive symptoms. This hypothesis was supported.

Table 23

Correlations between Depressive symptoms and Weight-related variables

<b>Variables</b>	<b>Depressive Symptoms</b>
Body Mass Index	.20**
Perceived Weight	.21**
Discrimination	.43**
Bullying	.28**
Teasing	.35**

Note. \*p < .05. \*\*p < .01.

*Hypothesis 2: Weight-related variables are negatively associated with body satisfaction*

To test this hypothesis correlations were also run as in research question one see Table 24. Weight was strongly correlated with body dissatisfaction, teasing moderately correlated and bullying and teasing weakly related to body dissatisfaction. All correlations were positive. The data did support this hypothesis. Largely as body dissatisfaction increase so did BMI, perceived weight, discrimination, bullying and teasing. Greater body dissatisfaction is associated with higher levels of weight and teasing more so than other stigmatizing experiences such as bullying and discrimination in this case.

Table 24

Correlations between Body Dissatisfaction and Weight-related variables

<b>Variables</b>	<b>Body Dissatisfaction</b>
Body Mass Index	.52**
Perceived Weight	.59**

Discrimination	.14**
Bullying	.14**
Teasing	.42**

Note. \*p < .05. \*\*p < .01.

In sum, hypotheses one and two were correlational in nature. Pearson correlations were run to determine the association between the predictors and the outcomes depressive symptoms and body dissatisfaction, respectively. Most of the correlations were modest in nature. However, the correlations were positive in nature indicating that more depressive symptoms and body dissatisfaction was experienced with increased stigmatizing experiences and at heavier weights and vice versa depressive symptoms and body dissatisfaction were less at lower weights and with infrequent stigmatizing experiences.

Hypotheses three through five are mediational hypotheses, which took the form in Figure 2. In order to be concise the mediated relationships are presented in one model each path specifying a different analysis. The relationships were analyzed using the Baron and Kenny approach (1986) in SAS. According to the Baron and Kenny approach, first the mediator is regressed on the predictor. Second, the outcome is regressed on the predictor. Third, the outcome is regressed on the predictor and mediator simultaneously.



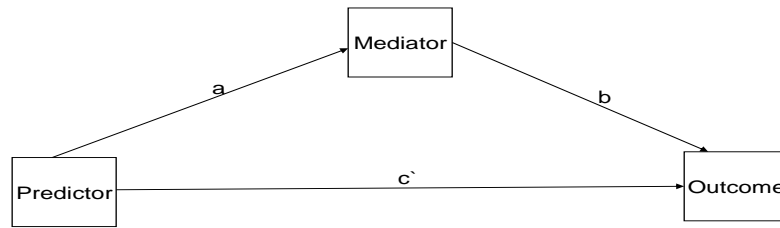


Figure 2. Mediator Model illustrating the relationship between variables and analysis strategy.

*Hypothesis 3: Measures of self-esteem will mediate the relationship between weight related variables and depressive symptoms*

This hypothesis was tested using the Baron and Kenny method (1986) in SAS to check for the presence of mediation by running a series of multiple regressions. Tables 25 and 26 present the results of the analyses and Figures 3-6 show the variables analyzed. Table 25

Summary of Multiple Regression Analysis for Perceived Weight and Self-esteem Variables Predicting Depressive Symptoms (N = 923)

Variable	B	SE B	$\beta$
Step 1			
<u>DV</u>	<u>Predictors</u>		

Depression	PWT	1.804	0.283	.203**
Step 2				
<u>DV</u>	<u>Predictors</u>			
Trait SE	PWT	0.398	0.177	.045*
State SE	PWT	-2.471	0.350	-.135**
Step 3-4				
<u>DV</u>	<u>Predictors</u>			
Depression	PWT	0.087	0.214	.010
	Trait SE	-0.208	0.040	-.204**
	State SE	-0.265	0.020	-.540**

Note. Perceived Weight (PWT), Self-esteem (SE). \*p < .05. \*\*p < .01.

In step one perceived weight is a significant predictor of depressive symptoms with a unit increase in perceived weight depressive symptoms would increase. The model for step two was significant. State self-esteem was significant predictor of depressive symptoms ( $p < .01$ ) a unit increase in state self-esteem would decrease depressive symptoms. Approximately 65% of the variance in self-esteem was explained by perceived weight. The predictors in the last model best explain depressive symptoms. Based on the F test of 328.18 the model was a good model for predicting depressive symptoms in steps 3-4. Perceived weight did not reach significance in the last model

predicting depressive symptoms. As weight increased, state self-esteem decreased whereas a unit increase in state or trait self-esteem would decrease depressive symptoms.

Table 26

Summary of Multiple Regression Analysis for Weight Stigma and Self-esteem Variables Predicting Depressive Symptoms (N = 926)

Variable		B	SE B	$\beta$
Step 1				
<u>DV</u>	<u>Predictors</u>			
Depression	Bullying	1.815	0.206	.275**
	Teasing	0.399	0.035	.348**
	Discrimination	0.499	0.034	.427**
Step 2				
<u>DV</u>	<u>Predictors</u>			
Trait SE	Bullying	0.080	0.134	.012
	Teasing	0.018	0.024	.016
	Discrimination	-0.126	0.026	-.109**
State SE	Bullying	-0.755	0.270	-.056**

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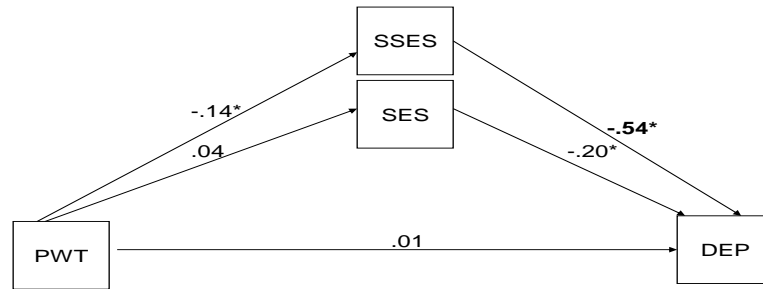
	Teasing	-0.266	0.048	-.114**
	Discrimination	-0.125	0.052	-.052*
Step 3-4				
<u>DV</u>	<u>Predictors</u>			
Depression	Bullying	0.336	0.160	.051*
	Teasing	0.077	0.028	.068**
	Discrimination	0.127	0.031	.109**
	Trait SE	-0.178	0.039	-.175**
	State SE	-0.236	0.019	-.482**

---

Note. Self-esteem (SE). \*p < .05. \*\*p < .01.

In the first model all predictors were significant in predicting depressive symptoms for a unit increase in discrimination, bullying and teasing would increase depressive symptoms. Model two explained 67% of the variance in both measures of self-esteem based on the weight stigma variables. Discrimination was the only significant predictor of trait self-esteem indicating that trait self-esteem would decrease with a unit increase in discrimination. All predictors except discrimination were significant in predicting state self-esteem indicating for a unit increase in either bullying or teasing would decrease state self-esteem in step two+. The predictors in the last model best explain depressive symptoms. Based on the F test of 215.09 the model was a good model

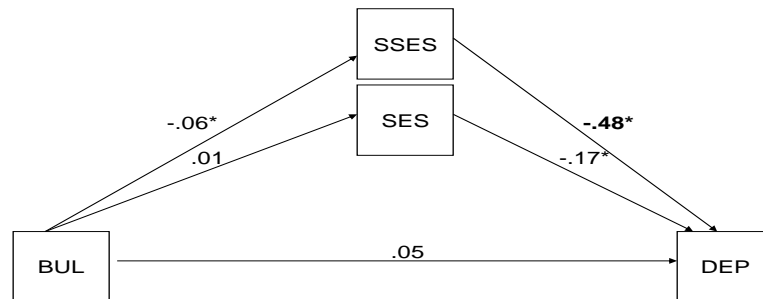
in predicting depressive symptoms accounting for 54% of the variance. Bullying was marginally significant in predicting depressive symptoms in model three. For a unit increase in state or trait self-esteem would decrease depressive symptoms whereas a unit increase in discrimination or teasing would increase depressive symptoms.



*Figure 3.* The mediated role of Self-esteem in the prediction of Depressive symptoms as a function of Perceived Weight.

All the paths were negative and significant  $p < .01$  except for the direct path of perceived weight to depressive symptoms and perceived weight to trait self-esteem ( $p < .05$ ). Sobel's test was  $-2.223$   $p = .026$  and  $6.258$   $p = .000$ , for trait and state self-esteem, respectively. Mediation was supported for state self-esteem indicating that a significant portion of the direct effect of perceived weight predicting depressive symptoms is due to state self-esteem. Since the direct path from perceived weight to depressive symptoms was not reduced to zero in the presence of state self-esteem thus resulting in partial mediation. Most of the effect of perceived weight on depressive symptoms was mediated by self-esteem. In the presence of perceived weight, low self-esteem is associated with

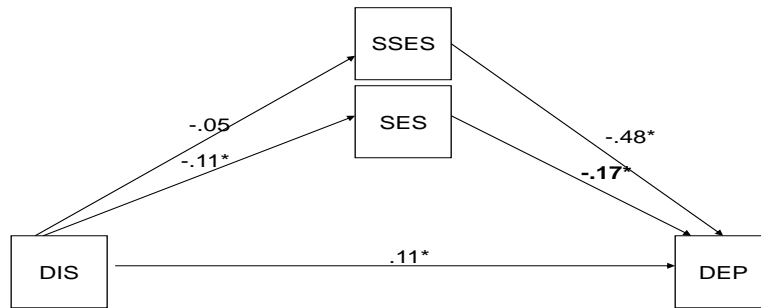
more depressive symptoms or vice versa as evident by the significant coefficient. As self-esteem increases, depressive symptoms decrease and vice versa. Mediation was not found for trait self-esteem.



*Figure 4.* Mediated role of Self-esteem in the prediction of Depressive symptoms as a function of Bullying.

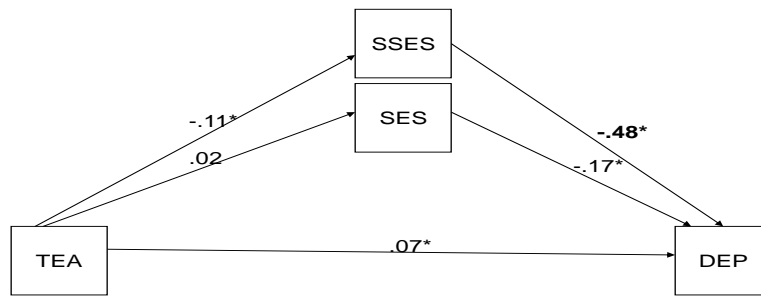
All paths were negative and significant  $p < .01$  except the direct path from bullying to depressive symptoms ( $p < .05$ ) and bullying to trait self-esteem while controlling for discrimination and teasing. Sobel's test was  $2.722$   $p = .006$  and  $-0.594$   $p = .552$ , for state and trait self-esteem, respectively. Mediation was not confirmed for trait (global) self-esteem. Although Sobel's test was significant for state self-esteem partial mediation was supported since the direct path from bullying to depressive symptoms was not reduced to zero indicating that state self-esteem accounts for some of the variation in depressive symptoms being predicted by bullying. Most of the effect of bullying on depressive symptoms was mediated by self-esteem. In the presence of bullying, low self-

esteem is associated with more depressive symptoms or vice versa as evident by the significant coefficient. As state self-esteem increases, depressive symptoms decrease and vice versa.



*Figure 5.* Mediated Role of Self-esteem in the prediction of Depressive Symptoms as a function of Discrimination.

