WEIGHT BASED STIGMA: THE IMPACT OF PERCEIVED CONTROLLABILITY OF WEIGHT ON SOCIAL SUPPORT

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CHAPTER 1

INTRODUCTION

Stigma and Health: An Overview

Despite the increased awareness of genetic and biological factors contributing to weight and the recent political and social climate that disapproves of discrimination and stereotyping, weight-related prejudice and stigma remains socially acceptable (Puhl & Brownell, 2001). Additionally, because standards for the thin-ideal are unattainable for most women, the population affected often includes women who may be at a healthy weight, but are still considered overweight according to social ideals (Green, Cameron, Polivy, Cooper, Liu, Leiter & Heatherton, 1997). Overweight individuals are stigmatized as unattractive, lazy and unmotivated (Allon, 1982; Harris, 1990). Additionally, individuals who are overweight are less likely to receive adequate social support (Carr & Friedman, 2006); a tool that is instrumental for weight loss efforts and improvements in physical health (Marcoux, Trenkner, & Rosenstock, 1990). A large reason for these support deficits may be the belief in the controllability of weight. Society as a whole sees weight as something within the individual’s control, and often ascribes blame to the individual and withholds sympathy (Crandall & Reser, 2005). As such, although overweight individuals may benefit from the presence of social support, they lack good
support if family and friends follow society’s lead and view weight as controllable. This dissertation seeks to assess the impact of weight-related stigma on mental health and the buffering properties of perceived emotional social support for perceived stigma. Further, the meditational effects of instrumental social support in the relationship between stigma and health, as well as the impact of weight controllability on perceived social support, will be examined. In the introduction that follows, I will define stigma, review the literature pertaining to stigma’s impact on mental and physical health, discuss the potential moderators of this relationship, and introduce the concept of weight controllability. I will review the literature pertaining to the impact of weight controllability perceptions on hypothetical support provided, and discuss its potential generalizability with family and friends. Finally, all hypotheses and a brief description of sample characteristics and statistics utilized will be presented.

Definition of Stigma

A stigmatized individual possesses, or is perceived to possess an attribute, or set of attributes that marks them as different and leads them to be devalued by others through the use of negative evaluations and stereotypes (Crocker, Major & Steele, 1999; Major & O’Brien, 2005). In other words, the stigmatized individual has a “mark” that distinguishes them from “normal” society and the person is seen as less than human (Dovidio, Major & Crocker, 2000). Goffman (1963) states a person with a stigmatizing mark is seen as “spoiled” or flawed.

Each stigma carries with it a set of stereotypes and characteristics thought to be associated with the stigma. For example, skin color is an attribute that, for some, carries
with it many negative connotations. People are viewed through a racial lens whereby they are assumed to share the traits their skin color implies. Another very recognizable mark is that of being overweight. People, especially women, who are overweight, are seen as sharing many attributes, such as being unattractive, less intelligent, less successful, and less likeable (Adams, 1977; Harris, 1990; Harris, Harris & Bochner, 1982). The result of having a stigmatizing mark is that these accompanying stereotypes breed prejudice and discrimination (Crocker, Major & Steele, 1999).

Stigma can be viewed from two different perspectives. First, social stigma is a measure of the levels or amount of stigma within society. In other words, social stigma reflects a violation of social norms. Each stigmatization is assumed to be equally distributed amongst those with a given stigmatizing mark (see Crocker, Major & Steele, 1999 for a review). For instance, from society’s viewpoint, stigma should be equally given to all those who are obese. This perspective is valuable when discussing stigma in general and the development of prejudice. However, when examining the effects of stigma on the stigmatized individual, this perspective falls short. Stigma is not equally experienced by all people. Thus, perceived stigma is the opportunity to measure stigma from the stigmatized individuals’ point of view. This distinction is important as many stigmatized individuals may ignore or be unaware of societal stigma, while other individuals may be hyperaware of societal stigma. To address the goals of this dissertation, I will focus on perceived stigma, as it is more likely to take into account individual differences in stigma experience.
Dimensions of Stigma

Given the breadth of stigma as a construct, many researchers have attempted to create a typology for stigma. Goffman (1963) divided stigmas into three types. First, “abominations of the body” refers to physical deformities, such as blindness. Second, “blemishes of individual character” refers to stigmas that were the responsibility of the stigmatized. Drug addictions, unemployment, obesity, and child abuse could fall into this category. Finally, “tribal identities” refers to characteristics that identify one as part of a group, including race, religion, or nationality.

Jones and colleagues (1984) went further and organized stigma into six major dimensions. The first category, disruptiveness, deals with how often or to what degree a stigma interferes with interpersonal interactions, with society looking down upon stigmas that are socially debilitating, such as stuttering. The second category, course of the mark, refers to the potential worsening of the stigma over time. For instance, congenital blindness remains constant while Parkinson’s disease or multiple sclerosis will worsen over time. Peril is the level of danger of the stigma to others. A contagious disease would ignite greater fear than congenital blindness or overweight, leading to higher levels of stigma. The fourth category, aesthetics, refers to the attractiveness of the stigma. The more unattractive or disfiguring the stigmatizing mark is, the more stigma is experienced. Origin of the stigma is seen as the person’s level of control, or responsibility for the stigma. A judgment is made as to whether the mark is accidental, congenital or intentional. As the level of responsibility on the part of the stigmatized increases, so does the level of stigma experienced. Finally, concealability refers to how obvious or visible
one’s stigma is. For example, HIV status or homosexuality may be hidden, but facial
disfigurement or weight are very difficult to conceal. While these dimensions are helpful
as an organizational system, researchers argue that some of these dimensions are more
important than others.

Crocker, Major and Steele (1998) argue that of all these dimensions, visibility
(concealability) and controllability (origin) are the most salient dimensions of stigma. A
visible stigma cannot be easily hidden from others, and provides a readily available
schema with which to view the stigmatized (Crocker, Major & Steele, 1998). As a result,
people with an unconcealable stigma are more aware that people may be judging them
based on their stigma (Kleck & Strenta, 1980). One with an unconcealable stigma may
anticipate, notice, and perceive more episodes of prejudice and discrimination (Crocker,
Major and Steele, 1998). Consequently, stigma and discrimination are unavoidable and it
is likely that those with a visible stigma may experience more mental and physical health
consequences (Crocker, Major & Steele, 1998).

Controllability of the stigma also has a large impact on how the stigmatized are
perceived and how they are treated. Those with a controllable stigma oftentimes
experience harsher judgments from the perpetrator and do not receive much sympathy
(Seacat, Hirschman, & Mickelson, 2007). For example, Weiner, Perry and Magnusson
(1988) found that those with controllable stigmas such as obesity and drug abuse were
less liked, less likely to be pitied, elicited more anger, and were given less assistance.
Furthermore, prejudice is seen as acceptable when the stigma is controllable. In a study
conducted by Rodin and colleagues (1989), subjects were given scenarios of
discrimination (e.g. rejected for a job) and asked to rate how prejudiced these actions were. If the stigma was a controllable one (e.g. obesity due to overeating), rejection was seen as reasonable and was rated as less prejudiced than if the stigma was identified as uncontrollable (obesity due to a hormonal imbalance). Moreover, because the stigmatized are also likely to see their condition as controllable, they are more likely to internalize stigma, blame themselves and experience more mental and physical health consequences (Mak, Chueng, Law, Wu, Li & Chung, 2007).

Impact of Stigma on Mental and Physical Health

As alluded to above, research has consistently shown that perceived stigma is related to worse mental health and physical health, functioning like a stressor. Pearlin (1989) suggests that individuals in stigmatized lower-status positions (e.g. race, gender) are continually confronted with stressful experiences that highlight the limitations of their position, exposing their unequal access to resources and opportunities. Because this group membership is ongoing, the role of the stigmatized often includes repeated exposure to stress.

The effects of this stressor have been well-documented in the literature. First, societal stigma has a link with mental health, with individuals who have controllable stigmas sharing high rates of mental health problems. High levels of depression have been found within the gay adolescent population (Bell, Weinberg & Hammersmith, 1981), among those with Hepatitis C (Golden et al., 2005), and in overweight children (Xie, et al., 2005). Second, levels of perceived stigma are correlated with mental health problems. Mickelson (2001) found that among parents of special needs children,
perceived stigma was positively related with depressive symptomatology. Further, within an HIV+ women’s sample, perceived stigma was related to mental functioning, such that increased perceptions of stigma were positively related to distress (Clark, Linder, Armistead, Austin, 2003). Similarly, Friedman and colleagues found that among overweight individuals, perceived weight-based stigmatization was positively associated with depression and general psychiatric symptoms. (Friedman, Reichmann, Costanzo, Zelli, Ashmore, Musante, 2005).

One mechanism that may drive the relationship between stigma and mental health is that of self-esteem. One’s sense of identity being attacked may lead to loss of self-worth (Crocker & Major, 1989, Crocker, Major & Steele, 1998), which in turn can impact mental health (Franck, De Raedt, & DeHouwer, 2007). Stigmatizing experiences and discrimination bring awareness to the stigmatized that their identity is devalued by others, and may be internalized by the stigmatized (Crocker & Major, 1989). Further, if one believes their own stigma is controllable, they may be even more likely to internalize their stigma and suffer deleterious effects.

Physical health problems also afflict the stigmatized. Stigmatized individuals are at a greater risk for strokes, hypertension, and coronary heart disease (Jackson, 1996; Krieger, 1990, Major & O’Brien, 2005). Borell and colleagues found that racial discrimination was inversely correlated with physical health, such that higher levels of discrimination were associated with lower levels of perceived health (Borrell et al., 2006). Moreover, stigma not only contributes to the onset of disease, it also results in worse health and improvement in ill populations. For example, Richards and colleagues
(2001) found that among those with psoriasis, perceived stigmatization was related to a greater degree of disability.

Stigma can also affect health in a more indirect way by being a barrier to receiving proper care. For instance, Stall and colleagues (1996) reported that 59% of their sample of gay/bisexual men had never been tested for HIV due to fear of the social consequences. Similarly, Fortenberry et al. (2002), in a more generalizable sample of both men and women, found that those with an awareness of STD-related stigma were less likely to be tested for STD’s. Lastly, overweight women are less likely to undergo colorectal screening, likely due to a fear of being judged by physicians (Rosen & Schneider, 2004).

Finally, stigma may reduce an individual’s practice of good health behaviors. Vanable and colleagues (2006) found that among HIV positive men, perceived HIV-related stigma was related to poorer medication adherence. Relatedly, HIV-positive individuals who reported higher levels of social discrimination reported worse health behaviors (e.g. lack of exercise, eating a less balanced diet; Bianchi, Zea, Poppen, Reisen, & Echeverry, 2004).

In sum, social and perceived stigma have an impact on mental health, such that stigmatized groups exhibit greater levels of depression, and perceived stigma is positively related to depressive symptomatology. Further, it is likely that self-esteem plays a role through the process of internalization. Finally, social and perceived stigma have an impact on physical health such that stigmatized groups have greater health problems, and perceived stigma is related to worse health. Possible mechanisms include direct effects on
physiological systems (e.g. cortisol, blood pressure), as well as avoidance of health care and a decrease in healthy behaviors.

Despite the consistent findings, it is important to note that effect sizes in these studies vary and do not exhibit a universal, strong impact of stigma, suggesting the presence of a moderator in the relationship between stigma and mental health. Moderators may include an individual’s sensitivity to stigma, variability in coping resources, and variability in severity of stigma. This dissertation will focus on variability in coping resources (namely, social support) and the severity of the perceived stigma.

*Moderation of the Stigma-Health Relationship*

**Social Support**

One moderator of the relationship between stigma and mental and physical health is that of social support. Broadly defined, social support is a coping resource, which traditionally has consisted of emotional, instrumental or informational assistance from one’s social circle (see Thoits, 1995 for a review). Rodriguez and Cohen (1998) expanded this definition and stated that emotional support refers to empathy, reassurance, and caring. For example, if one was diagnosed with an illness, a family member or friend might offer a shoulder to cry on or words of comfort. Instrumental support refers to the provision of material goods and services, such as financial aid or help with childcare. In this case, if one is ill, supporters might supply meals or drive their friend/family member to the doctor’s office. Informational support is the provision of knowledge. For example, if one is recently diagnosed with an illness, information from those who have experienced...
the illness would be invaluable. Because receiving information can be inaccurate (Griggs, Sorbero, Mallinger, Quinn, Waterman, Brooks, 2007) and may sometimes be seen negatively (e.g. if informational support is not requested; Cutrona, 1990), this dissertation will instead focus on emotional and instrumental support.

Additionally, social support can vary as to whether it is received or perceived. Received support refers to the actual receipt of emotional, instrumental and informational support (Rodriguez & Cohen, 1998). Although there is some evidence to suggest benefits of received support (Boehmer, Luszczyńska, & Schwarzer, 2007), perceived support (levels of support that are seen as available to an individual) is more strongly related to positive outcomes (Cohen & Wills, 1985; Helgeson, 1993; Wethington & Kessler, 1986). Received support can result in feelings of obligated reciprocation, and the support could have been unwanted. Perceived support on the other hand, reflects more of a feeling that one has resources that are accessible and ready and gives people a sense of security, thereby resulting in better mental and physical health (Rodriguez & Cohen, 1998). Thus, this dissertation will focus on perceived emotional and instrumental support.

Although there has been some debate, generally speaking, there is much evidence to suggest that social support can act as a buffer for stress (see Cohen & Wills, 1985 for a review). The stress-buffering model suggests that pre-existing levels of support “buffer” or protect people against the harmful nature of stress. If one believes that they have resources available to them, they may feel a better sense of efficacy, changing their appraisal of the situation (Cohen & Wills, 1985; Wethington & Kessler, 1986). Additionally, having esteem and acceptance from others may enhance internal resources.
(e.g., purpose, self-worth) that may influence coping abilities (Cohen & Wills, 1985). In fact, social support has been shown to lessen the impact of a variety of stressors on mental and physical health, including work-related stress and life stress (Hagahari, Tarumi, & Miller, 1998; Schlebusch & Cassidy, 1995).

Not all researchers agree that social support acts as a stress-buffer, however. There is some evidence to suggest that social support has main effects (Rodriguez & Cohen, 1998) or can be a mediator in the stress-health relationship (Kaniasty & Norris, 1993; Lepore, Evans & Schneider, 1991; Quittner, Glueckauf, & Jackson, 1990). The important factor when determining mediation versus moderation is whether social support is changed because of the stressor (mediation) or is assumed to exist prior to and be unaffected by the stressor (moderation). Conceptually, social support may perform all three functions.

Social support, specifically being loved or cared about, can have a direct impact on mental health. Additionally, because it is likely in place prior to stressors (e.g., stigma-related stress), it can enhance mental/physical health and act as a buffer for stressors (i.e., the effects of social support are stronger in the presence of a stressor). Moreover, stress may enact social support resources which will, in turn, have an effect on mental health (mediational hypothesis).

In the case of weight-based stigma, it is likely that some forms of social support are available to participants whether or not they are experiencing stigma, while others were brought about as a result of stigma. For example, emotional social support likely exists continuously, with family and friends providing a sense of belonging and being cared for even in the absence of life events and stress. In addition to having a main effect
on well-being, this pre-existing resource may negate the effects of stigma and improve the well-being and health of those who are stigmatized. On the other hand, instrumental support, such as helping one eat healthy or exercise, likely arises as an attempt to help a stigmatized individual cope with the situation, implying more of a meditational relationship. In other words, the support is triggered by the stigma, which in turn, has an impact on well-being. In order to further examine the impact of social support on the stigma-health relationship, this dissertation will focus on the stress-buffering properties of emotional social support, and the meditational role of instrumental social support.

**Visibility and Controllability**

Dimensions of stigma, such as visibility and controllability may also moderate the relationship between stigma and health. As discussed earlier, stigmas that differ in visibility and controllability are likely to have differential impacts on mental and physical health. The visibility of stigma may have a direct impact on mental health in that visible stigmas are more likely to bring with them more frequent discriminatory experiences, which may contribute to more mental health problems (Crocker, Major & Steele, 1999).

Controllability may also indirectly affect mental and physical health through its impact on social support. As shown above, people with stigmas that are controllable receive harsher judgments and less sympathy (Seacat, Hirschman, & Mickelson, 2007). If controllability of stigma is impacting social norms, it seems logical to assume that family and friends will make blame attributions and feel less sympathy as well. Thus, controllability of the stigma may have an effect on the social support family and friends are willing to provide. That is, those with perceived controllable stigmas are less likely to
receive social support, leading to lower perceptions of available support, thereby again keeping stigmatized individuals from reaping the benefits this support affords.

Although it has not been directly examined, there is some evidence to suggest that controllability of stigma may affect social support from family and friends. First, research has shown that strangers give less support to those with controllable stigmas. Participants in a lab experiment, who were exposed to an individual with a controllable stigma were more likely assign blame and give less pity (Schwarzer & Weiner, 1991). Furthermore, when participants were given a script to read that discussed an individual with a controllable stigma, participants posited that the stigmatized would receive less social support in a real-world situation than those with an uncontrollable stigma (Schwarzer & Weiner, 1991). Moreover, when researchers asked participants how willing they would be to help a hypothetical individual in a vignette, they found that participants who attributed blame to the stigmatized were less willing to offer aid (Weiner, Perry, & Magnusson, 1988). Finally, those with seemingly controllable stigmas do report receiving lower levels of support. Overweight and obese individuals report lower levels of social support than their thinner counterparts (Carr & Friedman, 2006); and, Crandall and Coleman (1992) found that 17% of their sample of HIV patients reported receiving less support after diagnosis. To conclude, social support appears to moderate the relationship between stigma and health, while visibility and controllability may impact social support, which in turn, will impact mental health.
One stigma that is likely to have a far-reaching impact is weight-based stigma. The number of individuals who are overweight or obese is substantial. Flegal and colleagues reported in 2002 that approximately two-thirds of the population was considered overweight according to their Body Mass Index (BMI) classification, a tool that estimates body fat levels based on height and weight (CDC, 2007). Further, Mokdad and colleagues (2003) reported that based on results from a nationally representative sample, an estimated 21% of the U.S. population is considered obese (BMI ≥ 30). This percentage corresponds to approximately 44 million obese adults. The percentage of obese also varied by geographical location, with some areas of the country reporting rates of over 26% (Mokdad, et al., 2003). Even more concerning, the numbers are rapidly increasing in the United States. In a different nationally representative sample, Ogden et al. found that the percentage of overweight and obese adults and adolescents rose almost 2% between 1999 and 2004. By 2004, over 32% of their sample was obese (Ogden, Carroll, Curtin, McDowell, Tabak, & Flegal, 2006). Further, those who are not classified as overweight by conventional standards may still feel overweight, as standards for body weight presented in the media are often unattainable and at the lower end of the spectrum. (Grabe, Ward, & Hyde, 2008). As a result, many “normal” weight women, may feel dissatisfied with their body and feel pressure to lose weight despite being clinically healthy.

Even though the majority of the population is overweight, stigma and prejudice surrounding these individuals continue to be problematic, as prejudice against the
overweight is still viewed by many as acceptable (Puhl & Brownell, 2001). Additionally, stigma and prejudice against the overweight are likely to be encountered in virtually every aspect of their life. Evidence of prejudice and stereotypes has been reported among co-workers and superiors in the workplace (Roehling, 1999), teachers (Neumark-Sztainer, Story & Harris, 1999), medical practitioners (Maroney & Golub, 1992; Teachman & Brownell, 2001; Young & Powell, 1985), peers (Latner & Stunkard, 2001), and in the media (Blaine & McElroy, 2002; Greenberg, Eastin, Hofshire, lachlan & Brownell, 2003). Stereotypes associated with being overweight or obese are numerous. Staffieri (1972) found that when children were asked to describe the characteristics of a person based on a silhouette, obese silhouettes were described as dirty, lazy, sloppy, mean, ugly, stupid, sad and lonely. Additionally, adults have described overweight people as unattractive (Harris, Harris & Bochner, 1982), and discontent with themselves (Rodin, Silberstein & Striegel-Moore, 1984). Even medical professionals describe the obese as “weak-willed” (Monello & Mayer, 1963).

Because prejudice often leads to discrimination, those who are classified as obese experience higher levels of institutional and day-to-day discrimination than those of normal weight. Workplace bias is especially prevalent (Fikkan & Rothblum, 2005), with overweight individuals frequently reporting being fired and not being hired due to their weight. Moreover, Carr and Friedman (2005), using a nationally representative sample, found that overweight and obese individuals reported more workplace discrimination (e.g. interpersonal mistreatment) than normal weight individuals. In addition to high reports of workplace discrimination/bias, (Rothblum, Brand, Miller & Oetjen, 1990),
overweight individuals also make less money than their thinner counterparts for a comparable job (Sargent & Blanchflower, 1994). Register and Williams (1990) found that overweight women made 12% less than their thinner counterparts. In addition to workplace discrimination, Carr and Friedman (2005) also reported that very obese (BMI \( \geq 35 \)) individuals experienced the highest levels of discrimination and reported more interpersonal and major discrimination than normal-weight individuals.

This stigma is especially pernicious for women. Research has found that weight stigma is more prevalent for women, with women reporting more frequent episodes of teasing, harassment and discrimination because of weight. Moreover, they also experience a wider variety of these negative weight-based experiences than men (Cossrow, Jeffrey, & McGuire, 2001). Chen and Brown (2005) found that fewer overweight and obese women were chosen as mates than overweight and obese men, suggesting that weight-stigma infiltrates more domains of life for women. Additionally, body standards are more difficult to attain for women (Grabe, Ward & Hyde, 2008), and more women are dissatisfied with their bodies (Penkal & Kurdek, 2007). Meland and colleagues (2007) found in a sample of adolescents that young women reported more frequent dieting and higher levels of body dissatisfaction than the young men in their cohort. Additionally, Etilé (2007) found that among the normal-weight women in her sample, over 40% felt that their weight was not what they considered “ideal”. Because of these unrealistic standards, these women may experience stigma despite being medically healthy. Vartanian and Shaprow (2008) conducted a study with undergraduate females and found that in the normal-weight sample, 85% had experienced some form of weight
stigma in their lifetime. Consequently, the number of women who are or feel overweight is quite substantial. Although research does not dismiss the weight concerns of men, and men do report weight-based stigma (Puhl & Brownell, 2006), because the levels and types of weight-based stigma differ by gender, this dissertation will focus on the experiences of women.

Dissertation Study Hypotheses

Perceived Stigma and Health

Why is weight such a frequent and severe stigma? First, the stigma of overweight is visible (although there are ways to deemphasize it with clothes, if the individual is only slightly overweight). For those with a visible stigma, life must be lived through the lens of their stigma and with an awareness that others are judging them (Crocker, Major & Steele, 1998). This awareness may lead to an alteration in behavior and cognitions (Steele & Aronson, 1995) such as avoidance of social situations as a way of escaping stigmatizing experiences (Hughes & Degher, 1993). Hence, overweight individuals will likely experience stigma more frequently, and the experience of discrimination will be more difficult to avoid. Second, their stigma is perceived by society as controllable (Crandall, 1994; Crandall & Martinez, 1996). Thus, according to theorists, they will experience more intense stigma and be judged more harshly (DeJong, 1980). In fact, Crandall (1994) found that higher levels of dislike towards fat people were correlated with one’s judgments of the controllability of weight. That is, those who believed that
weight problems resulted from a lack of willpower exhibited higher levels of anti-fat prejudice.

The stigma and discrimination of being overweight have been found to be damaging to one’s mental and physical health. Friedman and colleagues (2005) found that among obese individuals, frequency of stigmatizing experiences was related to depression, accounting for 11% of the variance, even after controls were added. In regards to physical health, in a study conducted by Faith and colleagues, weight-based victimization in children was negatively associated with physical activity (Faith, Leone, Ayers, Moonseong, & Pietrobelli, 2002).

Stigma may also impact physical health through the mechanism of health behaviors. For example, Vartanian and Shaprow (2008) found that college women who experienced weight stigma were more likely to avoid exercise. Further, weight has been shown to have an indirect effect on health through weight’s connection to SES. First, there is an overrepresentation of overweight individuals in lower SES categories (Carr & Friedman, 2005) - potentially because of discrimination as overweight individuals are likely not hired for prestigious jobs and are often viewed as undesirable as employees (Harris, Harris & Bochner, 1982). Second, lower SES status carries with it many other mental and physical health side-effects (e.g. anxiety, depression). Thus, overweight individuals are likely to suffer from disproportionate levels of mental and physical health problems (Everson, Maty, Lynch, & Kaplan, 2002). In order to replicate findings regarding weight-based stigma and health, the first hypothesis of this dissertation is that
perceived weight-related stigma will be correlated with mental and physical health outcomes (see Figure 1).

H1a: Perceived stigma will negatively impact mental health, such that increased stigma will be related to greater depressive symptomatology.

H1b: Perceived stigma will negatively impact physical health behaviors, such that increased stigma will be related to a decrease in weight-related health promoting behaviors (i.e. eating behaviors and exercise).

*Emotional Support as a Moderator*

One way of helping to buffer the stigma of being overweight may be emotional social support. If overweight individuals do receive support, it can be beneficial for mental health as well as physical health. In a study of obese individuals, Dierk and colleagues (2006) found that social support was related to subjective well-being. Social support has been found to have stress-buffering properties in studies with obese individuals. In a study of Chinese youth, the stress of weight-based stigma (referred to in the study as the stress of peer-isolation) was moderated by perceived availability of support (Xie, et al., 2005), such that those who had support were less affected by the presence of stigma. Because emotional social support is assumed to be trait-like, or stable, the second hypothesis of this dissertation proposes emotional social support as a buffer for the stress of perceived weight-based stigma. Although social support will be beneficial for everyone, it is hypothesized that high levels of emotional support from friends will buffer individuals who are experiencing high levels of perceived weight-based stigma (see Figure 2).
Figure 1. Relationship between perceived stigma and health.

Figure 2. Social support as a buffer.
**H2a:** Emotional social support from family/friends will moderate the relationship between weight-related stigma and depressive symptomatology, such that emotional social support will buffer the deleterious effects of weight related stigma.