All paths were negative and significant  $p < .01$  with the exception of the path from discrimination to depressive symptoms. Sobel's test was 2.334  $p = .020$  and 3.326  $p = .001$  for state and trait self-esteem, respectively. Partial mediation was supported for trait self-esteem indicating that trait self-esteem accounts for a significant amount of the effect of discrimination predicting depressive symptoms. In presence of discrimination, low self-esteem is associated with more depressive symptoms and vice versa as evident by the significant coefficient. As trait self-esteem increases, depressive symptoms decrease and vice versa.



*Figure 6.* Mediated Role of Self-esteem in the Prediction of Depressive Symptoms as a function of Teasing.

All paths were significant  $p < .01$  except the path from teasing to trait self-esteem with all paths negative except the path from teasing to trait self-esteem and teasing to depressive symptoms in the presence of bullying and discrimination. Sobel's test was  $-0.739$   $p = .460$  and  $5.081$   $p = .000$  for trait and state self-esteem, respectively. Partial mediation was supported for state self-esteem meaning that a significant portion of the effect of teasing on depressive symptoms is mediated by state self-esteem. State self-esteem had a strong effect on depressive symptoms. State self-esteem strongly mediated the relationship between teasing and depressive symptoms as state self-esteem increases the prevalence of depressive symptoms decrease.

In summary, self-esteem variables were found to partially mediate the relationship between weight stigma and depressive symptoms. Self-esteem strongly mediated the relationship between perceived weight and depressive symptoms as well as weight stigma and depressive symptoms. In the presence of either perceived weight or weight stigma



low self-esteem was associated with greater depressive symptoms and vice versa. State self-esteem appeared to influence the relationship between weight stigma and depressive symptoms more than trait self-esteem. In addition, state self-esteem mediated the relationship between perceived weight and depressive symptoms suggesting that the influence of how an individual perceives their weight developing depressive symptoms is a function of their acute (state) self-esteem.

*Hypothesis 4: Measures of self-esteem will mediate the relationship between weight-related variables and body image*

This hypothesis was tested using the Baron and Kenny method (1986) in SAS to check for the presence of mediation by running a series of multiple regressions. Tables 27 and 28 present the results of the analyses and Figures 7-10 show the variables analyzed.

Table 27

Summary of Multiple Regression Analysis for Perceived Weight and Self-esteem  
Variables Predicting Body Dissatisfaction (N = 923)

<b>Variable</b>	<b>B</b>	<b>SE B</b>	<b><math>\beta</math></b>	
Step 1				
<u>DV</u>	<u>Predictors</u>			
Body Dissatisfaction	PWT	1.234	0.056	.568**
	Gender	-0.709	0.096	-.191**

---

Step 2				
<u>DV</u>	<u>Predictors</u>			
Trait SE	PWT	0.391	0.178	.044*
	Gender	-0.130	0.290	-.008
State SE	PWT	-2.456	0.352	-.134**
	Gender	0.102	0.588	.003
Step 3-4				
<u>DV</u>	<u>Predictors</u>			
Body Dissatisfaction	PWT	1.024	0.054	.470**
	Gender	-0.715	0.087	-.193**
	Trait SE	-0.022	0.010	-.088*
	State SE	-0.034	0.005	-.283**

---

Note. Perceived Weight (PWT), Self-esteem (SE). \*p < .05. \*\*p < .01.

In step 2 approximately 66% of the variance in self-esteem is explained by the predictors in the model. The predictors in the model best explain body dissatisfaction based on the F test of 223.85 the model was a good model in predicting body dissatisfaction for steps 3-4 accounting for 49% of the variance. As self-esteem increased, body dissatisfaction decreased with females experiencing more dissatisfaction than males and those at higher perceived weight levels having more dissatisfaction.

Table 28

## Summary of Multiple Regression Analysis for Weight Stigma and Self-esteem Variables

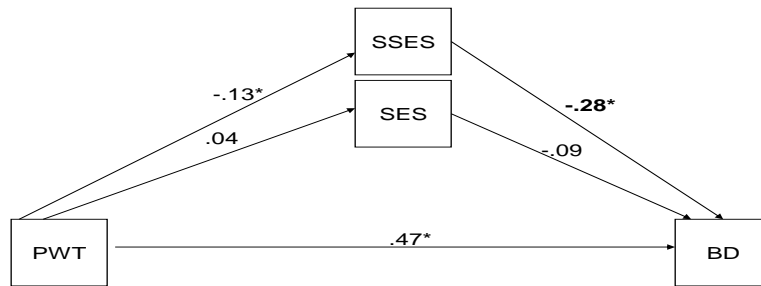
Predicting Body Dissatisfaction (N = 955)

Variable		B	SE B	$\beta$
Step 1				
<u>DV</u>	<u>Predictors</u>			
Body Dissatisfaction	Bullying	0.223	0.050	.138**
	Teasing	0.124	0.008	.442**
	Discrimination	0.044	0.009	.155*
	Gender	-1.004	0.105	-.269*
Step 2				
<u>DV</u>	<u>Predictors</u>			
Trait SE	Bullying	0.080	0.134	.012
	Teasing	0.018	0.024	.016
	Discrimination	-0.125	0.026	-.109**
	Gender	-0.059	0.288	-.004
State SE	Bullying	-0.743	0.271	-.055**

	Teasing	-0.270	0.048	-.116**
	Discrimination	-0.130	0.053	-.054*
	Gender	0.857	0.584	.028
Step 3-4				
<u>DV</u>	<u>Predictors</u>			
Body Dissatisfaction	Bullying	-0.011	0.045	-.007
	Teasing	0.092	0.008	.332**
	Discrimination	-0.041	0.009	-.143**
	Trait SE	-0.016	0.011	.065
	State SE	-0.045	0.005	-.373**
	Gender	-0.907	0.097	-.245**

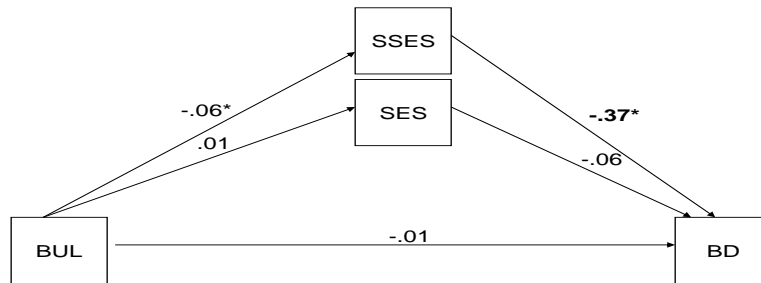
Note. Self-esteem (SE). \*p < .05. \*\*p < .01.

The predictors in the model best explain body dissatisfaction based on the F test of 96.86 the model was a good model in predicting body dissatisfaction for steps 3-4 accounting for 39% of the variance. Step 2 explained approximately 67% of the variance in self-esteem based on the predictors in the model. Overall, males experienced less dissatisfaction than females. As state self-esteem and discrimination increased body dissatisfaction decreased whereas as teasing increased so did body dissatisfaction.



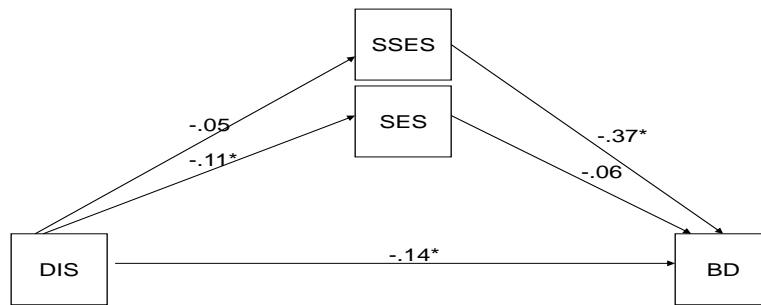
*Figure 7.* Mediated Role of Self-esteem in the Prediction of Body Dissatisfaction as a function of Perceived Weight.

All the paths were significant  $p < .01$  except for the paths from perceived weight to trait self-esteem ( $p < .05$ ) and trait self-esteem to body dissatisfaction ( $p < .05$ ). Sobel's test was  $-1.555$   $p = .120$  and  $4.895$   $p = .000$ , for trait and state self-esteem, respectively controlling for gender. Partial mediation was supported for state self-esteem indicating that a significant portion of the influence of perceived weight on body dissatisfaction is associated with state self-esteem. There is a strong relationship of weight in body dissatisfaction however state self-esteem explains some of that relationship as state self-esteem increase body dissatisfaction decreases and vice versa.



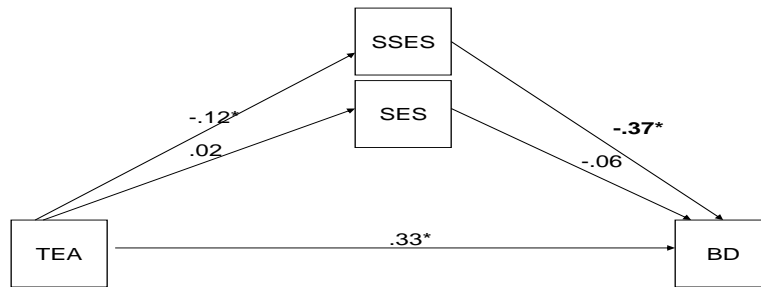
*Figure 8.* Mediated Role of Self-esteem in the prediction of Body Dissatisfaction as a function of Bullying.

The only significant paths  $p < .01$  were the path from bullying to state self-esteem and state self-esteem to body dissatisfaction while controlling for discrimination, teasing and gender. Sobel's test was  $2.605$   $p = .009$  and  $-0.552$   $p = .581$ , for state and trait self-esteem, respectively. Partial mediation was confirmed for state self-esteem demonstrating that a significant portion of the influence of bullying on body dissatisfaction is associated with state self-esteem. Most of the effect of bullying on body dissatisfaction was mediated by state self-esteem.



*Figure 9.* Mediated Role of Self-esteem in the Prediction of Body Dissatisfaction as a function Discrimination.

All paths were significant  $p < .01$  except the path from discrimination to state self-esteem and trait self-esteem to body dissatisfaction with all negative in the presence of bullying, teasing and gender. Sobel's test was  $2.366 p = .018$  and  $1.393 p = .164$  for state and trait self-esteem, respectively. Mediation was not supported for either state or trait self-esteem signifying that the influence of discrimination on body dissatisfaction is not due to self-esteem.



*Figure 10.* Mediated Role of Self-esteem in the Prediction of Body Dissatisfaction as a function of Teasing.

All paths are significant  $p < .01$  except the path from teasing to trait self-esteem and the path from trait self-esteem to body dissatisfaction in the presence of bullying, discrimination and gender. All paths were negative except the path from teasing trait self-esteem. Sobel's test was  $-0.680$   $p = .497$  and  $4.660$   $p = .000$  for trait and state self-esteem, respectively. Partial mediation was supported for state self-esteem demonstrating that a significant portion of the influence of teasing on body dissatisfaction was associated with state self-esteem. The direct effect between teasing and body dissatisfaction as well as the indirect effect of state self-esteem on body dissatisfaction in the presence of teasing were fairly strong.

In summary, state self-esteem was established as partially mediating the relationship between perceived weight and body dissatisfaction suggesting that the acute self-esteem of the individual may determine whether or not how the individual perceives their weight and experience body dissatisfaction. Additionally, state self-esteem was



found to partially mediate the relationship between teasing and body dissatisfaction as well as bullying and body dissatisfaction. Self-esteem strongly mediated the relationship between perceived weight and body dissatisfaction as well as weight stigma and body dissatisfaction. In the presence of either perceived weight or weight stigma low self-esteem was associated with greater body dissatisfaction and vice versa. State self-esteem appeared to influence the relationship between weight stigma and body dissatisfaction more than trait self-esteem. Mediation was not established for self-esteem in the relationship between discrimination and body dissatisfaction.

Overall, there was a stronger indirect effect for depressive symptoms and stronger direct effect for body dissatisfaction in the mediational analyses conducted for hypotheses three and four as evidenced by the coefficient size on the direct and indirect paths to the outcomes.

*Hypothesis 5: Measures of weight stigma will show evidence of mediation between weight status and self-esteem*

This hypothesis was tested using the Baron and Kenny method (1986) in SAS to check for the presence of mediation by running a series of multiple regressions. Tables 29 and 30 present the results of the analyses and Figures 11-12 show the variables analyzed.

Table 29

Summary of Multiple Regression Analysis for Perceived Weight and Weight Stigma

Variables Predicting State Self-esteem (N = 925)

<b>Variable</b>	<b>B</b>	<b>SE B</b>	<b>β</b>

---

Step 1				
<u>DV</u>	<u>Predictors</u>			
State SE	PWT	-5.151	0.577	-.282**
Step 2				
<u>DV</u>	<u>Predictors</u>			
Bullying	PWT	-0.014	0.047	-.011
Teasing	PWT	3.356	0.214	.430**
Discrimination	PWT	-0.542	0.257	-.071*
Step 3-4				
<u>DV</u>	<u>Predictors</u>			
State SE	PWT	-3.113	0.581	-.170**
	Bullying	-1.506	0.406	-.112**
	Teasing	-0.360	0.079	-.154**
	Discrimination	-0.769	0.074	-.323**

---

Note. Perceived Weight (PWT), Self-esteem (SE). \*p < .05. \*\*p < .01.

The predictors in the model best explain state self-esteem. Based on the F test of 86.84 the model was a good model in predicting state self-esteem for steps 3-4 accounting for 27% of the variance. Step 2 explained approximately 21% of the variance

in weight stigma on average based on the predictors in the model. In general, the heavier the person and the more stigmatizing experiences the lower the state self-esteem.

Table 30

Summary of Multiple Regression Analysis for Perceived Weight and Weight Stigma

Variables Predicting Trait Self-esteem (N = 955)

<b>Variable</b>		<b>B</b>	<b>SE B</b>	<b>β</b>
Step 1				
<u>DV</u>	<u>Predictors</u>			
Trait SE	PWT	-1.669	0.280	-.190**
Step 2				
<u>DV</u>	<u>Predictors</u>			
Bullying	PWT	-0.018	0.046	-.013
Teasing	PWT	3.378	0.209	.436**
Discrimination	PWT	-0.576	0.252	-.076*
Step 3-4				
<u>DV</u>	<u>Predictors</u>			
Trait SE	PWT	-0.848	0.285	-.097**

Bullying	-0.505	0.201	-.078*
Teasing	-0.138	0.039	-.122**
Discrimination	-0.405	0.037	-.351**

Note. Perceived Weight (PWT), Self-esteem (SE). \*p < .05. \*\*p < .01.

The predictors in the model best explain trait self-esteem. Based on the F test of 68.19 the model was a good model in predicting trait self-esteem for steps 3-4 accounting for 22% of the variance. Step 2 explained approximately 21% of the variance in weight stigma on average based on the predictors in the model. Generally, the more stigmatizing experiences at greater weights the lower the trait self-esteem.

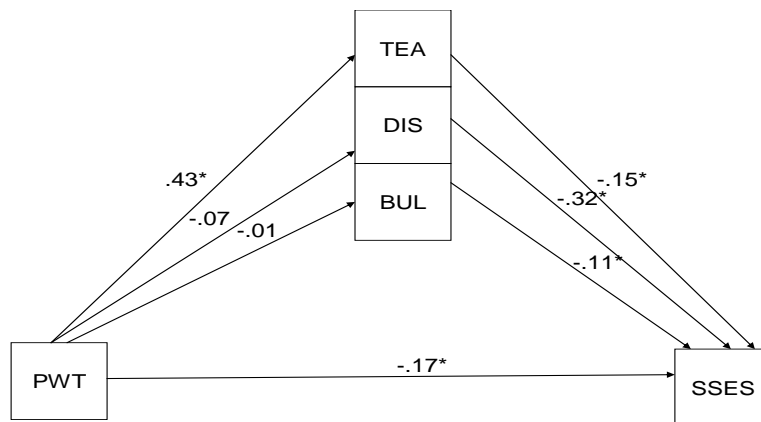


Figure 11. Mediated Role of Weight Stigma in the Prediction of State Self-esteem as a function of Perceived Weight.

All paths were significant  $p < .01$  except the paths from perceived weight to discrimination ( $p < .05$ ) and bullying. Sobel's test was  $0.304 p = .761$ ,  $2.071 p = .038$  and  $-4.351 p = .000$  for bullying, discrimination and teasing, respectively. All mediators were entered in each model to control for their influence on state self-esteem. Partial mediation was supported for teasing signifying that a portion of the influence of perceived weight on state self-esteem is mediated by teasing. There is a small direct and indirect effect of perceived weight on state self-esteem. Although there is a strong direct relationship between teasing and weight as teasing increased self-esteem decreased and vice versa.

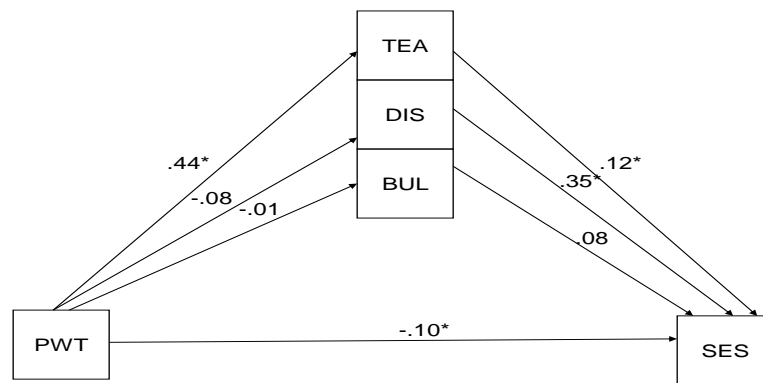


Figure 12. Mediated Role of Weight Stigma predicting Trait Self-esteem as a function of Perceived Weight.

All paths were significant  $p < .01$  except the paths from perceived weight to discrimination ( $p < .05$ ) and bullying and the path from bullying to trait self-esteem ( $p < .05$ ). Three paths were negative: perceived weight to bullying, discrimination and trait self-esteem. All mediators were entered in each model to control for their influence on trait self-esteem. Results of Sobel's test were  $0.385 p = .700$ ,  $2.241 p = .025$ , and  $-3.443 p$

= .001 for bullying, discrimination and teasing, respectively. Partial mediation was supported for teasing demonstrating that a portion of the influence of perceived weight on trait self-esteem was mediated by teasing. There is a small direct and indirect effect of perceived weight on state self-esteem. Although there is a strong direct relationship between teasing and weight as teasing increased self-esteem decreased and vice versa.

In summary, teasing was found to partially mediate the relationship between perceived weight and trait and state self-esteem. In other words, the influence of perceived weight on trait and state self-esteem was influenced by the individual's experience of teasing. Discrimination and bullying did not mediate the relationship between perceived weight and trait and state self-esteem.

Weight stigma was evaluated to check for the presence of mediation between perceived weight and depressive symptoms and body dissatisfaction. A series of multiple regressions using the Baron and Kenny (1986) approach was run in SAS. The results of these analyses are presented in Tables 31 and 32 and the relationships are depicted in Figures 13 and 14.

Table 31

Summary of Multiple Regression Analysis for Perceived Weight and Weight Stigma

Variables Predicting Depressive Symptoms (N = 953)

Variable	B	SE B	$\beta$
Step 1			
<u>DV</u>	<u>Predictors</u>		

Depression	PWT	1.804	0.283	.203**
Step 2				
<u>DV</u>	<u>Predictors</u>			
Bullying	PWT	-0.018	0.046	-.013
Teasing	PWT	3.378	0.209	.436**
Discrimination	PWT	-0.576	0.252	-.076*
Step 3-4				
<u>DV</u>	<u>Predictors</u>			
Depression	PWT	0.779	0.284	.088**
	Bullying	0.784	0.199	.119**
	Teasing	0.195	0.039	.170**
	Discrimination	0.378	0.037	.323**

Note. Perceived Weight (PWT). \*p < .05. \*\* p < .01.

The predictors in the model best explain depressive symptoms. Based on the F test of 78.26 the model was a good model in predicting depressive symptoms for steps 3-4 accounting for 25% of the variance. Step 2 explained approximately 21% of the variance in weight stigma on average based on the predictors in the model. Generally, the heavier the individual and the more stigmatizing experiences the greater the depressive symptoms.

Table 32

## Summary of Multiple Regression Analysis for Perceived Weight and Weight Stigma

Variables Predicting Body Dissatisfaction (N = 950)

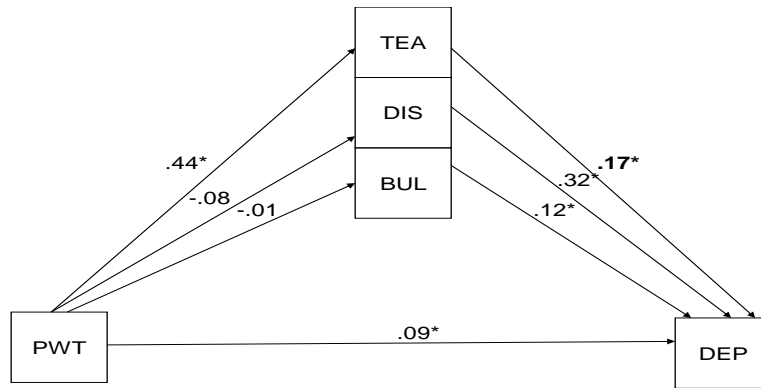
Variable		B	SE B	$\beta$
Step 1				
<u>DV</u>	<u>Predictors</u>			
Body Dissatisfaction	PWT	1.233	0.056	.568**
	Gender	-0.709	0.096	-.191**
Step 2				
<u>DV</u>	<u>Predictors</u>			
Bullying	PWT	-0.025	0.047	-.019
	Gender	-0.073	0.071	-.0315
Teasing	PWT	3.451	0.209	.445**
	Gender	1.170	0.358	.088
Discrimination	PWT	-0.534	0.255	-.070*
	Gender	0.667	0.386	.051
Step 3-4				



<u>DV</u>	<u>Predictors</u>			
Body Dissatisfaction	PWT	1.014	0.062	.467**
	Bullying	0.071	0.043	.044
	Teasing	0.056	0.008	.198**
	Discrimination	0.008	0.008	.029
	Gender	-0.803	0.093	-.216**

Note. Perceived Weight (PWT). \*p < .05. \*\*p < .01.

The predictors in the model best explain body dissatisfaction. Based on the F test of 136.86 the model was a good model in predicting body dissatisfaction for steps 3-4 accounting for 42% of the variance. Step 2 explained approximately 21% of the variance in weight stigma on average based on the predictors in the model. Overall, females experienced more dissatisfaction at increasing weights than males and the more teasing experienced.



*Figure 13.* Mediated Role of Weight Stigma Predicting Depressive Symptoms as a function of Perceived Weight.

All paths were significant  $p < .01$  except the paths from perceived weight to discrimination ( $p < .05$ ) and bullying. Results of Sobel's test were  $-0.388$   $p = .698$ ,  $-2.235$   $p = .025$  and  $4.755$   $p = .000$  for bullying, discrimination and teasing, respectively. All mediators were entered in each model to control for their influence on depressive symptoms. Partial mediation was supported for teasing signifying that a significant portion of the influence of perceived weight on depressive symptoms was mediated by teasing. There is a small direct and indirect effect of perceived weight on depressive symptoms. Although there is a strong direct relationship between teasing and weight as teasing increased depressive symptoms increased and vice versa.