**H2b:** Emotional social support from family/friends will moderate the relationship between weight-related stigma and eating behaviors, such that, emotional social support will buffer the deleterious effects of weight related stigma.

**H2c:** Emotional social support from family/friends will moderate the relationship between weight-related stigma and exercise behaviors, such that, emotional social support will buffer the deleterious effects of weight related stigma.

*Instrumental Support as a Mediator*

On the other hand, instrumental social support is posited to function as a mediator between stigma and physical health. In other words, it is likely that the weight stigma may lead an individual to seek lifestyle changes that will reduce body weight, and thereby reduce stigma experienced. Instrumental support may be given by family and friends as a way to assist with coping efforts, and may have an impact on physical health outcomes. In fact, research has shown that overweight individuals lose more weight with the help of social support from friends and families (Marcoux, Trenker, & Rosenstock, 1989). Hypothesis 3 states that instrumental social support from family and friends will act as a mediator in the relationship between perceived stigma and health-promoting/compromising behaviors (see Figure 3).
Figure 3. Instrumental support as a mediator.
**H3a**: Instrumental social support from family/friends will mediate the relationship between weight-related stigma and eating behaviors.

**H3b**: Instrumental social support from family/friends will mediate the relationship between weight-related stigma and exercise behaviors.

*Perceived Controllability and Social Support*

Although social support is likely to be beneficial for those undergoing stigma, it might not be so easy for overweight individuals to get enough support. As previously mentioned, studies suggest that participants feel less pity and give more blame to those with a controllable stigma (e.g. weight). To my knowledge, the extension of these blame attributions to friends/family has yet to be studied directly. Family and friends may also make similar attributions about the willpower of their overweight loved one- that is, that their loved one is to blame for their weight condition. If they believe weight is controllable, it may affect the amount of social support they offer to the overweight and obese, similar to previous studies. In other words, they may also feel less pity and desire to help, especially if weight has been a chronic issue. Family members may have an unwillingness to comfort or console one who is to blame for their weight and family and friends may be tired of helping an individual that in their eyes, does not help themselves.

Although the impact of weight controllability is not known, it is shown that stigmatization is a part of family relationships of obese people (Falkner et al., 1999). Puhl and Brownell (2006) noted that over 70% of their sample had experienced stigma from familial sources. Additionally, Kinston and colleagues found that families of obese children had negative attitudes about obesity (Kinston, Loader & Miller, 1988). Thus, if
stigma exists within families, it is likely that a lack or withdrawal of social support may also exist. In fact, it has been shown that overweight individuals oftentimes lack good social support from family and friends in multiple domains. In regards to romantic relationships, overweight and obese adolescents start dating later in life, date less frequently (Bullen, Monello, Cohen & Mayer, 1963) and obese women marry less desirable spouses later in life (Fu & Goldman, 1996). Once married, however, marital quality does not differ for obese women as compared to normal-weight women (Cohen, Schwartz, Bromet, & Parkinson, 1991; Gallo, Troxel, Matthews & Kuller, 2003). The differences between obese women and their thinner counterparts lie mostly in relationships with family of origin and friends. Ali and Lindstrom (2005) found that overweight women had low levels of perceived accessible emotional and instrumental support. Moreover, Carr and Friedman (2006) report that obese individuals had significantly worse relationships with family/friends, higher levels of strain with family/friends and less positive support from friends than do normal-weight individuals.

Social support from and perceived controllability of weight by family and friends may also be impacted by family/friends’ own weight status. Many family and friends of overweight individuals may be overweight themselves and share in the stigma and experiences of their loved one. Research shows that childhood/adolescent obesity is oftentimes predicted by parental obesity (Noble, 1997), implying that those who are overweight likely share this trait with family. Additionally, results from the Framingham Heart Study revealed that not only do obese people tend to form social networks with one another, obesity is also somewhat of a contagion, as people were 57% more likely to
become obese at a later time point if they were friends with an obese individual (Christakis & Fowler, 2007). This shared stigma may impact social support and perceptions of controllability, although the direction of the influence is unknown. It may be that family and friends’ experiences with weight stigma create empathy that leads to increased provision of emotional support. Likewise, experiences with weight loss efforts may lead to greater levels of instrumental support provision (specifically, in the area of weight loss), especially if the friend/family member has had success with weight loss and believes weight is controllable. On the other hand, experiences of similarly overweight friends/families may provide less support if they have not had success with weight management or have internalized weight-stigma. In other words, if friends and family feel bad about themselves for being overweight, and believe weight management is unattainable, they are likely to project these attitudes on to their loved ones.

Thus, it may be that overweight individuals are not receiving the crucial support they need for coping with weight-related stress. Research has suggested that components of support, such as sympathy and desire to help are inversely related with controllability of stigma (Seacat, Hirschman, & Mickelson, 2007; Weiner, Perry & Magnusson, 1988), and it is logical to assume that family and friends will react in a similar way. As such, perceived controllability on the part of family and friends may be impacting the level of support they are giving. For example, the family of an obese loved one may perceive weight as something their loved one is fully responsible for. They will be unwilling to offer help if they feel it falls on deaf ears and will feel angry and frustrated with their loved one’s lack of willpower. As a result, they may tease their family member and/or
make her feel bad about her weight. Additionally, they may withhold emotional support, feeling that their family member does not deserve it, and withhold instrumental support, thinking it will be ignored.

If friends and family members share in the stigma of overweight, and feel weight is uncontrollable, it is also possible that family members may attempt to sabotage weight loss efforts and withhold support as an attempt to preserve their own feelings of worth and esteem. Therefore, the final hypothesis of this dissertation explores the relationship between the families’ and friends’ perception of controllability of weight and perceived emotional and instrumental social support from family and friends. Based on studies that examined the role of perceived controllability of weight and support provided with strangers, I predicted that those who have family/friends who believe weight is controllable will offer less emotional and instrumental support (operationalized here as help with weight-related behaviors) than those who believe weight is uncontrollable, which will in turn impact mental and physical health. Although not tested here, it is also assumed that societal stigma is the driving force behind friends’/families’ perceptions of controllability, as society and media have a large influence on our perceptions of weight controllability (Geier, Schwartz, & Brownell, 2003) (see Figure 4).

**H4a**: Those who have family who believe weight is controllable will receive less emotional social support from family/friends than those whose family/friends believe weight is uncontrollable.
Figure 4. Relationship between perceived controllability of weight and social support.
**H4b**: Those who have family/friends who believe weight is controllable will receive less instrumental social support from family/friends than those whose family/friends believe weight is uncontrollable.

*Dissertation Study*

Because spousal support quality does not appear to differ between overweight/obese and normal-weight individuals, I focus on an age demographic that typically relies on family of origin and friends for support: college-aged students (a population that is affected by weight-related issues, including weight-based stigma and high rates obesity in late adolescents; Ogden, Carroll, Curtin, McDowell, Tabak, & Flegal, 2006). Using regression analyses with the most predictors, a power analysis (conducted using the computer software G-power) suggested that based on my criteria (an estimated alpha level of .05, a desired power level of .80 and an anticipated small to medium effect size), the specific number of female college students needed for the purposes of this dissertation is an $N$ of 145.
CHAPTER 2

METHOD

Participants

As shown in Table 1, the final sample consisted of 165 women and was largely homogenous in multiple domains. In regards to race, 80.1% (133) of the women identified as White, 10.2% (17) identified as Black/African-American, 1.8% (3) identified as Hispanic, .6% (1) identified as Asian, .6% (1) identified as Native American, and 6% (10) chose Other. The mean age was 20 years (SD=3.13) with 96% of participants falling between the ages of 17 and 23. Additionally, the majority of participants were single (91.5%). According to BMI, 2.4% of the women were considered underweight (BMI<18), 66.7% of the women were considered normal weight (BMI of 18-25), 20.6% were considered overweight (BMI of 25-30), and 10.3% were considered obese (BMI >30). To reiterate, weight-based stigma can occur in under-weight, normal-weight and overweight individuals, and consequently, all women were used in analyses.

Procedure

College students were recruited using the university’s SONA system. Students signed-up for the study online and met in groups of up to 10 at a designated time and location. All participants were given a consent form and questionnaires. After completion
Table 1. *Descriptive Sample Characteristics*

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<tr>
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<th>M</th>
<th>SD</th>
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<tbody>
<tr>
<td>Age</td>
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<tr>
<td>BMI</td>
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<tr>
<td>% of overweight family</td>
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<tr>
<td>% of overweight friends</td>
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<tr>
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</tr>
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<td>White</td>
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<td></td>
<td>80.1</td>
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<tr>
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</tr>
<tr>
<td>Asian</td>
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<tr>
<td>Other</td>
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<td>Weight Categories</td>
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<td>Overweight</td>
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<tr>
<td>Obese</td>
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</table>


of questionnaires, participants were given a debriefing form explaining the purpose of the study and a request to keep the study details confidential. All participants received class credit as compensation for participating.

*Measures*

*Potential Controls*

*Sociodemographics.* Three categories of sociodemographics were assessed: age, marital status, and race/ethnicity. Marital Status had three answer options: married/cohabitating, divorced, and single. Race/ethnicity was self-identified and answer options included White, African-American, Hispanic, Native American, Asian American and Other.

*Body-Mass Index.* Body-Mass Index (BMI), a score used by the CDC to identify overweight and obese individuals, was be calculated based on an individual’s reported height and weight (http://www.cdc.gov/nccdphp/dnpa/bmi/adult_BMI/english_bmi_calculator/bmi_calculator.htm)

\[
\text{BMI} = \frac{\text{Weight in Pounds}}{(\text{Height in inches}) \times (\text{Height in inches})} \times 703
\]
Categories were determined by the following criteria established by the CDC: scores below 18 were classified as underweight, 18-25 were classified as normal weight, 25-30 were classified as overweight, and any score above 30 was classified as obese.

**Percentage of Overweight Family Members.** Percentage of overweight family members was assessed with the following question: “From 0-100%, overall, how many of your immediate family members (parents, grandparents, and siblings) are overweight with 0% representing no family members and 100% representing all family members?”

**Percentage of Overweight Friends.** Percentage of overweight friends was assessed with the following question: “From 0-100%, overall, how many of your friends are overweight with 0% representing no friends and 100% representing all friends?”

**Participant’s Perception of Weight Controllability.** Participants were asked “From 0-100%, overall, how much do you think body weight is something that is controllable (i.e. not genetic) with 0% being completely uncontrollable and 100% being completely controllable.”

**Self-Esteem.** Self-esteem was assessed using a modified version of the Rosenberg Self-Esteem Scale (RSE; Rosenberg, 1965). The questionnaire was a 9-item scale assessed on a 4-point Likert scale, ranging from strongly agree to strongly disagree. Sample items included “I feel that I have a number of good qualities” and “I take a positive attitude toward myself.” Four items were reverse-coded and a sum score was
created, with a high score representing poor self-esteem. In this study, the modified Rosenberg Self-Esteem Scale had an acceptable internal reliability ($\alpha = .87$).

*Overweight as a Child.* Being overweight as a child was assessed with the following question, “Do you believe that you were overweight as a child?” Responses were dichotomous (yes/no).

*Predictor Variables*

*Perceived Stigma.* Perceived Stigma was assessed using a modified version of a scale developed by Mickelson (2001). The scale includes eight items such as “I feel odd/abnormal because of my weight” and “People treat me differently because of my weight.” Participants are asked to rate the extent to which they agree with these items and responses are scored on a 5-point Likert scale (1 = definitely disagree; 5 = definitely agree). Two items were reverse-coded and a sum score was created. In this study, the Perceived Stigma Scale had an acceptable internal reliability ($\alpha = .84$).

*Emotional Social Support.* Perceived emotional support was assessed using an adapted version of the Perceived Social Support Scale (PSSS; Blumenthal et al., 1987) and included four items pertaining to support from family, and four items pertaining to support from friends (e.g. “My family really tries to help me, “I can talk about my problems with my friends.” ). Responses were scored on a 7-point Likert scale (1 = very strongly disagree; 7 = very strongly agree), and a sum score was created. Reliability was acceptable for family ($\alpha = .87$) and friends ($\alpha = .90$).
**Instrumental social support.** Instrumental Social Support related to physical health behaviors was adapted from the Social Support for Exercise Scale (Nothwehr, 2004). This measure was chosen in order to address instrumental support targeted to weight management and included eight items (four for family, four for friends). Participants were asked questions such as “How often do friends/family offer to eat healthy foods with you?” and “How often do family/friends offer to exercise with you.” Responses were on a 5-point Likert scale ranging from 1 (never) to 5 (very often), with the last two items being reverse coded and a sum score was created. Reliability for this measure appeared to be inadequate for both family ($\alpha = .54$) and friends ($\alpha = .53$), however, this was anticipated given that scale items do not necessarily correlate.

**Outcome Variables**

**Depression.** Depressive symptomatology was assessed using the Center for Epidemiologic Studies Depression Scale (CES-D; Radloff, 1977). The CES-D is a twenty item scale assessed on a 4-point Likert scale, ranging from rarely or none of the time (less than one day) to most or all of the time (5-7 days). Sample items included “I felt depressed” and “I could not get going.” Four items were reverse-coded and a sum score was created. In this study, the CES-D had an acceptable internal reliability ($\alpha = .91$).