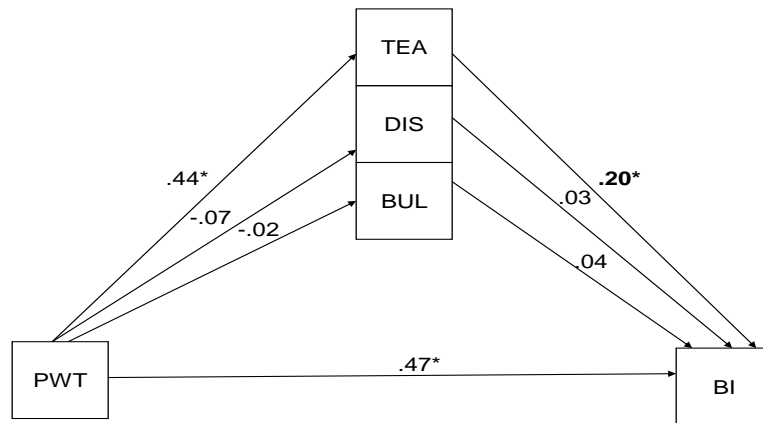


Figure 14. Mediated Role of Weight Stigma in the Prediction of Body Dissatisfaction as a function of Perceived Weight.

The only significant paths  $p < .01$  were perceived weight to teasing, teasing to body dissatisfaction and the direct path from perceived weight to body dissatisfaction. The path from perceived weight to discrimination was not significant ( $p < .05$ ). The following paths were negative perceived weight to bullying and discrimination. Results of Sobel's test were  $-0.513$   $p = .608$ ,  $-0.948$   $p = .343$  and  $6.106$   $p = .000$  for bullying, discrimination and teasing, respectively. All mediators were entered in each model to control for their influence on depressive symptoms. Mediation was supported for teasing signifying that a portion of the influence of perceived weight on body dissatisfaction was mediated by teasing. There was a strong direct and small indirect effect of perceived weight on body dissatisfaction. Although there is a strong direct relationship between teasing and weight as teasing increased body dissatisfaction increased and vice versa.

In summary, teasing was found to partially mediate the relationship between perceived weight and depressive symptoms and body dissatisfaction. In other words, the influence of perceived weight on body dissatisfaction and depressive symptoms was influenced by the individual's experience of teasing. Discrimination and bullying did not mediate the relationship between perceived weight and depressive symptoms and body dissatisfaction.

In sum, hypotheses three through five were meditational. These hypotheses were analyzed by running a series of multiple regressions following the Baron and Kenny approach (1986) using SAS. Partial mediation was supported for 11 relationships: perceived weight, teasing and depressive symptoms and body dissatisfaction; perceived weight, teasing and state and trait self-esteem; teasing, state self-esteem and body dissatisfaction and depressive symptoms; discrimination, trait self-esteem and depressive symptoms; bullying, state self-esteem and depressive symptoms and body dissatisfaction and perceived weight, state self-esteem and depressive symptoms and body dissatisfaction ( $p < .01$ ). Thus indicating that part of the influence of the independent variable on the dependent variable is mediate by a third variable. Stated differently a mediator mediates a significant portion of the influence of the predictor on the outcome.

### *Secondary Aims*

The secondary aims “were to examine the moderating effects of perceived control over weight and perceived social support on weight stigma.” These questions were analyzed by running general linear models using SAS to confirm the presence of

significant interaction ( $p < .01$ ). The significant interactions are presented in graph form. See Figures 15-19.

Moderation was not supported for control, bullying, discrimination and teasing predicting depressive symptoms. Moderation was also not supported for control, bullying, discrimination and teasing predicting body dissatisfaction. Stated differently regardless of the level of control an individual perceives they have over their weight high or low control was not associated with greater depressive symptoms or body dissatisfaction in the presence of weight stigma.

Moderation was not supported for social support, bullying and teasing predicting body dissatisfaction. Moderation was also not supported for social support and bullying predicting depressive symptoms. Stated differently regardless of the level of social support an individual perceived they had high or low social support was not associated with greater depressive symptoms or body dissatisfaction in the presence of weight stigma.

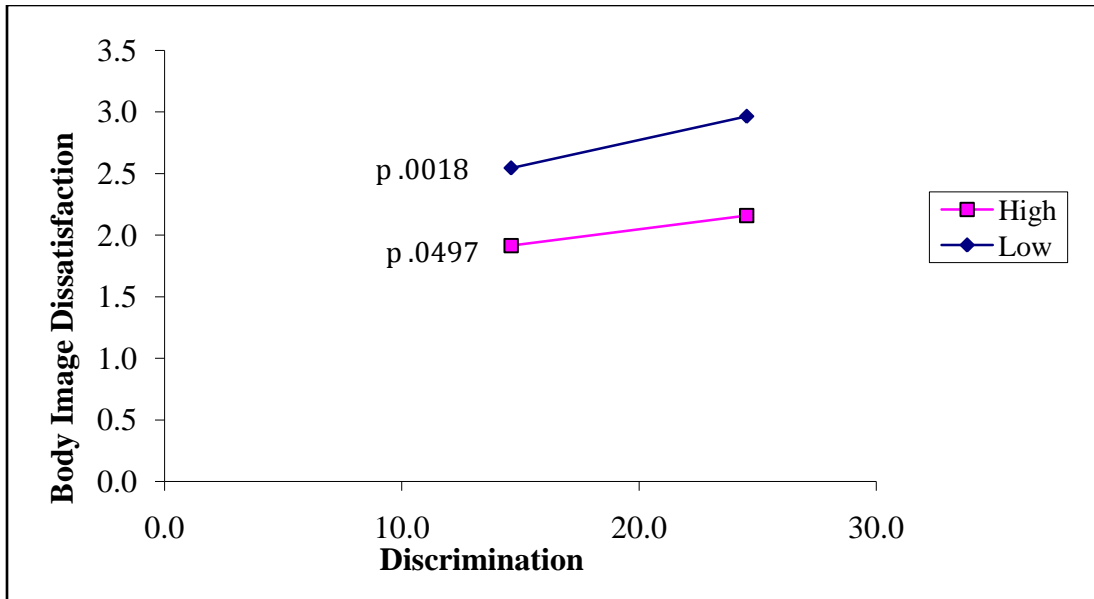
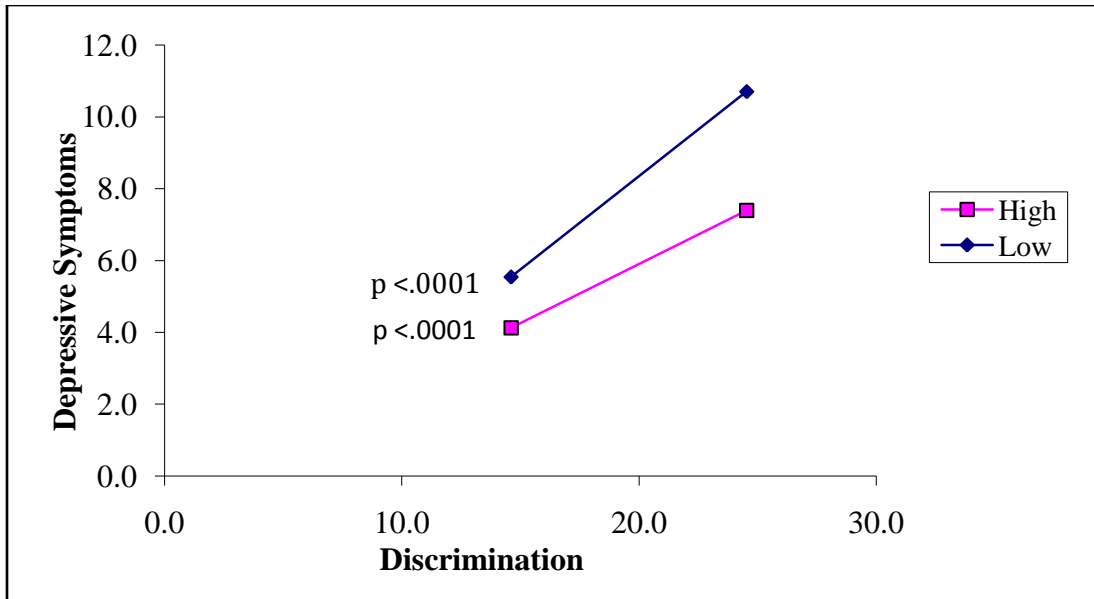


Figure 15. Moderated effect of Perceived Social Support and Discrimination in predicting of Body Dissatisfaction.

Perceived social support moderated the relationship between discrimination and body dissatisfaction. Perceived social support moderated the slope of the line. The slope of the line represents the relationship between discrimination and body dissatisfaction. The height of the line indicates more body dissatisfaction so those with low social support are experiencing more body dissatisfaction associated with discrimination. The steepness of the line shows the strength of relationship between perceived social support and body dissatisfaction, which is stronger for those with low social support.



*Figure 16.* Moderated effect of Social Support and Discrimination predicting Depressive Symptoms.

Perceived social support moderated the relationship between discrimination and depressive symptoms. Perceived social support moderated the slope of the line. The slope of the line represents the relationship between discrimination and depressive symptoms. The height of the line indicates more depressive symptoms so those with low social support are experiencing more depressive symptoms associated with discrimination. The steepness of the line shows the strength of relationship between perceived social support and depressive symptoms, which was stronger for those with low social support.

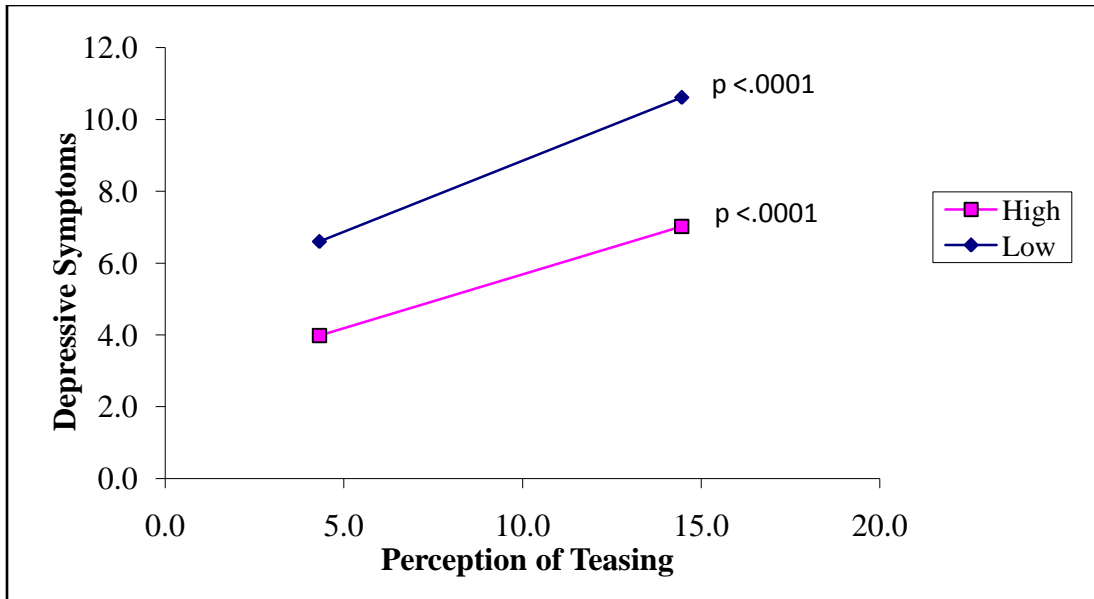


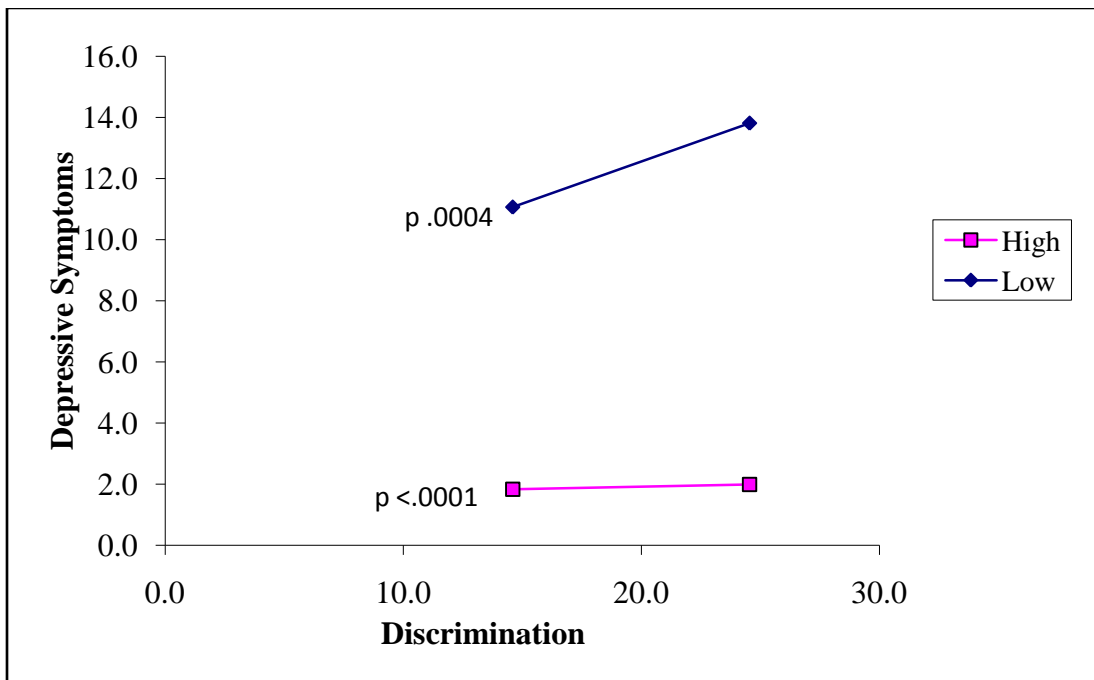
Figure 17. Moderated effect of Perceived Social Support and Teasing in predicting Depressive Symptoms.

Perceived social support moderated the relationship between teasing and depressive symptoms. Perceived social support moderated the slope of the line. The slope of the line represents the relationship between teasing and depressive symptoms. The height of the line indicates more depressive symptoms so those with low social support were experiencing more depressive symptoms associated with teasing. The steepness of the line shows the strength of relationship between perceived social support and depressive, which was stronger for those with low social support.

An additional question that was addressed was whether or not state self-esteem moderated the relationship between weight stigma and psychosocial outcomes. Stated simply if individuals with high or low state self-esteem experienced weight stigma



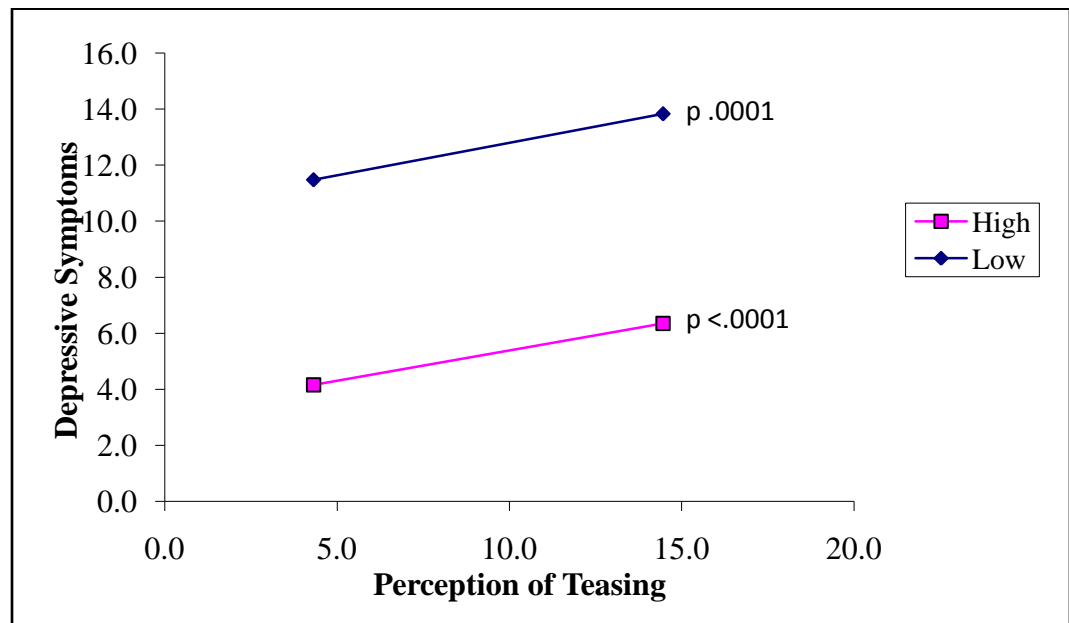
differently therefore associated with body dissatisfaction and/or depressive symptoms. Moderation was not supported for state self-esteem, bullying, discrimination and teasing predicting body dissatisfaction. Moderation was also not supported for state self-esteem and bullying predicting depressive symptoms. Stated differently regardless of the level of self-esteem an individual perceives they have high or low state self-esteem did not result in greater depressive symptoms or body dissatisfaction associated with weight stigma.



*Figure 18.* Moderated effect of State Self-esteem and Discrimination in predicting Depressive Symptoms.

State self-esteem moderated the relationship between discrimination and depressive symptoms. State self-esteem moderated the slope of the line. The slope of the

line represents the relationship between discrimination and depressive symptoms. The height of the line indicates more depressive symptoms so those with low state self-esteem were experiencing more depressive symptoms associated with discrimination. The steepness of the line shows the strength of relationship between state self-esteem and depressive, which was stronger for those with low state self-esteem.



*Figure 19.* Moderated effect of State Self-Esteem and Teasing predicting Depressive Symptoms.

State self-esteem moderated the relationship between teasing and depressive symptoms. State self-esteem moderated the slope of the line. The slope of the line represents the relationship between teasing and depressive symptoms. The height of the line indicates more depressive symptoms thus those with low state self-esteem were experiencing more depressive symptoms associated with teasing. The steepness of the

line shows the strength of relationship between state self-esteem and depressive, which is similar for those with both low and high state self-esteem.

Another question of interest was to evaluate if overweight and obese individuals who experienced weight stigma also experienced more depressive symptoms and body dissatisfaction than their underweight and normal weight counterparts. Moderation was not supported for underweight, normal weight, overweight and obese individual for bullying and discrimination on the outcomes of depressive symptoms and body dissatisfaction nor was moderation supported for teasing predicting depressive symptoms for all weight categories.

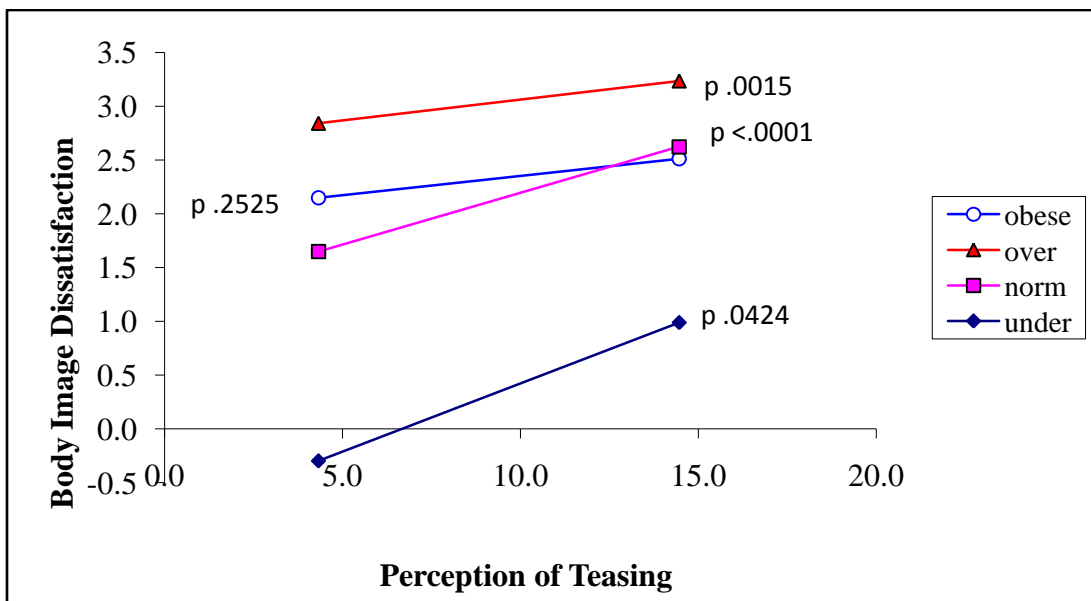


Figure 20. Moderated effect of Teasing and Perceived Weight predicting Body Dissatisfaction.

Perceived weight moderates the relationship between teasing and body dissatisfaction. Perceived weight moderated the slope of the line. The slope of the line represents the relationship between teasing and body dissatisfaction. The height of the

line indicates more body dissatisfaction so those that were heavier experience more body dissatisfaction associated with teasing. The steepness of the line shows the strength of relationship between perceived weight and body dissatisfaction, which was stronger for those who are underweight. This finding may be attributed to underweight individuals being teased for other reasons than their weight such as overall appearance.

In sum, the secondary questions were analyzed by running general linear modeling in SAS. Five relationships were moderated: discrimination and state self-esteem predicting depressive symptoms; teasing and state self-esteem predicting depressive symptoms; discrimination and perceived social support predicting depressive symptoms and body dissatisfaction; teasing and perceived social support predicting depressive symptoms. Thus indicating that experiences differed based on level of state self-esteem and perceived social support with those with lower social support and state self-esteem experiencing more psychosocial outcomes.

A different question evaluated whether overweight and obese individuals had different weight stigma experiences due to their state self-esteem. No moderation was supported for any weight category given regardless of their state self-esteem level.

Two additional questions sought to answer if overweight and obese individuals experienced more weight stigma than their underweight and normal weight counterparts and if self-esteem level differed based on weight status. Both of these questions were evaluated by running a one-way ANOVA with one predictor and the results are presented in Tables 33 and 34.

Table 33

## Analysis of Variance for Weight Stigma and Perceived Weight

Source	df	F	MS	$\eta^2$	p
Discrimination	3	4.83	117.5	.0150	.0024**
error	949		24.3		
Teasing	3	98.05	1918.3	.2366	<.0001**
error	949		19.6		

Note.  $\eta^2$  approximated by reporting  $R^2$ . \* $p < .05$ . \*\* $p < .01$ .

Based on the F the model for discrimination was not a good model although significant for predicting perceived weight. However, teasing was a good predictor of perceived weight and the overall model was a good based on the approximated value of eta. Overall, the analysis shows that the means are different for each level of perceived weight for discrimination and teasing. It can be said that as weight increases so does the experience of discrimination and teasing.

Table 34

## Analysis of Variance for Self-esteem and Perceived Weight

Variables	df	F	MS	$\eta^2$	p
Trait Self-esteem	3	15.53	487.35	.0468	<.0001**

error	949		31.38		
State Self-esteem	3	33.99	4365.19	.0997	<.0001**
error	921		128.43		

---

Note.  $\eta^2$  approximated by reporting  $R^2$ . \* $p < .05$ . \*\* $p < .01$ .

The model for state self-esteem was a good model based on the F statistic. State self-esteem was a good predictor of perceived weight based on the size of eta. Although, the F statistic for trait self-esteem was smaller the model was still significant predicting perceived weight.