**Eating Behaviors**

The first measure of health behaviors addressed dietary fat consumption. Due to the sensitive nature of dietary questionnaires and attempts to make the nature of the questionnaire less obvious, dietary habits were assessed more generally using a shortened
and modified version of a questionnaire developed by Osler and Heitmann (1996) (in lieu of a measure of dietary fats, per se). The measure was based loosely on Block’s Food Frequency Questionnaire (1990). Specifically, participants were asked how many times in a typical week they consume a variety of foods, including both healthy and unhealthy options. A variable was created summing the frequency of 6 high-fat/calorie foods: ice cream/soda, animal fats, cheese, vegetable margarine, sausages, and candy/chocolate. Responses were on a 7-point Likert scale ranging from 1 (never) to 7 (two or more times daily). A sum score was created and reliability was found to be inadequate ($\alpha = .57$), although this was also anticipated as food preferences may not necessarily correlate.

**Exercise Behaviors**

Physical activity was assessed using the Paffenbarger Physical Activity Questionnaire (PPAQ:1986). First, as recommended by Paffenbarger, participants were asked to report how many stairs they climbed on average in a day in the past year. Second, participants were asked to estimate the average number of city blocks walked in a day, over the course of the past year. Finally, participants were instructed to list any sports, leisure, or recreational activities they participated in on a regular basis during the past year. They were instructed to estimate the average number of times per week they took part in these activities and the average duration of the sessions. Additionally, they were to only include times they were physically active (i.e. not including down-time or breaks during sporting events and exercise sessions).

Based on Paffenbarger’s guidelines (1986), a score was created from these reports, indicating approximate kilocalories (kcals) expended in a typical week. First, stairs
climbed in one day were multiplied by seven, in order to get a weekly value. Then, for every 20 stairs climbed, it was estimated that 8 kcals were burned in that seven days. Likewise, city blocks walked in a day was converted to a weekly value (blocks x 7) and for every city block walked, it was estimated that 8 kcals were burned. Next, activities reported were divided into two categories based on a classification presented by the World Health Organization (2004). Activities were classified as either light or vigorous, and corresponding caloric expenditures were assigned: 5 kcals for every minute spent participating in a light activity, and 10 kcals for every minute spent participating in a vigorous activity. A final sum score was created representing number of kilocalories burned in one week. Due to the wide range of scores, a standardized form of the scale was used in analyses.

Perceived Controllability

Family Perceptions of Weight Controllability. Families’ perception of weight controllability was assessed with the following question: “From 0-100%, overall, how much does your family think your body weight is something that can be controlled by you (i.e. you should be able to lose weight if you wanted to) with 0% being completely uncontrollable and 100% being completely controllable.”

Friend Perceptions of Weight Controllability. Friends’ perception of weight controllability was assessed with the following question: “From 0-100%, overall, how much do your friends think your body weight is something that can be controlled by you
Overview of Statistical Analyses

Before testing the dissertation hypotheses, all data were cleaned, descriptive statistics were conducted for all variables (e.g. means, standard deviations, correlations between variables) and assumptions were met for multiple regression analyses. There was no evidence of multicollinearity (see Table 2). Next, preliminary analyses were

Table 2. Bivariate Correlations Between Major Study Variables

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<th>9</th>
<th>10</th>
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<tbody>
<tr>
<td>1. Perceived Stigma</td>
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<td>2. ESS Family</td>
<td>-0.10</td>
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<td>3. ESS Friend</td>
<td>-0.26 **</td>
<td>0.20 *</td>
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<tr>
<td>4. ISS Family</td>
<td>-0.23 **</td>
<td>0.32 **</td>
<td>0.12</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>5. ISS Friend</td>
<td>-0.24 **</td>
<td>0.16 *</td>
<td>0.23 **</td>
<td>0.41 **</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>6. Controllability (Family)</td>
<td>-0.08</td>
<td>0.32 **</td>
<td>0.05</td>
<td>0.35 **</td>
<td>0.29 **</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>7. Controllability (Friend)</td>
<td>-0.09</td>
<td>0.27 **</td>
<td>0.05</td>
<td>0.21 **</td>
<td>0.31 **</td>
<td>0.73 **</td>
<td></td>
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<tr>
<td>8. Dep. Symptomatology</td>
<td>0.23 **</td>
<td>-0.25 **</td>
<td>-0.14</td>
<td>-0.02</td>
<td>-0.15</td>
<td>-0.01</td>
<td>-0.07</td>
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<tr>
<td>9. Eating Behaviors</td>
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<td>0.12</td>
<td>0.03</td>
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<td>0.03</td>
<td>-0.05</td>
<td>0.12</td>
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<tr>
<td>10. Exercise Behaviors</td>
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<td>0.13</td>
<td>0.08</td>
<td>0.13</td>
<td>0.25 **</td>
<td>0.08</td>
<td>0.16</td>
<td>-0.11</td>
<td>0.08</td>
<td></td>
</tr>
</tbody>
</table>

* p<.05, **p<.01
a For ease of presentation, Emotional Social Support from Family was abbreviated.
b For ease of presentation, Emotional Social Support from Friends was abbreviated.
c For ease of presentation, Instrumental Social Support from Family was abbreviated.
d For ease of presentation, Instrumental Social Support from Friends was abbreviated.
conducted to determine which of the sociodemographic variables would be used as controls in further analyses. Bivariate correlations were conducted for continuous variables, and one-way ANOVA’s for categorical variables. Possible controls included race, age, marital status, BMI, self-esteem, being overweight as a child and percentage of family and friends who are overweight.

Hypothesis 1, which addressed the relationship between perceived stigma and mental and physical health was assessed using multiple linear regressions, with one regression for each outcome. Hypothesis 2, which addressed emotional social support as a moderator between stigma and health, was also assessed using a series of multiple linear regressions. There were six regressions conducted: stigma x emotional support from family → depressive symptomatology; stigma x emotional support from family → eating behaviors; stigma x emotional support from family → exercise behaviors; stigma x emotional support from friends → depressive symptomatology; stigma x emotional support from friends → eating behaviors; and stigma x emotional support from friends → exercise behaviors.

Hypothesis 3, which addressed instrumental social support as a potential mediator between stigma and health, and Hypothesis 4, which addressed the impact of perceived controllability on reported social support, were tested in separate analyses, using Structural Equation Modeling (with EQS software; Bentler, 2006). SEM allows for a simultaneous test of all pathways, and the ability to model measurement error of the endogenous variables.
CHAPTER 3

RESULTS

Descriptive Statistics

As shown in Table 3, the present sample reported a moderate level of perceived stigma, with 98% reporting at least some form of stigma (i.e. a score above 9), although this sample was not highly stigmatized ($M = 20.97$ out of 40). Levels of emotional support from family and friends were high. The mean level of support was almost as high as the potential range, suggesting the possibility of a ceiling effect. Instrumental support levels from friends and family were more varied, with moderate levels of support being reported. In regards to perceived controllability, this sample reported high levels of perceived controllability from both family and friends. Finally, participants reported moderate levels of fat consumption, a large range of calories burned, and fairly low levels of depressive symptomatology.

Hypotheses 1: Perceived Stigma and Health

To determine whether perceived stigma had a main effect on mental and physical health problems, multiple linear regressions were used and three separate analyses were conducted. The continuous variable of perceived stigma was entered as the predictor variable and the continuous measures of depressive symptomatology, eating behaviors
Table 3. *Descriptive Statistics of Major Study Variables*

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>SD</th>
<th>Pos. Range</th>
<th>Actual Range</th>
<th>α</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived Stigma</td>
<td>20.97</td>
<td>6.45</td>
<td>8-40</td>
<td>8-38</td>
<td>.84</td>
</tr>
<tr>
<td>Emotional Support (Family)</td>
<td>24.41</td>
<td>3.41</td>
<td>4-28</td>
<td>10-28</td>
<td>.87</td>
</tr>
<tr>
<td>Emotional Support (Friends)</td>
<td>24.01</td>
<td>3.70</td>
<td>4-28</td>
<td>11-28</td>
<td>.90</td>
</tr>
<tr>
<td>Instrumental Support (Family)</td>
<td>14.62</td>
<td>2.53</td>
<td>4-20</td>
<td>8-20</td>
<td>.54</td>
</tr>
<tr>
<td>Instrumental Support</td>
<td>13.90</td>
<td>2.71</td>
<td>4-20</td>
<td>4-20</td>
<td>.53</td>
</tr>
<tr>
<td>Perceived Controllability of Weight (Family)</td>
<td>84.88</td>
<td>15.44</td>
<td>0-100</td>
<td>0-100</td>
<td>-</td>
</tr>
<tr>
<td>Perceived Controllability of Weight (Friends)</td>
<td>83.64</td>
<td>16.45</td>
<td>0-100</td>
<td>0-100</td>
<td>-</td>
</tr>
<tr>
<td>High-Fat Foods</td>
<td>20.65</td>
<td>4.95</td>
<td>7-35</td>
<td>8-33</td>
<td>.57</td>
</tr>
<tr>
<td>Calories Burned Weekly</td>
<td>5026.79</td>
<td>5250.95</td>
<td>0-∞</td>
<td>28-26328</td>
<td>-</td>
</tr>
<tr>
<td>Depressive Symptomatology</td>
<td>15.32</td>
<td>9.95</td>
<td>0-80</td>
<td>0-50</td>
<td>.91</td>
</tr>
</tbody>
</table>

and exercise behaviors served as the outcome variables. In order to more accurately estimate the nature of this relationship, potential confounding variables were statistically controlled for. Based on preliminary analyses, for Hypotheses 1-3, self-esteem, BMI, percentage of family who are overweight and percentage of friends who are overweight, were included as control variables because each related to at least one of the study variables (See Tables 4a and 4b). Although being overweight as a child appears to meet criteria as a control variable, it seemed likely that this variable would overlap with BMI. I conducted a chi-square analysis, and found that those who were currently overweight or
### Table 4a. Bivariate Correlations between Potential Controls and Major Study Variables

<table>
<thead>
<tr>
<th></th>
<th>Age</th>
<th>BMI</th>
<th>% OW Family</th>
<th>% OW Friends</th>
<th>Poor Self-Esteem</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perceived Stigma</td>
<td>0.15</td>
<td>0.34</td>
<td>**</td>
<td>**</td>
<td>0.37</td>
</tr>
<tr>
<td>ESS Family&lt;sup&gt;a&lt;/sup&gt;</td>
<td>-0.11</td>
<td>0.01</td>
<td>-0.02</td>
<td>-0.12</td>
<td>-0.29</td>
</tr>
<tr>
<td>ESS Friend&lt;sup&gt;b&lt;/sup&gt;</td>
<td>-0.24</td>
<td>0.01</td>
<td>-0.07</td>
<td>-0.16*</td>
<td>-0.17*</td>
</tr>
<tr>
<td>ISS Family&lt;sup&gt;c&lt;/sup&gt;</td>
<td>-0.02</td>
<td>-0.19</td>
<td>*</td>
<td>-0.29**</td>
<td>-0.09</td>
</tr>
<tr>
<td>ISS Friend&lt;sup&gt;d&lt;/sup&gt;</td>
<td>-0.02</td>
<td>-0.11</td>
<td>-0.14</td>
<td>-0.19*</td>
<td>-0.14</td>
</tr>
<tr>
<td>Controll. (Family)&lt;sup&gt;e&lt;/sup&gt;</td>
<td>0.11</td>
<td>-0.11</td>
<td>-0.22**</td>
<td>-0.22**</td>
<td>-0.06</td>
</tr>
<tr>
<td>Controll. (Friend)&lt;sup&gt;f&lt;/sup&gt;</td>
<td>0.11</td>
<td>-0.10</td>
<td>-0.03</td>
<td>-0.21**</td>
<td>-0.07</td>
</tr>
<tr>
<td>Depressive Symptoms</td>
<td>0.00</td>
<td>0.04</td>
<td>-0.05</td>
<td>0.14</td>
<td>0.41</td>
</tr>
<tr>
<td>Eating Behaviors</td>
<td>-0.02</td>
<td>0.10</td>
<td>0.10</td>
<td>0.09</td>
<td>0.02</td>
</tr>
<tr>
<td>Exercise Behaviors</td>
<td>-0.14</td>
<td>-0.10</td>
<td>-0.08</td>
<td>-0.21</td>
<td>0.09</td>
</tr>
</tbody>
</table>

*p<.05, **p<.01

<sup>a</sup> For ease of presentation, Emotional Social Support from Family was abbreviated.

<sup>b</sup> For ease of presentation, Emotional Social Support from Friends was abbreviated.

<sup>c</sup> For ease of presentation, Instrumental Social Support from Family was abbreviated.

<sup>d</sup> For ease of presentation, Instrumental Social Support from Friends was abbreviated.

<sup>e</sup> For ease of presentation, Perceived Controllability of Weight (Family) was abbreviated.

<sup>f</sup> For ease of presentation, Perceived Controllability of Weight (Friends) was abbreviated.