In summary, weight stigma experiences differed due to weight category and self-esteem level differed based on weight category. The models for teasing and state self-esteem were better models depicting differences in experiences based on weight category.

In chapter 5, a brief interpretation of the results will be presented. In addition, limitations, implications for education, practice and research as well as recommendations for future research are described.

## CHAPTER FIVE

### Discussion, Limitations, Implications for Education, Practice and Research and Future Research

#### *Introduction*

This study sought to understand the relationship between weight status, weight stigma, depressive symptoms and body dissatisfaction and to explore the mediating role of self-esteem and weight stigma. Further, this study investigated the moderating role of self-esteem, weight stigma and perceived weight in predicting depressive symptoms and body dissatisfaction.

#### *Study Summary*

This study used a non-experimental exploratory correlational online survey design to determine the prevalence of weight stigma among college students and to explore the effects of such experiences on depressive symptoms and body dissatisfaction. The sample consisted of 955 college students who meet the criteria of enrolled in undergraduate courses at USF Tampa campus, 18 to 21 years of age, able to read and understand English, access to the internet and the able to use a computer to complete the online survey. All participants completed the online survey on a secure server with no randomization of the survey questions as described in chapter 3.

Descriptive demographic data were obtained. The sample included 787 females (82%) and 168 males (18%) of which 710 were Caucasians (76%), 99 Hispanics (11%), and 59 African Americans (6%). The mean age for this sample was 19.7 years. Approximately 65% (626) of the sample was under weight or normal weight and 35% (326) was overweight or obese according to their BMI. In contrast, 70% (672) perceived themselves to be under weight or normal weight whereas, 30% (281) perceived themselves to overweight and obese. This sample was very homogenous with the majority of the participants being Caucasian, juniors in college and female.

To evaluate the relationship of weight status, weight stigma, depressive symptoms and body image, correlations were run initially followed by regressions to identify the best predictor for the outcomes to get a clearer understanding of the relationships for the first two hypotheses under investigation. Covariance testing was performed for age, gender and race. Gender and race were checked by running a one-way analysis of variance (ANOVA) for both outcomes. Gender was significant in the prediction of body dissatisfaction only thus retained for subsequent analyses predicting body dissatisfaction therefore a limited gender analysis was performed. Age was tested as a covariate by running correlations and thus was not a significant covariate for either outcome. For hypotheses three through five multiple regressions were used to evaluate the relationship among the variables following the Baron and Kenny approach (1986). General linear modeling was used to test the presence of moderation for the secondary aims to investigate differences in experiences by participants.



## *Discussion*

This research is important because it highlights the stigmatizing experiences of college students. What this research adds to the literature is the evaluation of the role of self-esteem in the prediction of depressive symptoms and body dissatisfaction as a mediator and moderator. In addition, perceived control did not moderate stigmatizing experiences in the prediction of psychosocial health. This research demonstrated that self-esteem in particular state self-esteem functioned as both a mediator and moderator in predicting depressive symptoms and body dissatisfaction. In addition, perceived social support was found to moderate weight stigma predominately for depressive symptoms.

Discrimination and teasing were the most frequently reported stigmatizing experiences by college students with 96% reported being discriminated against due to age and gender. Although most participants reported being discriminated against or feeling discrimination due to age it is interesting to note that over a fourth of the sample attributed such experiences to their weight with 21% attributing discrimination due to being overweight and 7% due to being underweight. Approximately 29% reported being teased with only 8% of participants being bullied with those most frequently reporting teasing or being called names as the type of bullying experienced. Thus illustrating that college students experience weight bias like adolescents and adults (Eisenberg et al., 2006; Carr & Friedman, 2005; Eisenberg et al., 2003; Neumark-Sztainer et al., 2002a).

The sample was randomly selected for this study from eligible undergraduate students at the University of South Florida (USF), Tampa campus. All participants in this research study were full-time or part-time undergraduate students between the ages of 18

and 21. The response rate was less than optimal (6%) but nonetheless an adequate sample was obtained. This study is unique in that very few investigations have explored the stigmatizing experiences of college students.

*Selection of best predictors.* The best predictors of body dissatisfaction and depressive symptoms were selected by running a series of linear regressions. Based on the linear regressions and the literature the following variables were selected for subsequent use in the remaining analyses. Perceived weight was selected for the weight status domain. Discrimination and teasing were selected for the weight stigma domain and state self-esteem for the self-esteem domain. These predictors explained the most variation in the outcomes than BMI and bullying thus being significant predictors and retained for further analysis.

Body mass index and perceived weight explained a small amount of variance in depressive symptoms however, both weight status variables were positively related to depressive symptoms indicating overweight and obese individuals experienced more depressive symptoms. It is suggested that in the larger population heavier individuals may experience greater depressive symptoms than their normal or underweight counterparts. Similarly, BMI and perceived weight were positively related to body dissatisfaction, thus indicating that as BMI and perceived weight increased body dissatisfaction also increased.

Discrimination, teasing and bullying were significant positive predictors of depressive symptoms, thus indicating the more stigmatizing experiences the more depressive symptoms associated with those experiences. In the case of body

dissatisfaction, teasing appeared to be a positive predictor demonstrating that as teasing increased so did body dissatisfaction with females experiencing more dissatisfaction.

State and trait self-esteem were negative predictors of depressive symptoms signifying the higher the self-esteem the fewer depressive symptoms reported thus high levels of self-esteem could preserve the psychosocial health of individuals. Similarly, in regards to body dissatisfaction, state self-esteem was a negative predictor with and without gender in the model. Thus, the higher the state self-esteem the lower body dissatisfaction reported for females.

*Weight-related variables and psychosocial health.* Hypotheses one and two sought to explore the relationship between weight-related variables (weight status and weight stigma) on depressive symptoms and body dissatisfaction. Hypotheses one and two looked at these relationships between predictors and outcomes by examining the Pearson correlations. Hypothesis one and two were supported by the data. Depressive symptoms were found to be positive weakly related to body mass index (BMI), perceived weight and bullying and moderately related to discrimination and teasing thus indicating a positive relationship that as weight perceived or actual and weight stigma experiences increased so did depressive symptoms and vice versa. Body dissatisfaction was found to be positive weakly related to discrimination and bullying, moderately related to teasing, and strongly related to BMI and perceived weight indicating that as weight actual or perceived and weight stigma increased so did body dissatisfaction and vice versa. The results of these hypotheses establish a positive relationship between BMI, perceived weight, discrimination, teasing and bullying and depressive symptoms and body

dissatisfaction. The hypothesized relationships were consistent with the literature that a positive relationship would be expected as stigmatizing experiences increase as well as weight body dissatisfaction would be greater.

Overall, teasing was moderately related to the psychosocial outcomes of depressive symptoms and body dissatisfaction. Discrimination was moderately related to depressive symptoms. Actual and perceived weight had a strong direct relationship with body dissatisfaction. So the more stigma experienced and the higher the weight the greater the depressive symptoms and body dissatisfaction.

Hypotheses three through five were mediational hypotheses which sought to explain some of the direct influence of the predictor on the outcome through a third variable. These hypotheses were tested using multiple regression in a sequential manner. The findings are not causal in nature, rather relational suggesting a possible explanation for the relationships without establishing cause and effect so caution should be exercised when interpreting these findings since this study was not experimental in nature.

*Self-esteem as a mediator.* Hypothesis three evaluated the mediating role of self-esteem between weight-related variables and depressive symptoms. For hypothesis three, there were four models that found significant for partial mediation, which means that part of the influence of the predictor on the outcome was mediated. The four models supported for mediation were teasing and state self-esteem predicting depressive symptoms, discrimination and state and trait self-esteem predicting depressive symptoms and bullying and state self-esteem predicting depressive symptoms. These models are suggesting that part of the total effect of bullying, discrimination and teasing on

depressive symptoms goes through state and/or trait self-esteem to get a clear picture of the relationship between these variables. Stated differently state self-esteem significantly mediates the relationship between weight stigma and psychosocial well-being suggesting that given the experience of weight stigma acute changes in self-esteem may lead to the development of depressive symptoms although there is a direct effect of weight stigma on depressive symptoms. Specifically, in the case of bullying, as bullying experiences increased so did self-esteem, which may have led to a decrease in depressive symptoms. Similarly, more discriminatory or teasing experiences were associated with higher levels of self-esteem and subsequent fewer depressive symptoms. Mediation was not supported for self-esteem mediating the relationship between perceived weight and depressive symptoms; trait self-esteem mediating the relationship between discrimination or teasing and depressive symptoms, which may indicate that other factors influence or mediate these relationships. Failure to support mediation can be due to measurement error of the predictor. A probable solution would be to use a validated scale to assess perceived weight.

Hypothesis four sought to evaluate the mediating role of self-esteem between weight-related variables and body dissatisfaction. Four models were significant for partial mediation. The following models were significant: perceived weight and state self-esteem predicting body dissatisfaction, bullying and state self-esteem predicting body dissatisfaction and teasing and state self-esteem predicting body dissatisfaction. These models suggests that at higher perceived weight and experiences of bullying and teasing and may be associated with acute changes in self-esteem thereby making an individual

susceptible to body dissatisfaction even though there is a direct effect of teasing and perceived weight on body dissatisfaction. Notably the more teasing experienced the more body dissatisfaction also the greater the perceived weight the more body dissatisfaction. In the mediated model the more bullying or teasing the lower the self-esteem and thus the more body dissatisfaction; likewise, the higher the perceived weight the lower the self-esteem and thus the more body dissatisfaction in the mediated model. Mediation did not reach significance for perceived weight and trait self-esteem, bullying and trait self-esteem or discrimination and self-esteem predicting body dissatisfaction suggesting that self-esteem may not be associated with body dissatisfaction in the hypothesized manner or measurement error may have been the reason mediation was not supported. State self-esteem strongly mediated the relationship between weight and weight stigma in the prediction of depressive symptoms and body dissatisfaction with the greatest impact in the prediction of depressive symptoms.

*Weight stigma as a mediator.* Hypothesis five evaluated the mediating role of weight stigma between weight status and self-esteem. For hypothesis five two models were significant for partial mediation which are perceived weight and teasing predicting state and trait self-esteem. These models suggest that given the individuals' perceived weight and experiences of teasing due to their weight may lead to changes in their state and trait self-esteem. In other words it can be speculated that the greater the perceived weight the more teasing experienced and subsequent decrease in state self-esteem although the higher the level of perceived weight the lower the self-esteem. Teasing had a small but significant mediating effect on self-esteem and psychosocial health. Research

has found that weight-based teasing mediated the relationship between overweight and self-esteem (Davison & Birch, 2002). Further, the research found that weight-based teasing was associated with poorer self-esteem among adolescents (Eisenberg et al., 2003) and African American children (Young-Hyman, Schlundt, Herman-Wenderoth, & Bozylinski, 2003). Although the literature supports teasing as a mediator, this study did not examine the levels of self-esteem as a mediator but did support a relationship between teasing and self-esteem. Two additional models that were significant for partial mediation were perceived weight and teasing predicting body dissatisfaction and depressive symptoms. These models suggest that, given the perceived weight of the individual, experiences of teasing can lead to depressive symptoms and body dissatisfaction although there is some direct effect of perceived weight on body dissatisfaction, depressive symptoms and state and trait self-esteem. This is consistent with the literature. Weight bias has been found to mediate the relationship between weight and psychological difficulties (Cattarin & Thompson, 1994; Davison & Birch, 2002). Furthermore, the literature has reported that weight-related teasing more strongly predicted body dissatisfaction than actual weight which further supports teasing directly influencing body dissatisfaction (Thompson et al., 1995). In addition, weight-based teasing among adolescents was associated with increased depressive symptoms (Eisenberg et al., 2003). In contrast, weight-based teasing was found to mediate the relationship between BMI and body dissatisfaction (Lunner, Werthem, Thompson, Paxton, McDonald & Halvaarson, 2000). The analysis failed to support mediation for perceived weight and bullying or discrimination in the prediction of state or trait self-esteem and body dissatisfaction and

depressive symptoms. This may be due to the hypothesized relationships not being associated in the hypothesized fashion or due to measurement error of perceived weight and bullying. A validated scale for perceived weight needs to be utilized in future research. A more reliable scale for bullying and a specific weight-based discrimination scale may improve the reporting of such experiences and thus being able to detect such relationships.

*Control and social support as moderators.* The secondary aims of this investigation sought to examine the presence of moderation for perceived control and perceived social support for weight and weight stigma, respectively. The hypothesized relationship that individuals with low control would experience more depressive symptoms and body dissatisfaction was not supported since no moderation was found. Other factors may influence the relationship of this complex phenomenon. However, the literature illustrates a relationship between low self-esteem and those believed to have control over their overweight and positive self-esteem among those who attributed overweight to external causes (Pierce & Wardle, 1997). The hypothesized relationship that social support would buffer the relationship of weight stigma on depressive symptoms and body dissatisfaction was partially supported. Five models were found to be significant for moderation: discrimination and state self-esteem predicting depressive symptoms, discrimination and perceived social support predicting body dissatisfaction and depressive symptoms, teasing and perceived social support predicting depressive symptoms and teasing and perceived weight predicting body dissatisfaction. These models indicate that the experiences differ across all groups or level of the moderator



with the outcome. For instance, experiences of discrimination differ based on the level of state self-esteem in predicting depressive symptoms. Individuals with lower state self-esteem experienced more depressive symptoms that may be attributed to discrimination. Similarly, experiences of discrimination and teasing depending on the level of social support may result in depressive symptoms and body dissatisfaction. Individuals with low social support experienced more depressive symptoms and body dissatisfaction associated with stigmatizing experiences. Furthermore, teasing experiences differed based on perceived weight level and body dissatisfaction thus suggesting the higher the perceived weight level the more teasing experiences and subsequent greater body dissatisfaction. Low social support and state self-esteem reveal that individuals with low self-esteem experience greater depressive symptoms and body dissatisfaction as well as those with little or no social support are unable to buffer stigmatizing experiences and have negative psychosocial outcomes. These analyses answer the call for more research examining weight stigma as a moderator for negative psychological outcomes (Puhl & Latner, 2007).

*Weight differences.* Two additional questions investigated in this study were if overweight and obese individuals experienced more stigma than their normal and underweight counterparts and if self-esteem differed based on weight status. The model predicting teasing was a good model indicating that experiences of teasing differed based on perceived weight status however the model for discrimination failed to predict differences based on perceived weight. It can be speculated that as perceived weight increases so does teasing and discrimination which is consistent with the literature. The

research on weight stigma suggests that vulnerability to weight bias may be greater at higher levels of obesity (Puhl & Latner, 2007). The models predicting differences in state and trait self-esteem based on weight status were good although state self-esteem was a better predictor suggesting that self-esteem differed based on perceived weight, thus suggesting that individuals who perceived themselves as heavier may have lower self-esteem. This notion is supported by the literature in that Miller and Downey (1999) found that perceived weight was a better predictor of self-esteem than actual weight.

This research supports the literature that weight related teasing is associated with negative psychological outcomes specifically depressive symptoms (Eisenberg et al., 2003) and body dissatisfaction. In addition, this study supports weight stigma being related to negative psychosocial outcomes in this case low self-esteem, depressive symptoms and body dissatisfaction. What this research adds to the weight stigma literature is that college students' experience weight stigma. Self-esteem serves as both a mediator and moderator in the prediction of college students' psychosocial health however, it is unclear if stigma is attributed to the overweight and obese individuals as a group or external factors. According to Crocker and Major (1989) stigma can protect the self-esteem of an individual if they attribute such bias to people who are overweight as a group and not themselves or if they attribute bias towards to the perpetrator's own bias and not to them as individuals. Weight stigma mediated the relationship between perceived weight and negative psychosocial outcomes.

Research on weight stigma is relatively new, however; the research is strong enough to show that weight bias is powerful and pervasive. Negative attitudes toward

individuals who are obese are easily exacerbated suggesting that fat jokes, teasing, and derogatory portrayals of obese people in the media intensify bias (Teachman, Gapinski, Brownell, Rawlins & Jeyaram, 2003).

### *Limitations*

These results are specific to the college students at the University of South Florida during the study period. There are several limitations to the generalizability of these research findings. First, the results can not be generalized to racial or ethnic groups due to the lack of diversity in the study sample and no racial or ethnic differences were examined. It is unknown if racial and ethnic minorities had the same experiences as Caucasians. In addition, complete gender differences were not examined in this study either so it is unknown whether or not males and females experienced weight stigma at the same rates or if they responded to that stigma in a similar fashion. Further, the results may be subject to gender bias since females were more likely to participate than males. In addition, due to the limited age of the sample between 18 and 21 these findings cannot be generalized to students younger or older than the age range specified. Furthermore it is unknown if students outside the specified age range had the same experiences or responded in a similar fashion. Second, all measures were self-report which may have been biased by recall and or response bias by the participants since the experiences could have been traumatizing so some may have felt compelled to report less stigma or consequences of such stigma. In addition, due to responses being self-reported the responses are subject to the social desirability effect of fatigue effect. Third, since the sample was derived from all individuals meeting the eligibility requirements there is a

possible volunteer effect in that the healthy or worried well more likely participated. It can be speculated that this was present in this study since most of the sample were normal in weight as opposed to more participants being overweight or obese. Fourth, the study was cross-sectional in nature so therefore cause and effect cannot be established. Furthermore, the temporal relationship of the variables is unclear or unknown so it cannot be said with certainty that the psychosocial outcomes were the result of the weight stigma experiences or if depressive symptoms or body dissatisfaction led to more stigmatizing experiences due to weight. Fifth, in this study a 4-point Likert-type scale was used for the State Self-esteem Scale instead of a 5-point Likert-type scale as the instrument was designed, therefore the scale may have not detected acute changes in the self-esteem of the participants and it is unknown if the psychometric properties are the same. Sixth, the Contour Drawing Rating Scale was modified for presentation online and the questions were modified to be specific to this research study so the scale primarily focused on ascertaining body dissatisfaction. However, no psychometric properties were computed for the scale to examine the reliability and validity after such modifications although it was pilot tested with graduate nursing students at the University of South Florida Tampa campus. Seventh, a validated scale for perceived control was not used so it is uncertain if the investigator-created question truly captured the concept. In addition, the validity and reliability of the question assessing the amount of control the participants perceived they had over their weight is unknown. Likewise perceived weight, another investigator-created question with unknown reliability and validity, was used as a categorical/ordinal level variable. Additionally, the Gatehouse Bullying Scale was modified to ascertain

bullying due to weight. The psychometric properties of this scale are unknown. Finally, because a more conservative alpha level was used for hypothesis testing, some relationships were nonsignificant that may have been significant at the conventional alpha level of .05.

### *Implications*

The findings of this study indicate that college students experience weight stigma. Individuals at higher weight levels experience more depressive symptoms and body dissatisfaction than those at lower levels. The more stigmatizing experiences the student reported the more depressive symptoms and body dissatisfaction they experienced. State self-esteem functioned as a mediator and a moderator in this study suggesting that state self-esteem levels differ among those at different perceived weight levels. The more the student was stigmatized the lower the state self-esteem and thus greater amounts of depressive symptoms and body dissatisfaction. Further the greater the weight the more teasing and the lower the self-esteem, which differs from the self-protective properties of stigma (Crocker & Major, 1989).

*Education.* The findings of this study suggest that more concerted efforts to educate health providers needs to be undertaken. Obesity education needs to take place in schools especially nursing and medical school where these future professionals will be interacting with patients of varying weights to be sensitive to the unique needs of the individual who is overweight or obese. In addition, these students need to be educated about the psychosocial and health consequences of obesity to arm them to be patient advocates given the rise of obesity in our society. In addition, future generations of

nursing students need to be taught the sociocultural impact of overweight and weight stigma in the nursing curriculum. Understanding the true nature and extent of obesity and weight stigma is an essential component of an effective strategy to prevent and treat obesity and its sequelae. Health care providers and the public need to be taught the meaning and use of the BMI. In addition, more practical consumer education regarding nutrition is needed in the sense that culturally relevant and easy to implement changes are discussed with patients with each clinical encounter.

*Practice.* Nurses and nurse practitioners are uniquely positioned to assess and evaluate the effects of patients' weight stigma on their overall physical and psychosocial health. In addition, nurses can educate their patients regarding preventing overweight and obesity through nutrition counseling, promotion of physical activity and weight monitoring by tracking BMI. Furthermore, nursing professional organizations should disseminate evidence-based clinical guidelines for the treatment and management of overweight and obesity but also develop obesity prevention programs. Nurses are well skilled in providing therapeutic counseling and education to patients in the treatment, management and prevention of overweight and obesity across the lifespan by doing so the prevalence of weight stigma will also decrease. Nurse practitioners can provide the individualized continuity of care that is needed for the treatment and management of obesity. Additionally, nurse practitioners can be advocates for their patients who are overweight and obese lobbying for parity in legislation and helping patients get access to the care needed. The findings of this research indicate the importance of health care providers reinforcing healthy lifestyles and physical activity during clinical encounters

with patients. Health care providers are challenged to recognize at-risk individuals and be aware of the sociocultural influences in the prevention and treatment of obesity. Nurse practitioners can assess the psychosocial health of patients at each clinical encounter to ascertain if the patient is experiencing weight stigma and help patients to effectively cope with the psychosocial consequences. In addition, nurses and nurse practitioners need to become knowledgeable about ways to enhance the self-esteem and social support of individuals experiencing weight stigma and then connect to the appropriate services. Patients need to understand that obesity contributes greatly to disability, morbidity and mortality. Health care providers in a variety of settings play a major role in the management of obesity and weight stigma. These providers should attempt to ensure that their patients have a good understanding of the risks and consequences of obesity and health information about the prevention of obesity and thus weight stigma.

*Research.* The findings indicate the importance for additional research to further explore the relationship between weight stigma and psychosocial health. In addition, nurses need to participate in research that answers questions regarding the effect of weight stigma on stress and cardio-reactivity. Nurses should engage in more exploratory and experimental research that evaluates the causal relationship between weight stigma and psychosocial health across the lifespan. Health care professionals and nurses in particular need to engage in interdisciplinary efforts that emphasize behavioral and community-based research in addressing adolescent obesity in general and weight stigma specifically in high-risk populations. More weight stigma research is needed to establish the prevalence of weight stigma among diverse populations and to establish a temporal

relationship between weight stigma and poor psychosocial health. In addition, research needs to be conducted on interventions to reduce weight stigma and negative psychological outcomes and to evaluate prevention strategies. Research evaluating self-esteem and social support improvement as prevention strategies of poor psychosocial outcomes associated with weight stigma are needed.