### Table 4b. Mean Differences for Potential Control Variables

<table>
<thead>
<tr>
<th></th>
<th>Race</th>
<th>Marital Status</th>
<th>OW as a child</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>F</td>
<td>df</td>
<td>F</td>
</tr>
<tr>
<td>Perceived Stigma</td>
<td>0.80</td>
<td>5, 159</td>
<td>1.58</td>
</tr>
<tr>
<td>Emotional Support from Family</td>
<td>0.47</td>
<td>5, 159</td>
<td>0.32</td>
</tr>
<tr>
<td>Emotional Support from Friends</td>
<td>0.76</td>
<td>5, 159</td>
<td>1.77</td>
</tr>
<tr>
<td>Instrumental Support from Family</td>
<td>2.74*</td>
<td>5, 159</td>
<td>2.29</td>
</tr>
<tr>
<td>Instrumental Support from Friends</td>
<td>1.88</td>
<td>5, 159</td>
<td>5.14**</td>
</tr>
<tr>
<td>Per. Controllability of Weight (Family)</td>
<td>1.69</td>
<td>5, 159</td>
<td>0.29</td>
</tr>
<tr>
<td>Per. Controllability of Weight (Friends)</td>
<td>2.04</td>
<td>5, 159</td>
<td>0.16</td>
</tr>
<tr>
<td>Eating Behaviors (High-Fat foods)</td>
<td>0.50</td>
<td>5, 159</td>
<td>0.13</td>
</tr>
<tr>
<td>Exercise Behaviors (kcals weekly)</td>
<td>0.49</td>
<td>4, 106</td>
<td>0.67</td>
</tr>
<tr>
<td>Depressive symptomatology</td>
<td>0.27</td>
<td>5, 158</td>
<td>2.52</td>
</tr>
</tbody>
</table>

*p<.05, **p<.01, ***p<.001
obese were overweight as a child more often than expected, \(\chi^2 (3, n= 163) =16.15, p<.001\). Therefore, as BMI was included as a control, I did not choose to include being overweight as a child in subsequent analyses, as they appear to encompass the same variance.

Results indicated that, contrary to hypotheses, perceived stigma was not related to depressive symptomatology \((b=.00, se=.13, p>.05; \text{see Table 5})\), frequency of fatty foods consumed \((b= -.02, se=.07, p>.05; \text{see Table 6})\) or exercise \((b=.03, se=.02, p>.05)\), (see Table 7).

Given the lack of relationship found between perceived stigma and depressive symptomatology, and the strong relationship between self-esteem and both perceived stigma and depressive symptomatology, post-hoc analyses were conducted to evaluate the potential mediating role of self-esteem in perceived stigma and depression. According to Baron and Kenny (1985), before one can test for mediation, three criteria should fulfilled: 1) the predictor should be significantly related to the outcome, 2) the predictor should be related to the mediator, and 3) the mediator should be related to the outcome. I used three separate multiple regression analyses to test these relationships, including the control variables indicated above. All three criteria were fulfilled, and a meditational analysis was conducted. In the first model, all variables except self-esteem were entered, yielding a significant relationship between perceived stigma and depression. In the second model, self-esteem was added and the correlation between stigma and depressive symptomatology was no longer significant, suggesting that self-esteem in this sample mediated the relationship between perceived weight-based stigma and depression.
Table 5. Relationship between Perceived Stigma and Depressive Symptomatology

<table>
<thead>
<tr>
<th></th>
<th>b</th>
<th>β</th>
<th>se</th>
<th>ΔR²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Esteem</td>
<td>1.26***</td>
<td>.51***</td>
<td>.19</td>
<td></td>
</tr>
<tr>
<td>Body-Mass Index (BMI)</td>
<td>.17</td>
<td>.10</td>
<td>.14</td>
<td></td>
</tr>
<tr>
<td>Percentage of overweight family</td>
<td>-.06</td>
<td>-.16</td>
<td>.03</td>
<td></td>
</tr>
<tr>
<td>Percentage of overweight friends</td>
<td>.05</td>
<td>.09</td>
<td>.04</td>
<td></td>
</tr>
<tr>
<td>Perceived Stigma</td>
<td>.00</td>
<td>.00</td>
<td>.13</td>
<td>0.00</td>
</tr>
</tbody>
</table>

*** p<.001

Table 6. Relationship between Perceived Stigma and Eating Behaviors

<table>
<thead>
<tr>
<th></th>
<th>b</th>
<th>β</th>
<th>se</th>
<th>ΔR²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Esteem</td>
<td>-.03</td>
<td>-.02</td>
<td>.11</td>
<td></td>
</tr>
<tr>
<td>BMI</td>
<td>.01</td>
<td>.01</td>
<td>.08</td>
<td></td>
</tr>
<tr>
<td>Percentage of overweight family</td>
<td>.01</td>
<td>.06</td>
<td>.02</td>
<td></td>
</tr>
<tr>
<td>Percentage of overweight friends</td>
<td>.00</td>
<td>.00</td>
<td>.03</td>
<td></td>
</tr>
<tr>
<td>Perceived Stigma</td>
<td>-.02</td>
<td>-.02</td>
<td>.07</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Table 7. Relationship between Perceived Stigma and Exercise Behaviors

<table>
<thead>
<tr>
<th></th>
<th>b</th>
<th>β</th>
<th>se</th>
<th>ΔR²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self-Esteem</td>
<td>-.04</td>
<td>-.16</td>
<td>.02</td>
<td></td>
</tr>
<tr>
<td>BMI</td>
<td>-.02</td>
<td>-.12</td>
<td>.02</td>
<td></td>
</tr>
<tr>
<td>Percentage of overweight family</td>
<td>.00</td>
<td>.03</td>
<td>.01</td>
<td></td>
</tr>
<tr>
<td>Percentage of overweight friends</td>
<td>-.01</td>
<td>-.22</td>
<td>.01</td>
<td></td>
</tr>
<tr>
<td>Perceived Stigma</td>
<td>.03</td>
<td>.20</td>
<td>.02</td>
<td>0.03</td>
</tr>
</tbody>
</table>

Note: ΔR² represents the change from a base model, which included only control variables.
(see Figure 5). A Sobel test was conducted and confirmed that perceived stigma was related to depressive symptomatology through self-esteem ($z = 4.28, p<.001$).

Furthermore, due to the null findings regarding perceived stigma and mental and physical health outcomes, post-hoc analyses were conducted to see if one weight category was responsible for the non-findings. A similar model to Hypothesis 1 was conducted examining the relationship between perceived stigma and exercise behavior. Using the same controls (except BMI), a separate multiple regression analysis was conducted for each of three weight categories: normal-weight, overweight, and obese (see methods for details). There were not enough underweight individuals to conduct an analysis for this group. Results indicated that perceived stigma was unrelated to exercise behaviors for overweight ($b = -.01, se = .05, p>.05$) and obese ($b = .00, se = .03 p>.05$) individuals. However, among normal-weight individuals, perceived stigma had a positive relationship with exercise behavior, such that higher reported stigma was associated with more calories burned in a week ($b = .05, se = .02, p<.05$).

Similar analyses were conducted with eating behaviors as the outcome variable. Perceived stigma did not predict eating behaviors for normal-weight individuals ($b = -.07 se = .10$), overweight individuals ($b = -.08, se = .13$), or obese individuals ($b = -.02, se = .16$). Finally, the same analyses were conducted with depressive symptomatology as the outcome variable. Perceived stigma did not predict depressive symptomatology for normal-weight individuals ($b = .02, se = .06$), overweight individuals ($b = -.20, se = .32$), or obese individuals ($b = -.24, se = .31$).
Figure 5. Self-esteem as a mediator between stigma and depressive symptoms.
**Hypothesis 2: Social Support as a Buffer**

To determine whether emotional social support from family and friends buffered the deleterious effects of perceived stigma on mental and physical health, multiple linear regressions were again utilized. Separate analyses were conducted for family and friends, similar to Hypothesis 1, with mental and physical health outcomes assessed separately. In addition to perceived stigma and control variables, two interaction terms were created: emotional social support from family x perceived stigma, and emotional support from friends x perceived stigma. Because of sample size issues, the interaction term for family support and the interaction term for friend support were analyzed in separate regression models. All interactions were created by first centering the main effect variables and then multiplying the centered perceived stigma variable and the respective centered support variable.

Hypothesis 2a examined the interaction between family/friend emotional support and stigma on depressive symptomatology. Contrary to predictions, multiple regression analyses revealed no interaction between emotional support from family and perceived stigma on depressive symptomatology (see Table 8).

Regression analyses, however, did reveal an interaction between emotional support from friends and perceived stigma on depressive symptomatology ($b = -.08$, $se = .03$, $p < .01$; see Table 9).

In order to further decompose these findings, a graphical representation was created. Tertiles determined the values for low and high levels of emotional social support from friends, with the upper third of emotional support values being classified as
Table 8. *Moderating Effects of Emotional Support from Family in the Relationship between Perceived Stigma and Depressive Symptomatology*

<table>
<thead>
<tr>
<th></th>
<th>$b$</th>
<th>β</th>
<th>se</th>
<th>Δ$R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor Self-Esteem</td>
<td>1.18***</td>
<td>.47***</td>
<td>.20</td>
<td></td>
</tr>
<tr>
<td>BMI</td>
<td>.17</td>
<td>.10</td>
<td>.14</td>
<td></td>
</tr>
<tr>
<td>Percentage of overweight family</td>
<td>-.06</td>
<td>-.15</td>
<td>.03</td>
<td></td>
</tr>
<tr>
<td>Percentage of overweight friends</td>
<td>.04</td>
<td>.08</td>
<td>.04</td>
<td></td>
</tr>
<tr>
<td>Perceived Stigma</td>
<td>-.01</td>
<td>-.01</td>
<td>.13</td>
<td></td>
</tr>
<tr>
<td>Emotional Support (Family)</td>
<td>-.29</td>
<td>-.10</td>
<td>.21</td>
<td></td>
</tr>
<tr>
<td>PS X ESS (Family)</td>
<td>.03</td>
<td>.06</td>
<td>.03</td>
<td>.00</td>
</tr>
</tbody>
</table>

***p<.001

Table 9. *Moderating Effects of Emotional Support from Friends in the Relationship between Perceived Stigma and Depressive Symptomatology*

<table>
<thead>
<tr>
<th></th>
<th>$b$</th>
<th>β</th>
<th>se</th>
<th>Δ$R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor Self-Esteem</td>
<td>1.27***</td>
<td>.51***</td>
<td>.19</td>
<td></td>
</tr>
<tr>
<td>BMI</td>
<td>.18</td>
<td>.10</td>
<td>.14</td>
<td></td>
</tr>
<tr>
<td>Percentage of overweight family</td>
<td>-.06*</td>
<td>-.16*</td>
<td>.03</td>
<td></td>
</tr>
<tr>
<td>Percentage of overweight friends</td>
<td>.05</td>
<td>.09</td>
<td>.04</td>
<td></td>
</tr>
<tr>
<td>Perceived Stigma</td>
<td>-.05</td>
<td>-.03</td>
<td>.13</td>
<td></td>
</tr>
<tr>
<td>Emotional Support (Friends)</td>
<td>.01</td>
<td>.00</td>
<td>.19</td>
<td></td>
</tr>
<tr>
<td>PS X ESS (Friends)</td>
<td>-.08**</td>
<td>-.21**</td>
<td>.03</td>
<td>.04</td>
</tr>
</tbody>
</table>

*p<.05, **p<.01, ***p<.001
high levels of social support and the lower third of emotional support values being
classified as low social support. Similarly, tertiles determined the cut-off points for low
and high levels of perceived stigma, with the upper third representing high levels of
perceived stigma and the lower third representing low levels of perceived stigma. As
shown in Figure 6, high levels of emotional support from friends appear to buffer
individuals who are experiencing high levels of perceived weight-based stigma.

Next, Hypothesis 2b concerned the moderating effects of emotional support from
friends/family in the relationship between perceived stigma and eating behaviors. Results
indicated that there was no association between eating behaviors and the interaction term
of perceived stigma and emotional support from family \( (b=-0.01, se=0.02, p>0.05; \) see Table
10) or perceived stigma and emotional support from friends \( (b=-0.01, se=0.02, p>0.05; \) see
Table 11).

Finally, Hypothesis 2c concerned the moderating effects of emotional support
from family and friends in the relationship between perceived stigma and exercise
behaviors. Results indicated that there was no association between exercise behaviors
and the interaction term of perceived stigma and emotional support from family \( (b=0.01,
se=0.00, p>0.05; \) see Table 12) or perceived stigma and emotional support from friends
\( (b=0.01, se=0.00, p>0.05; \) see Table 13).
Figure 6. Emotional Support from friends as a buffer.