### *Future Research*

Although the proposed model did not completely explain the relationship between weight, weight stigma, self-esteem, body dissatisfaction and depressive symptoms, it appears that the heavier the individual perceives themselves to be the more teasing experienced and the more negative their psychosocial health. State self-esteem functioned as both a mediator and moderator indicating that depending on the individuals' level of self-esteem they may be protected from the negative consequences of stigmatizing experiences. Overall, this research demonstrates that perceived weight, teasing, self-esteem and social support are central factors in weight stigma. This area of research needs to become a priority to investigate the various pathways through which weight stigma may impact health. Additional research needs to be conducted using more college age and adolescent populations exploring the effect of weight stigma on psychosocial health. The findings of this study should be replicated using a more diverse population because it is unknown whether minority populations have the same experiences as those reported in this sample. In addition, mixed methods research needs to be conducted to provide a rich evaluation of weight stigma. More experimental studies exploring the cause and effect relationship of weight stigma and psychosocial health are



needed as well. Few studies have utilized methods that suggest cause and effect as a result more experimental studies with large samples is needed. The cause of weight stigma needs to be explored and better understood. Research has documented weight stigma toward obese people in a variety of settings yet it is a widely acceptable form of bias. Research has demonstrated that fat jokes and teasing might intensify bias. Further the health consequences of weight stigma needs clarity. The research is inconsistent about whether weight stigma causes psychosocial consequences or if the consequences are a result of obesity. More research testing weight stigma reduction interventions are essential and additional research on new stigma prevention methods should be conducted.

Many unanswered questions remain. For example, how does weight stigma affect the stress levels of children, adolescents and young adults? Are health outcomes worse for those individuals who experience weight stigma at higher levels of obesity? Does weight stigma have different health implications for individuals of different gender, ages and ethnic backgrounds? Do different forms of or sources of weight stigma have a different impact on the health of adolescents and young adults? These questions have critical importance for understanding the health of obese individuals and for preventing additional adverse medical and psychological conditions.

## Conclusion

This study demonstrated that college students experience weight stigma at rates similar to adolescents or children. It should be noted that previous studies utilized primarily overweight and obese samples whereas this study did not. For this population psychosocial consequences of weight stigma are as real as the medical consequences of obesity. Results were consistent that females experienced more dissatisfaction than males related to teasing. State self-esteem functioned both as a mediator and moderator indicating that the individual's self-esteem can either protect them or make them more susceptible to weight stigma, particularly teasing in this case. Perceived social support appeared to moderate the experiences of weight stigma with more support seeming to buffer stigmatizing experiences. The greater the perceived weight the more dissatisfaction experienced which is consistent with the literature. Overall, the psychosocial health of college students needs to be protected from the effects of stigmatizing experiences due to weight. Additional research is needed to examine the temporal order and causality of the relationships observed in the current study, as well as to ascertain the generalizability of the current pattern of relationships to individuals of different ethnic and racial backgrounds as well ages.

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## APPENDICES



## Appendix A: Rosenberg Self-Esteem Scale (SES)

### Rosenberg Self-Esteem Scale (Rosenberg, 1965)

The scale is a ten item Likert scale with items answered on a four point scale - from strongly agree to strongly disagree. The original sample for which the scale was developed consisted of 5,024 High School Juniors and Seniors from 10 randomly selected schools in New York State.

Instructions: Below is a list of statements dealing with your general feelings about yourself. If you strongly agree, circle SA. If you agree with the statement, circle A. If you disagree, circle D. If you strongly disagree, circle SD.

- |     |  |    |   |   |    |
|-----|--|----|---|---|----|
| 1.  | On the whole, I am satisfied with myself.                                  | SA | A | D | SD |
| 2.* | At times, I think I am no good at all.                                     | SA | A | D | SD |
| 3.  | I feel that I have a number of good qualities.                             | SA | A | D | SD |
| 4.  | I am able to do things as well as most other people.                       | SA | A | D | SD |
| 5.* | I feel I do not have much to be proud of.                                  | SA | A | D | SD |
| 6.* | I certainly feel useless at times.   | SA | A | D | SD |
| 7.  | I feel that I'm a person of worth, at least on an equal plane with others. | SA | A | D | SD |
| 8.* | I wish I could have more respect for myself.                               | SA | A | D | SD |
| 9.* | All in all, I am inclined to feel that I am a failure.                     | SA | A | D | SD |
| 10. | I take a positive attitude toward myself.                                  | SA | A | D | SD |

## Appendix B: State Self-Esteem Scale (SSES)

### Current Thoughts

This is a questionnaire designed to measure what you are thinking at this moment. There is, of course, no right answer for any statement. The best answer is what you feel is true of yourself at this moment. Be sure to answer all of the items, even if you are not certain of the best answer. Again, answer these questions as they are true for you **RIGHT NOW**.

**1 = Not at All**

**2 = A Little Bit**

**3 = Somewhat**

**4 = Very Much**

1. I feel confident about my abilities.	1	2	3	4
2. I am worried about whether I am regarded as a success or failure.	1	2	3	4
3. I feel satisfied with the way my body looks right now.	1	2	3	4
4. I feel frustrated or rattled about my performance.	1	2	3	4
5. I feel that I am having trouble understanding things that I read.	1	2	3	4
6. I feel that others respect and admire me.	1	2	3	4
7. I am dissatisfied with my weight.	1	2	3	4
8. I feel self-conscious.	1	2	3	4
9. I feel as smart as others.	1	2	3	4
10. I feel displeased with myself.	1	2	3	4
11. I feel good about myself.	1	2	3	4
12. I am pleased with my appearance right now.	1	2	3	4
13. I am worried about what other people think of me.	1	2	3	4
14. I feel confident that I understand things.	1	2	3	4
15. I feel inferior to others at this moment.	1	2	3	4
16. I feel unattractive.	1	2	3	4
17. I feel concerned about the impression I am making.	1	2	3	4
18. I feel that I have less scholastic ability right now than others.	1	2	3	4

Appendix B: (continued)

- |   |   |   |   |   |
|---|---|---|---|---|
| 19. I feel like I'm not doing well.     | 1 | 2 | 3 | 4 |
| 20. I am worried about looking foolish. | 1 | 2 | 3 | 4 |

## Appendix C: Multidimensional Scale of Perceived Social Support (MSPSS)

### Multidimensional Scale of Perceived Social Support

Instructions: We are interested in how you feel about the following statements. Read each statement carefully. Indicate how you feel about each statement.

Circle the "1" if you **Very Strongly Disagree**

Circle the "2" if you **Strongly Disagree**

Circle the "3" if you **Mildly Disagree**

Circle the "4" if you are **Neutral**

Circle the "5" if you **Mildly Agree**

Circle the "6" if you **Strongly Agree**

Circle the "7" if you **Very Strongly Agree**

	Very Strongly Disagree	Strongly Disagree	Mildly Disagree	Neutral	Mildly Agree	Strongly Agree	Very Strongly Agree
1. There is a special person who is around when I am in need.	1	2	3	4	5	6	7
2. There is a special person with whom I can share joys and sorrows.	1	2	3	4	5	6	7
3. My family really tries to help me.	1	2	3	4	5	6	7
4. I get the emotional help & support I need from my family.	1	2	3	4	5	6	7
5. I have a special person who is a real source of comfort to me.	1	2	3	4	5	6	7
6. My friends really try to help me.	1	2	3	4	5	6	7
7. I can count on my friends when things go wrong.	1	2	3	4	5	6	7
8. I can talk about my problems with my family.	1	2	3	4	5	6	7
9. I have friends with whom I can share my joys and sorrows.	1	2	3	4	5	6	7
10. There is a special person in my life who cares about my feelings.	1	2	3	4	5	6	7
11. My family is willing to help me make decisions.	1	2	3	4	5	6	7

Appendix C: (continued)

12. I can talk about my problems with  
my friends.                    1      2      3      4      5      6      7

Appendix D: Perception of Teasing Scale (POTS)

Appendix E: Gatehouse Bullying Scale (GBS)

Gatehouse Project  
Lyndal Bond 2001

**Gatehouse Bullying Questionnaire**

**1 a) Has anyone TEASED YOU or CALLED YOU NAMES because of your weight recently?**

- 1 Yes
- 0 No

**If yes ...**

**1 b) how often?**

- 1 Most days
- 2 About once a week
- 3 Less than once a week

**1c) How upsetting was it when you were teased?**

- 1 Not at all
- 2 A bit
- 3 I was quite upset

**2 a) Has anyone spread RUMOURS ABOUT YOU because of your weight recently?**

- 1 Yes
- 0 No

**If yes ...**

**2 b) How often?**

- 1 Most days
- 2 About once a week
- 3 Less than once a week

**2 c) How upsetting were the rumors?**

- 1 Not at all
- 2 A bit
- 3 I was quite upset

**3 a) Have you been DELIBERATELY LEFT OUT OF THINGS because of your weight recently?**

- 1 Yes
- 0 No

Appendix E: (continued)

**If yes ...**

**3 b) How often?**

- 1 Most days
- 2 About once a week
- 3 Less than once a week

**3 c) How upsetting was it being left out of things?**

- 1 Not at all
- 2 A bit
- 3 I was quite upset

**4 a) Have you been THREATENED PHYSICALLY OR ACTUALLY HURT because of your weight by another student recently?**

- 1 Yes
- 0 No

**If yes ...**

**4 b) How often?**

- 1 Most days
- 2 About once a week
- 3 Less than once a week

**4 c) How upsetting was it being threatened or hurt?**

- 1 Not at all
- 2 A bit
- 3 I was quite upset

Lyndal Bond 2001



## Appendix F: Life Experiences Scale (LES)

The following section will ask you about personal feelings. These questions are important, as our feelings may directly affect our health or influence how we respond to health issues.

1. In your day-to-day life have you had the following experiences (CIRCLE ONE ANSWER FOR EACH).

	<u>Often</u>	Sometimes	<u>Rarely</u>	<u>Never</u>
a. You are treated with less courtesy than other people.	<b>1</b>	2	3	4
b. You are treated with less respect than other people.	<b>1</b>	2	3	4
c. You receive poorer service than other people at restaurants or stores.	<b>1</b>	2	3	4
d. People act as if they think you are not smart.	1	2	3	4
e. People act as if they are afraid of you.	1	2	3	4
f. People act as if they think you are dishonest.	1	2	3	4
g. People act as if they're better than you are.	1	2	3	4
h. You or your family members are called names or insulted.	1	2	3	4
i. You are threatened or harassed.	<b>1</b>	2	3	4
j. People ignore you or act as if you are not there.	1	2	3	4

2. Were any of the following reasons why you had these experiences? (CIRCLE ONE ANSWER FOR EACH)

	<u>NO</u>	<u>YES</u>	<u>,DOESN'T APPLY</u>
a. Race	<b>1</b>	2	3
b. Ethnicity	1	2	3
c. Gender	1	2	3
d. Age	1	2	3
e. Income level	1	2	3
f. Language	1	2	3
g. Religion	1	2	3
h. Overweight body	1	2	3
i. Underweight body	1	2	3
j. Clothing, jewelry, or style of dress	1	2	3
k. Other physical appearance	1	2	3
l. Who you hang out with	1	2	3

## Appendix G: Contour Drawing Rating Scale (CDRS)

Appendix G: (continued)

1. Using the contour rating scale above, select the drawing that most accurately depicts how you “think” you look.
2. Using the contour rating scale above, select the drawing that most accurately depicts how you “feel” you look.
3. Using the contour rating scale above, select the drawing that most accurately depicts how you “want” you look.

Appendix H: Physician Health Questionnaire 9 (PHQ-9)

**PHQ-9**

<b>Over the <u>last 2 weeks</u>, how often have you been bothered by any of the following problems?</b>	<b>Not at all</b>	<b>Several days</b>	<b>More than half the days</b>	<b>Nearly every day</b>
1. Little interest or pleasure in doing things.....	0	1	2	3
2. Feeling down, depressed, or hopeless.....	0	1	2	3
3. Trouble falling or staying asleep, or sleeping too much.....	0	1	2	3
4. Feeling tired or having little energy.....	0	1	2	3
5. Poor appetite or overeating.....	0	1	2	3
6. Feeling bad about yourself — or that you are a failure or have let yourself or your family down.....	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television.....	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed? Or the opposite — being so fidgety or restless that you have been moving around a lot more than usual.....	0	1	2	3
9. Thoughts that you would be better off dead or of hurting yourself in some way.....	0	1	2	3

### About the Author

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