Table 10. Moderating Effects of Emotional Support from Family in the Relationship between Perceived Stigma and Eating Behaviors

<table>
<thead>
<tr>
<th></th>
<th>b</th>
<th>β</th>
<th>se</th>
<th>ΔR²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor Self-Esteem</td>
<td>.04</td>
<td>.04</td>
<td>.11</td>
<td></td>
</tr>
<tr>
<td>BMI</td>
<td>.01</td>
<td>.01</td>
<td>.08</td>
<td></td>
</tr>
<tr>
<td>Percentage of overweight family</td>
<td>.01</td>
<td>.05</td>
<td>.02</td>
<td></td>
</tr>
<tr>
<td>Percentage of overweight friends</td>
<td>.01</td>
<td>.02</td>
<td>.02</td>
<td></td>
</tr>
<tr>
<td>Perceived Stigma</td>
<td>-.02</td>
<td>-.03</td>
<td>.07</td>
<td></td>
</tr>
<tr>
<td>Emotional Support (Family)</td>
<td>.27*</td>
<td>.19*</td>
<td>.12</td>
<td></td>
</tr>
<tr>
<td>PS X ESS (Family)</td>
<td>-.01</td>
<td>-.03</td>
<td>.02</td>
<td>.00</td>
</tr>
</tbody>
</table>

*p<.05
### Table 11. Moderating Effects of Emotional Support from Friends in the Relationship between Perceived Stigma and Eating Behaviors

<table>
<thead>
<tr>
<th></th>
<th>$b$</th>
<th>$\beta$</th>
<th>se</th>
<th>$\Delta R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor Self-Esteem</td>
<td>-.02</td>
<td>-.02</td>
<td>.11</td>
<td></td>
</tr>
<tr>
<td>BMI</td>
<td>.00</td>
<td>.00</td>
<td>.08</td>
<td></td>
</tr>
<tr>
<td>Percentage of overweight family</td>
<td>.01</td>
<td>.06</td>
<td>.02</td>
<td></td>
</tr>
<tr>
<td>Percentage of overweight friends</td>
<td>.00</td>
<td>.01</td>
<td>.03</td>
<td></td>
</tr>
<tr>
<td>Perceived Stigma</td>
<td>-.02</td>
<td>.02</td>
<td>.08</td>
<td>.00</td>
</tr>
<tr>
<td>Emotional Support (Friends)</td>
<td>.06</td>
<td>.05</td>
<td>.11</td>
<td></td>
</tr>
<tr>
<td>PS X ESS (Friends)</td>
<td>-.01</td>
<td>-.04</td>
<td>.02</td>
<td></td>
</tr>
</tbody>
</table>

### Table 12. Moderating Effects of Emotional Support from Family in the Relationship between Perceived Stigma and Exercise Behaviors

<table>
<thead>
<tr>
<th></th>
<th>$b$</th>
<th>$\beta$</th>
<th>se</th>
<th>$\Delta R^2$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Poor Self-Esteem</td>
<td>-.03</td>
<td>-.13</td>
<td>.03</td>
<td></td>
</tr>
<tr>
<td>BMI</td>
<td>-.02</td>
<td>-.11</td>
<td>.02</td>
<td></td>
</tr>
<tr>
<td>Percentage of overweight family</td>
<td>.00</td>
<td>.03</td>
<td>.01</td>
<td></td>
</tr>
<tr>
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<td>-.22</td>
<td>.01</td>
<td></td>
</tr>
<tr>
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<td>.20</td>
<td>.02</td>
<td></td>
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<tr>
<td>Emotional Support (Family)</td>
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<td>.11</td>
<td>.03</td>
<td></td>
</tr>
<tr>
<td>PS X ESS (Family)</td>
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<td>.07</td>
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### Table 13. Moderating Effects of Emotional Support from Friends in the Relationship between Perceived Stigma and Exercise Behaviors

<table>
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<th>$b$</th>
<th>$\beta$</th>
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Hypothesis 3: Instrumental Support as a Mediator between Perceived Stigma and Health Behaviors

Hypothesis 3 addressed instrumental social support as a potential mediator in the relationship between perceived stigma and mental health and health behaviors. In order to test the mediational model, the data were analyzed using a structural path model. However, because of missing data in the exercise frequency variable, a separate model was conducted for exercise behavior.

Based on bivariate correlations with the major study variables, BMI, percentage of family members who are overweight, percentage of friends who were overweight, and self-esteem were included as exogenous variables and left initially free to affect all other variables. In the final model, significant paths were retained for 1) BMI with perceived stigma 2) self-esteem and perceived stigma and depressive symptomatology 3) percentage of family that is overweight and instrumental support from family and 4) percentage of friends who are overweight and perceived stigma. Additionally, percentage of family who are overweight and percentage of friends who were overweight were correlated, and BMI was correlated with both percentage of friends who were overweight and percentage of family who were overweight. Including these variables ensured that any initial inequalities among participants were accounted for by the model, which allowed for the assessment of unique effects of the main study variables. Although I retained the four covariates and the above paths in the final model, for ease of presentation, they are not shown in Figure 6, with the exception of self-esteem, based on the prior post hoc analyses which suggest an indirect effect through self-esteem.
Maximum likelihood (ML) estimation method was used, as the multivariate normality assumption was not violated. Only three women had missing data; missing data was excluded listwise. Based on the sample size recommendations by Bentler (2006), the present sample size ($N = 151$) is sufficient to test our proposed model including covariates with a 5.6:1 $N:q$ ratio (where $q$ represents the number of free parameter estimates) – the recommended ratio is between 5:1 and 10:1 (i.e., 5 to 10 cases for every parameter estimate). The $N:q$ ratio is considered a good assessment of power because it considers the complexity of model to be estimated, rather than simply the number of observed/measured variables in the model (Jackson, 2003). Finally, the model was properly overidentified with more known parameters than unknown parameters.

Due to sample size and power issues, I tested my hypothesized model as a structural path model, with the predictors, mediators, and outcomes all represented as observed variables. Additionally, direct pathways were added from stigma to depression and eating behaviors in order to determine whether mediation was complete or partial. Although the hypothesized model fit the data well, $\chi^2 (27, N = 151) = 24.27, p = .11, CFI = .97, SRMR = .05, RMSEA = .05 (CI = .00, .09)$, none of the individual pathways involved in the mediation analyses were significant, suggesting that instrumental support did not mediate the relationship between stigma and the outcome variables (see Figure 7). However, consistent with earlier posthoc analyses, self-esteem was a mediator of the relation between perceived stigma and depression.

As stated above, due to the large amounts of missing data associated with exercise behaviors, a separate model was evaluated with exercise behaviors as the sole outcome.
Figure 7. Mediational model for depressive symptomatology and eating behaviors
Fifty-six women (34%) had missing data, but based on the reduced sample size recommendations by Bentler (2006), the sample size \(N = 106\) is still sufficient to test our proposed model including covariates with a 5.3:1 \(N:q\). The model was properly overidentified, with more known parameters than unknown parameters.

Based on bivariate correlations with the major study variables, BMI, percentage of family members who are overweight, percentage of friends who were overweight, and self-esteem were included as exogenous variables and left initially free to affect all other variables. In the final model, significant paths were retained for 1) BMI with perceived stigma 2) percentage of family that is overweight and instrumental support from family and 3) percentage of friends who are overweight and perceived stigma. Additionally, percentage of family who are overweight and percentage of friends who were overweight were correlated, and BMI was correlated with both percentage of friends who were overweight and percentage of family who were overweight. Again, although we retained the covariates and the above paths in the final model, for ease of presentation, they are not shown in Figure 8.

Maximum likelihood (ML) estimation method was used, as the multivariate normality assumption was not violated. Similar to the previous analysis, due to sample size and power issues, I tested my hypothesized model as a structural path model, with the predictors, mediators, and outcomes all represented as observed variables. Additionally, a direct pathway was added from stigma to exercise behaviors in order to
determine whether mediation was complete or partial. The hypothesized model fit the data well, $\chi^2 (20, N = 106) = 23.03$, $p = .06$, $CFI = .93$, $SRMR = .06$, $RMSEA = .08$.

* $p < .05$

Figure 8. Mediational model for depressive symptomatology and eating behaviors.
(CI = .00, .12), and several individual pathways were significant (see Figure 8). Perceived stigma was significantly related to instrumental support from family and friends, and instrumental support from friends was significantly related to exercise behaviors. A Sobel test for mediation was conducted for instrumental support from friends, as it was the only mediator that was related to the outcome. In this test with the direct effects included, a marginal effect of instrumental support from friends as a mediator in the relationship between stigma and exercise behaviors was found (z=-1.8, p=.07).

**Hypothesis 4: Perceived Weight Controllability and Social Support**

Hypothesis 4 examined the relationship between family’s and friends’ perceived controllability of weight and social support from family friends. Structural equation modeling was used so that simultaneous testing of pathways could be employed. Based on bivariate correlations with the major study variables, percentage of family members who are overweight and self-esteem were included as exogenous variables and left initially free to affect all other variables. In the final model, significant paths were retained for 1) self-esteem and emotional support from family and 2) percentage of family that is overweight and perceived controllability of family. Additionally, a bidirectional pathway was added between perceived controllability-family and perceived controllability-friends. Again, although we retained the two covariates and the above paths in the final model, for ease of presentation, they are not shown in Figure 6.

Maximum likelihood (ML) estimation method was used, as the multivariate normality assumption was not violated. Only one woman had missing data; missing data was excluded listwise. Again, based on the sample size recommendations by Bentler
(2006), the present sample size ($N = 153$) is sufficient to test our proposed model including covariates with a 8.5:1 $N:q$ ratio. Finally, the model was properly overidentified, with more known parameters than unknown parameters.

The hypothesized model fit the data well, $\chi^2 (18, N = 153) = 37.77, p = .00, CFI = .92, SRMR = .09, RMSEA = .08 \ (CI = .05, .12)$. As shown in Figure 9, all but one of the pathways was highly significant. Family’s perception of weight controllability was a significant predictor of support from family, such that increases in controllability were related to increases in both instrumental and emotional support. Additionally, friends’ perception of weight controllability significantly predicted instrumental support from friends, such that increases in perceived controllability was related to increases in instrumental support.
Figure 9. Relationship between perceived controllability of weight and social support.
CHAPTER 4

DISCUSSION

This dissertation was designed to examine the impact of weight-based stigma on mental and physical health, identify the role of social support in the relationship between stigma and health, and determine the link between controllability of weight and the amount of social support provided. This dissertation extended previous research in several ways. First, although the correlation between weight-based stigma and mental health has been examined with obese populations, this dissertation was the first known study to examine the impact of weight-based stigma on mental and physical health in a predominantly normal-weight sample. Second, only one study, to date, has examined the role of emotional social support as a buffer in the relationship between weight-based stigma and health (Xie, Chou, Spruijt-Metz, Liu, Xia, & Gong, 2005), but they used social isolation as their measure of stigma and used a sample of overweight children. This dissertation improves upon this study by using a more direct measure of stigma and replicates the findings in a college-aged sample. Third, this dissertation was the first, to my knowledge, to examine instrumental social support as a mediator in the relationship between weight-based stigma mental and physical health. Finally, this dissertation extends the research of Seacat, Hirschman, and Mickelson (2007) and Weiner, Perry and Magnusson (1988), who examined the impact of controllability of stigma on hypothetical
support provided to the stigmatized. This dissertation focuses on the perspective of the stigmatized and the impact of perceived controllability of weight on reported support from family and friends. The remainder of the dissertation will address the findings of the study in detail and will address potential limitations as well as future directions stemming from this research.

**Stigma and Mental Health**

Contrary to Friedman and colleagues’ (2005) findings that weight-based stigma was correlated with depression, results from this dissertation indicated that weight-based perceived stigma was not related to depressive symptomatology. One potential explanation for these differences involves the samples being investigated. Friedman used an obese sample who were seeking treatment, while this dissertation included a majority of normal weight individuals. Further examination of the data revealed no differences between weight categories, such that there was no relationship between stigma and mental health for either normal-weight individuals or overweight individuals, implying that sample differences are not a likely reason for the differences between the two studies.

More likely, it is the presence of self-esteem as a control variable in the regression models. Although Friedman and colleagues did not control for self-esteem, elsewhere in their study they performed analyses examining the role of perceived stigma on self-esteem and found that stigmatization was negatively correlated with high self-esteem. Other research concurs that self-esteem may be related to stigma (Crocker and Garcia, 2005) and post-hoc analyses for this dissertation revealed that when self-esteem was
removed from the analysis, the relation of perceived stigma to depressive symptomatology became significant. This result suggests that self-esteem may be mediating the relationship between perceived stigma and depression. Further evidence supporting this argument is found in the SEM analyses which found that perceived weight-based stigma was indirectly related to depression through self-esteem ($z=4.27$, $p<.001$). Because the data is cross-sectional, it is also possible that the directionality of the relationship between stigma and self-esteem could be reversed. Rather than stigma having an impact on self-esteem, Miller and Downey (1999) found that high self-esteem was negatively correlated with self-perceived weight (but not actual weight). As actual weight was not correlated with self-esteem, this finding suggests that having low self-esteem may impact one’s perception of body weight and the stigma they experience. Future research should more closely examine the role of self-esteem in the stigma-health relationship, with an emphasis on longitudinal analyses, so directionality can be determined.

*Stigma and Physical Health*

This dissertation also examined the role of weight-based stigma on health behaviors. Very few studies have examined this relationship, and the focus has typically been centered on exercise behaviors. Faith and colleagues (2002) found that, among children, being victimized based on one’s weight was negatively associated with physical activity. Likewise, in Vartanian and Shaprow’s study (2008), college-aged women with weight-based stigma were more likely to avoid exercise.
Contrary to these studies, this dissertation found no relationship between perceived stigma and physical exercise. One may assume that the normal-weight individuals in the sample may be responsible for this non-relationship, so post-hoc analyses were conducted to examine differences between normal and overweight individuals. It was expected that overweight individuals would have a negative relationship between stigma and exercise behaviors. Interestingly, however, when the sample was divided into categories based on weight, there was no relationship between stigma and exercise behaviors for overweight individuals, but there was a correlation between stigma and exercise behaviors for normal weight individuals, such that weight-based stigma was positively related to exercise behaviors for normal-weight individuals.

Normal-weight individuals may struggle with a fear of being overweight (Shapiro, Newcomb, & Loeb, 1997), with stigma serving as a proxy variable for this fear. Coping with the “fear of fat” may include an increase in exercise as a way to relieve anxiety regarding gaining weight. In other words, it may be possible that the stigma they are experiencing is driving them to exercise more. Alternately, they may be over-reporting exercise for fear of being evaluated negatively and, consequently, fulfilling stereotypes. In other words, the awareness that others may be assuming they do not lead healthy lifestyles may make them feel embarrassed and have a desire to compensate for their perceived flaw and over-report socially desirable behaviors (Motl, McAuley & DiStefano, 2005).

An explanation for the null findings for overweight individuals may lie in stereotype threat research. Researchers posit that individuals experiencing stigma may
become hyper-aware of other’s stereotypes regarding their stigmatized condition (Allport, 1954) and upon reminders of their stigmatized condition, they may become defensive and feel afraid of fulfilling stereotypes placed upon them (Steele & Aronson, 1995). As a result, despite their desire to avoid fulfilling stereotypes, they often underperform and fulfill the stereotypes (Steele & Aronson, 1995). Within the context of overweight individuals, although some may respond by increasing exercise (similar to normal-weight individuals), many others may actually exercise less because of stereotype threat. Consequently, these two conflicting responses may cancel each other out, resulting in non-significant findings.

Beyond exercise behaviors, this dissertation was the first to examine the role of perceived stigma in eating behaviors. This dissertation found no relationship between stigma and eating behaviors. However, this finding should be viewed cautiously. First, the measure of eating behaviors, in an attempt to be efficient, was brief and susceptible to reporting error. Many participants may guess the amount of foods they eat incorrectly, as many people tend to underreport their food consumption, especially those who are overweight (Carels, Harper, & Konrad, 2006). Moreover, as with exercise, the measure is open to reporting bias, as many individuals will choose to report what is socially acceptable. Participants experiencing stigma are likely to be embarrassed about their food choices, and many may even be in denial regarding the amount of food they eat. It could also be that these food items do not necessarily correlate, and as such results in low reliability. For example, one may choose to avoid animal products and animal fats, but eat excessive amounts of vegetable oils. As a result, these findings should be replicated
with a larger, more comprehensive measure of food behaviors that reflects average caloric consumption in addition to frequency of food choices.

**Moderation of the Stigma-Health Relationship**

I also examined whether emotional social support from family and friends acted as a buffer in the relationship between perceived stigma and depressive symptomatology and perceived stigma and health-compromising/enhancing behaviors. Results showed that emotional support from friends (but not family) buffered the relationship of stigma and mental health. These results are consistent with Xie and colleagues (2005), who found that availability of support, in general, buffered the harmful effects of weight stigma on depressive symptomatology. My dissertation expanded on these findings by specifying the source of support. Findings from this study suggested that support from friends may be more effective in battling depressive symptoms than family support.

This reliance on friends may reflect the need for college-aged women to shift their desire for support from family-of origin to support from friends and significant others. Friends in a college setting oftentimes are more proximal than family, and individuals may have the opportunity to see their friends on a daily basis. Having friends consistently available and aware of everyday stressors may foster self-disclosure and intimacy in the relationship. As a result, college-aged individuals may rely on friends initially out of convenience. Additionally, they may rely on friends irregardless of proximal constraints. As the adage says: “You can choose your friends, but not your family.” Hence, support from friends more often feels voluntarily given, while support from family can feel obligatory. Furthermore, one often chooses friends with similar values and
complementary personality styles. As a result, support from friends may be a better match, whereas familial support may include judgment or evaluation of the loved one’s choices, decisions, or lifestyle. This result is important because it speaks to the need for further research on support sources rather than examining social support in general.

As for eating and exercise behaviors, there was no interaction between stigma and emotional support on physical health behaviors. First, it may be that emotional support is more beneficial for mental health than for physical health. For example, one study found that in a sample of breast-cancer patients, emotional social support was related to mental well-being, but was not at all correlated with physical well-being (Bloom, Stewart, Johnston, Banks, & Fobair, 2001). However, there may be another reason for the null results. These non-findings may be due to two conflicting processes underlying the provision of social support (and the consequent perception of social support received). Some friends and family may choose to cope (and help their loved one cope) through adopting a healthy lifestyle, while others may actually encourage lack of exercise and consumption of unhealthy foods. Oftentimes, one may turn to comforting foods that elicit positive memories associated with these foods as a way of managing negative emotions. Thus, if both of these coping responses are going on within the sample, then the effects will not be visible. Future studies need to more systematically examine the intertwining and complex roles of emotional and instrumental support in the relation of perceived weight stigma and health.
Mediation of the Stigma Health Relationship

This dissertation was the first to examine instrumental social support as a mediator in the stigma-physical health relationship. The expectation was that perceived stigma would trigger less instrumental support from friends and family that would, in turn, result in less frequent participation in health-promoting behaviors and depression. Meditational analyses did not find evidence that instrumental social support mediates the relationship between stigma and health. This lack of a finding may suggest that stigma does not enact instrumental social support, or that instrumental support does not impact mental health. If this is the case, then interventions should focus on emotional support. Potentially, instrumental support may feel burdensome to some overweight individuals and may even be perceived as negative. Research supports this theory. Deelstra and colleagues (2003) found that support which felt imposed elicited negative responses. Alternately, the measure of instrumental support could also account for the null results. The instrumental social support measures had unacceptable alpha coefficients (.53 and .54 respectively), likely due to the personal preferences of friends and family members. In other words, the items may not naturally correlate with one another as family members may be happy to assist with eating behaviors, but may not be interested in exercise. One way to examine the meditational nature of instrumental support would be to measure support that is less likely to vary with personal history and values. Giving advice, driving someone to a weight-loss center, or providing information about eating and exercise are all forms of instrumental support that may be less affected by personal preference. Future
studies should use a more reliable, cohesive measure of instrumental support and reexamine this potential mediation model.

**The Impact of Controllability on Social Support**

Previous research suggests that when people view a stigma as controllable, they show less pity and offer less assistance (Seacat, Hirschman, & Mickelson, 2007; Weiner, Perry & Magnusson, 1988). In previous research, participants were given hypothetical scenarios and asked how they would feel about the person in question should they be found responsible for their condition. However, no one to date has examined whether these findings would generalize to loved ones. Puhl and Brownell (2006) and Kinston, Loader and Miller (1988) found that weight bias and negative attitudes about weight were prevalent among family. Consequently, if family is susceptible to weight bias, they are also likely to subscribe to existing social norms and blame their loved ones for their condition.

This dissertation was the first to examine the impact of perceived controllability on social support from family and friends. Results from this dissertation were in direct contrast to hypotheses. Family’s perceived controllability of weight was related to greater reported emotional and instrumental support from family, and friends’ perceived controllability of weight was related to greater reported instrumental support from friends. These findings indicate that family and friends do not behave towards their loved ones as they would towards strangers. Although they may experience negative cognitions about weight, it does not appear to color their feelings about their loved ones. In the case of instrumental support, their perceptions of controllability led to greater efforts to help
the participant to live a healthy lifestyle. If they feel weight is controllable, they may have confidence in health-promoting behaviors and will be more likely to participate in and encourage these behaviors. As for emotional support, it may be that family/friends feel more pity for loved ones struggling with weight concerns, as they see the potential damage stigma is imposing on loved ones. In other words, they seek to comfort and encourage family/friends who are experiencing weight-based stigma. Further, if they know weight is controllable, they likely have a grasp on the difficulties of maintaining a healthy weight and offer more support as a result. Post-hoc analyses do not support this theory though. If it were the case that perceived stigma triggered more pity and support from family members who believed that stigma was controllable, than we should find an interaction effect between stigma and controllability on support. In other words, individuals with high levels of perceived weight stigma and family members and friends who believe weight is controllable may receive more support than others. Examination of the data, however, did not reveal an interaction between stigma and controllability on support reported.

Another explanation may be that a third variable, that of friends and family’s locus of control, may be impacting both their perceptions of weight controllability and support provided. On the one hand, if one feels efficacious about life in general (locus of control), they are likely to extend that into specific domains, such as weight controllability. Additionally, having an internal locus of control results in better mental health, and thereby, more energy and motivation to provide support. As a result, the support providers will convey messages of controllability to their loved ones, both by
acting more supportive, and offering support that implies controllability (e.g. weight-loss aids, increasing exercise). On the other hand, friends/family who believe they are not able to control their lives (and consequently feel weight is uncontrollable), may have a sense of learned helplessness and experience depressive symptoms which may result in lower support provision. (Iida, Seidman, Shrout, Fujita, & Bolger, 2008). Loved ones will then report less support and will receive messages that imply their loved one feels weight is uncontrollable. Hence, future studies should evaluate friends’/families’ locus of control in studies examining weight, stigma, and support provision.

**Limitations**

There are several limitations inherent within this study. First and foremost, the cross-sectional design prevents any causational or directional conclusions from being drawn. While it is possible that stigma is impacting mental health through the mechanism of self-esteem, it is also quite possible that self-esteem impacts weight-based stigma (Crocker & Garcia, 2005). Furthermore, findings concerning controllability of weight and social support must be viewed with caution as some third variable explanations have not yet been ruled out. It is likely that perceptions of weight controllability result in greater levels of emotional social support, but it is also possible that something like locus of control is responsible for both perceptions of weight controllability and social support. Future longitudinal studies are needed in order to parse out the temporal ordering of these variables.

The second major limitation within this study involves the measurement of health-promoting/compromising behaviors. The Paffenbarger Physical Activity
Questionnaire (PPAQ), although well-validated, was difficult for many participants to understand and accurately respond to the items. Over 30% of the data were too ambiguous to include in analyses, as many did not give detailed information that would enable the exercise to be classified as “light” or “vigorous” exercise. As a result, the analyses involving the PPAQ, were greatly limited in sample size, and likely high in error. Although the problems with this measure may cast doubts on the non-significant results (i.e. a Type II error may have been made), it gives increased confidence to the significant findings - despite the error and low sample size, there was a positive relationship between weight-based stigma and physical exercise. Hence, it may be that with a more accurate measure of exercise behaviors, I may have found stronger correlations and effect sizes. Future studies should consider an interview format to alleviate reporting inaccuracies.

**Future Directions**

This dissertation reveals several new avenues of research that should be explored. One interesting suggestion coming from this data is the possibility that self-esteem may be mediating the relationship between perceived weight-based stigma and depressive symptomatology. Previous research has revealed relationships between perceived stigma and self-esteem (Crocker & Garcia, 2005) and self-esteem and depressive symptomatology (Xue & Li, 2007). Combined with the results of this study, it is quite likely that future studies would reveal that self-esteem may act as a mediator. However, as Miller and Downey (1999) suggest, self-esteem may be influencing decisions about whether one is overweight, and it is possible that low self-esteem leads to greater
perceptions of weight-based stigma. Future longitudinal studies are needed to identify the temporal ordering of these variables.

Another fruitful avenue of research centers around the positive relationship between stigma and exercise behaviors. Efforts should be made to flesh out this relationship. Does stigma actually lead to more exercise behavior, or an over-reporting of exercise behavior for normal weight, but stigmatized, individuals? Future studies should measure and address the role of stigma consciousness and stereotype threat on reporting behaviors among normal-weight individuals, as well as actual exercise and eating behaviors.

Finally, in light of the results concerning controllability of weight and social support, several new avenues of research emerge. First, why is it that perceived controllability leads to greater support from family and friends? Future research should assess family/friend history with weight loss/management, as well as locus of control. Family/friends with prior dieting history are likely to offer more emotional and instrumental support, as they can truly empathize with their loved one. If this is the case, treatments and interventions should focus on including family/friends in weight management processes so that they can experience weight management for themselves and have more insight for their loved ones. Additionally, empirical support regarding family and friends experiences with weight management would give increased credibility to the practice of using support groups, who may have more empathy and will be better at giving appropriate emotional and instrumental support. On the other hand, it may also be that a global locus of control is influencing both perceptions of control and social...
support. In this case, interventions should focus on developing skills that increase a sense of internal locus of control for the overweight individual and their social network.

Finally, family/friends’ controllability, as measured here, was from the overweight individual’s perspective. In some ways, this focus on the overweight’s perspective is a strength of the study; we are more influenced by our perceptions of others’ feelings than their actual feelings (Cooley, 1902; Oikawa & Yoshida, 2007). Hence, if we are concerned with outcomes relevant to the stigmatized, perceptions from the stigmatized are most valuable. However, if we want to address or understand stigma from the perpetrator’s perspective, we should be more aware of their perspective. Future studies should replicate the findings in this dissertation using the perspective of friends/family with the expectation that people will be more likely to offer support for loved ones if the stigma is controllable.

Conclusions

This dissertation has made several important contributions to the literature. First, this study did not find that perceived stigma was related to depressive symptomatology, due to the presence of self-esteem in the model. Hence, this study suggests that self-esteem is an important variable to assess in weight-based stigma research, and may be partially responsible for the deleterious effects of stigma on mental health. Second, this dissertation was among the first studies to examine the direct link between weight-based stigma and physical health, and findings suggests that participants either compensate for perceived stigma through increased exercise, or feel pressure (potentially because of stereotype threat) to report greater levels of exercise. Third, this dissertation was the first
to examine the interaction between stigma and support among college-aged women, and found that emotional support from friends acted as a buffer. Those experiencing high levels of stigma, and reporting high levels of support, experienced fewer depressive symptoms than those with high levels of stigma and low support. Finally, this dissertation was the first to examine the correlation between family and friends’ perceptions of weight controllability and reported social support. While the expectation was that findings would replicate previous studies examining stranger/acquaintance perceptions of controllability, findings indicated that, for family and friends, perception of weight controllability led to higher levels of social support. This finding suggests that personal relationships may be less affected by social norms regarding weight, and those involved in an individual’s life may be motivated to offer more support and help if they feel that weight is within one’s control. In sum, despite the prevalence of weight-based stigma and its deleterious effects on health, social support may be an effective way to manage this stressor. Future research should look to family and friends and ways to increase their knowledge and ability concerning support and weight-management. In conclusion, the increasing focus on weight in our society is impacting feelings of shame and stigma, even in normal weight individuals, and the potentially dangerous consequences on mental and physical health are apparent. Friends and family can help individuals in dealing with these issues; however, more research is needed to fully understand the complex and sometimes contradictory behaviors that play out in these relationships.
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CONSENT FORM

**Project Title:** College Women’s Experiences  
**Investigators:** Melanie A. Tabak, M.A. & Kristin D. Mickelson, Ph.D.

**INTRODUCTION & PARTICIPATION:** You are being asked to participate as one of approximately 150 participants in a research study examining social support and stigma. If you decide to take part in this experiment, we will be asking you to fill out a variety of questionnaires designed to measure your thoughts, feelings, and reactions to various stressful life events.

**BENEFITS:** Other than class credit (1 pt), you personally may not receive any direct benefits from your participation in this study. Your participation in this study may enable us to help future individuals dealing with stigma in their lives.

**RISKS:** Some of the questions we ask may require you to remember stressful life events, and this memory may lead to increases in distress. The long-term effects of discussing your memories are unknown, but it is possible that some of the questions may provoke stressful memories. In addition, as the long-term effects of discussing stressful memories are unknown, participating in the present study may have no effects on your levels of distress, may lead to longer-lasting distress, or may reduce your levels of distress. If any part of the study causes you to become distressed (symptoms of distress and/or depression include sleep disruption, concentration problems, changes in appetite, and similar disruptions in functioning) please call Dr. Kristin Mickelson at (330) 672-2253 for a referral during office hours. Additionally, for KSU students, services from the Psychological Clinic are free. The clinic can be reached at (330) 672-2372.

**CONFIDENTIALITY:** All data in this study will be kept strictly confidential within the limits of the law. Confidentiality may not be maintained if you indicate that you may harm others or yourself, or do/have done harm to others. The information you provide us with will be identified only by a subject number, and will be examined only by Melanie Tabak and qualified members of her research team. The only copies of the data will remain in a locked file. After the study, the data will be published in scientific journals, but data will not be published in any manner that can identify you.

**VOLUNTARY PARTICIPATION:** Your participation in this study is voluntary and you may decline to participate in it without loss of any future services or benefits to which you may be entitled. Should you choose to participate, you may voluntarily withdraw from it at any time. By signing this form you are indicating that you have been informed about the research study in which you are agreeing to participate, and have had all of your questions satisfactorily answered. You will receive a copy of this form for your records.

**QUESTIONS:** If you have any questions now, during or following your participation regarding this study and its associated risks, please contact Kristin D. Mickelson at (330) 672-2253. This project has been approved by Kent State University. If you have questions about Kent State University’s rules for research, please call Jim West at (330) 672-2070.

**SIGNATURE LINES:** By signing this form I acknowledge that I have read it, and have had any questions regarding the risks and benefits of this study satisfactorily answered and I am voluntarily consenting to participate in this study. Further, I realize that by signing this form I do not waive any of my legal rights, and I can choose to terminate my participation at any time.

Date:_____________

Participant Signature: ______________________________________________________
APPENDIX B

DEBRIEFING
College Women’s Experiences

Now that you’ve completed the study, we would like to tell you what the study is about. The purpose of this study is to determine the impact of perceptions of weight controllability on social support. In other words, do people receive less social support if their family and friends think weight is controllable? This study examined these issues through information you provided. Please do not discuss the details of this study with others until after the study is completed at the end of Fall 2008 semester. This confidentiality is important because we are looking for responses that are unbiased, and not influenced by opinions of others.

If you have experienced any distress as a result of participating in this study, please contact Kristin D. Mickelson at (330) 672-2253. Additionally, as a KSU student, you have free psychological services available to you at the Psychological Clinic. You can reach the clinic at (330)672-2372.

If you have any other questions regarding the study, please feel free to ask them of us now.

Thank you for your participation!
APPENDIX C

STUDY MEASURES
DEMOGRAPHICS

1) Sex: __________________ Male  __________________Female

2) Which do you feel best describes your race/ethnicity?

________________ White
________________ Black/African American
________________ Hispanic
________________ Native American
________________ Asian
________________ Other (Specify) _______________________________________

3) What is your age? _______________ (in years)

4) What year in college are you? (Please select only one)

_______ Freshman  _________ Sophomore ________ Junior

_______ Senior  _________ Post-Graduate

5) What is your marital status?

_______ Married/Cohabitating  _________ Divorced

_______ Single

If single, do you have a significant other? _________ Yes  _________ No

If yes, how long have you been with your significant other? _______________________

6) What is your height? ________________

7) How much do you weigh? ______________

8) Do you believe that you were overweight as a child?___________ (yes/no)

________________ as an adolescent? ______________ (yes/no)
Family/Friends
(Percentage who are overweight)

From 0-100%, overall, how many of your **immediate family members** (i.e. parents, grandparents, and siblings) are overweight with 0% representing no family members and 100% representing all family members? (circle one answer)

0%  10%  20%  30%  40%  50%  60%  70%  80%  90%  100%

None of my family is overweight

All of my family is overweight

From 0-100%, overall, how many of your **friends** are overweight with 0% representing no friends and 100% representing all friends? (circle one answer)

0%  10%  20%  30%  40%  50%  60%  70%  80%  90%  100%

None of my family is overweight

All of my family is overweight
Rosenberg Self-Esteem Scale

Below are some statements with which you may agree or disagree. Use the scale below to show your agreement with each item. Place the letter on line for that item. Please be open and honest in your answers.

A= Strongly Agree B= Agree C= Disagree D= Strongly Disagree

______ 1. On the whole, I am satisfied with myself.
______ 2. At times I think I am no good at all.
______ 3. I feel that I have a number of good qualities.
______ 4. I am able to do things as well as most other people.
______ 5. I feel I do not much to be proud of.
______ 6. I certainly feel useless at times.
______ 7. I feel that I’m a person of worth, at least on an equal plane with others.
______ 8. All in all, I am inclined to feel that I am a failure.
______ 9. I take a positive attitude toward myself.
Revised Perceived Stigma Scale

1 = Definitely Disagree
2 = Somewhat Disagree
3 = Neither Agree nor Disagree
4 = Somewhat Agree
5 = Definitely Agree

6a. ________ I feel that I am odd or abnormal because of my weight
6b. ________ There have been times when I have felt ashamed because of my weight.
6c. ________ I never feel self-conscious about my weight.
6d. ________ People treat me differently because of my weight.
6e. ________ I never feel embarrassed about my weight.
6f. ________ I feel that others look down on me because of my weight.
6g. ________ I have found that people say negative or unkind things about me behind my back because of my weight.
6h. ________ I have been excluded from school and/or family functions because of my weight.
Emotional Social Support
(adapted from Blumenthal et al., 1987)

1 = very strongly disagree
2 = strongly disagree
3 = somewhat disagree
4 = neither agree nor disagree
5 = somewhat agree
6 = strongly agree
7 = very strongly agree

1) My family really tries to help me.
2) My family is willing to help me make decisions.
3) I get the emotional help and support I need from my family.
4) I can talk about my problems with my family.
5) My friends really try to help me.
6) My friends are willing to help me make decisions.
7) I get the emotional help and support I need from my friends.
8) I can talk about my problems with my friends.
Instrumental Social Support
(adapted from Nothwehr, 2004)

Using the following scale, please answer the questions below:

1 = never
2 = rarely
3 = sometimes
4 = often
5 = very often

1) How often does your family offer to eat healthy foods with you?
2) How often does your family offer to exercise with you?
3) How often does your family try to dissuade you from working out or exercising?
4) How often does your family eat unhealthy foods in front of you or try to tempt you with unhealthy foods?
5) How often do your friends offer to eat healthy foods with you?
6) How often do your friends offer to exercise with you?
7) How often do your friends try to dissuade you from working out or exercising?
8) How often do your friends eat unhealthy foods in front of you or try to tempt you with unhealthy foods?
Perceptions of Weight Controllability

1) From 0-100%, overall, how much does your family think your body weight is something that can be controlled by you (i.e. you should be able to lose weight if you wanted to) with 0 % being completely uncontrollable and 100% being completely controllable? (circle one answer)

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<tr>
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2) From 0-100%, overall, how much do your friends think your body weight is something that can be controlled by you (i.e. you should be able to lose weight if you wanted to) with 0 % being completely uncontrollable and 100% being completely controllable? (circle one answer)

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</table>

3) From 0-100%, overall, how much do you think your body weight is something that can be controlled by you (i.e. you should be able to lose weight if you wanted to) with 0 % being completely uncontrollable and 100% being completely controllable? (circle one answer)

<table>
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<tr>
<th>0%</th>
<th>10%</th>
<th>20%</th>
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**CES-D (Radloff, 1977)**

Below is a list of the ways that you might have felt or behaved in general during the last week. Please indicate how often you have felt each of these ways in the last 7 days.

- 0 = Rarely or none of the time (less than 1 day)
- 1 = Some or a little of the time (1-2 days)
- 2 = Occasionally or a moderate amount of time (3-4 days)
- 3 = Most or all of the time (5-7 days)

<table>
<thead>
<tr>
<th>During the Past Week:</th>
<th>None/ Rarely</th>
<th>A little</th>
<th>Moderate</th>
<th>Most</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. I was bothered by things that don’t usually bother me.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>2. I did not feel like eating; my appetite was poor.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>3. I felt like I could not shake off the blues, even with help from friends/family</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>4. I felt that I was just as good as other people.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>5. I had trouble keeping my mind on what I was doing.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>6. I felt depressed.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<tr>
<td>7. I felt that everything I did was an effort.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<tr>
<td>8. I felt hopeful about the future.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<tr>
<td>9. I thought my life had been a failure.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<tr>
<td>10. I felt fearful.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<tr>
<td>11. My sleep was restless.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<td>12. I was happy.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<td>13. I talked less than usual.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<td>14. I felt lonely.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<tr>
<td>15. People were unfriendly.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<tr>
<td>16. I enjoyed life.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>17. I had crying spells.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<tr>
<td>18. I felt sad.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
</tr>
<tr>
<td>19. I felt that people disliked me.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
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<tr>
<td>20. I could not get “going.”</td>
<td>0</td>
<td>1</td>
<td>2</td>
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FFQ- Short (adapted from the Food Frequency Questionnaire; Osler & Heitmann, 1996)

Using the rating scale below, please indicate how often you consume the following foods?

1 = never  
2 = once a month or less  
3 = a couple of times a month

4 = once a week  
5 = a couple of times a week  
6 = once a day

7 = a couple of times a day or more

Animal fats'______________  
Cooked oatmeal______________

Ice cream, soda_____________  
Vegetable margarine_____________

Cake, biscuits_______________  
Candy, chocolate______________

Jam, honey_______________  
Potatoes______________

Rice_________________  
Pasta________________

Low-fat margarine_________  
White ryebread____________

Cheese_________________  
Dark ryebread____________

Milk, yogurt_____________  
Light bread______________

Meat_________________  
Coarse bread____________

Sausages______________

Eggs__________________

Fish__________________

Fruit__________________

Juice__________________

Vegetables______________
Paffenbarger Physical Activity Questionnaire

Name _______________________ Date ________________

PLEASE ANSWER THE FOLLOWING QUESTIONS BASED ON YOUR AVERAGE DAILY PHYSICAL ACTIVITY HABITS FOR THE PAST YEAR

1. How many stairs did you climb up on an average day during the past year? 
   __________ stairs per day (1 flight or floor=10 stairs)

2. How many city blocks or their equivalent did you walk on an average day during the past year? 
   ____________ blocks per day (12 blocks = 1 mile)

3. List any sports, leisure, or recreational activities you have participated in on a regular basis during the past year. Enter the average number of times per week you took part in these activities and the average duration of these sessions. Include only time you were physically active (that is, actual playing or activity time).

Sport or Times per Time per Episode

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<tr>
<th>Recreation</th>
<th>Week</th>
<th>Hours</th>
<th>Minutes</th>
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