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The Relationship Between Young Women's Self-Perceived Body-Esteems and Calculated Body Compositions

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by

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DEDICATIONS

This thesis is dedicated to every person, male or female, who has dealt with body-esteem issues. I thank my Lord and Savior for revealing my passion in the field of dietetics to me and for providing me with the strength to finish this research project.

"I can do all things through Him who strengthens me."

Philippians 4:13.

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ABSTRACT

The Relationship between Young Women's Self-Perceived Body-Esteems and Calculated Body Compositions

Beginning at an early age, girls realize self-conscious feelings after being confronted with the issue of accepting their changing bodies (Halpern, Udry, Campbell & Suchindran, 1999). In the university setting, young women's self-perceptions of body-esteem are sensitive to outside influences and peers (Heinberg & Thompson, 1992; Giles, Helme & Krcmar, 2007, Shomaker & Furman, 2007). This study observes the relationship between calculated body compositions and self-perceived body-esteems among female students at the University of Mississippi. Eighty-five female students between the ages of 18 and 23 volunteered to participate in the study. A questionnaire assessed body-esteem levels of the participants and the BOD POD *Gold Standard* body composition tracking machine measured body fat percentages. Percent body fat ranged from 13.8% to 49.8% with a mean of 27.48% and a standard deviation of 6.37%. Percent body fat negatively correlated with the body esteem subscales Appearance (r = -0.323), Weight (r = -0.528) and Attribution (r = -0.212). Results of this study reveal that there is an inverse relationship between calculated body fat percentages and body-esteems in particular subgroups. The results of this study are consistent with Sarwer, Wadden and Foster (1998) who found the same association, reporting that women's body dissatisfaction is positively related to percent body fat. Forrest and Stuhldreher (2007) also found the same inverse relationship for body-esteem and body mass indexes. Further research should study the link between self-perceptions and calculated body compositions in different populations and should evaluate whether characteristics other than body composition affect-body esteem levels.

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CLARRIFICATION OF ABBREVIATIONS/TERMINOLOGY

BEAPP Body-Esteem Appearance: measures subject's feelings about own appearance

BEWT Body-Esteem Weight: measures subject's own weight satisfaction

BEATT Body-Esteem Attribution: measures the evaluations attributed to one's own body and appearance; focuses on others' opinions of one's appearance

CHAPTER I

INTRODUCTION

Although both males and females may exhibit low self-esteem, significant research has shown that low body satisfaction is a characteristic found in more women than men (Lowery, Robinson, Befort, Blanks, Sollenberger, Nicpon & Huser, 2005; Kashubeck-West, Mintz & Weigold, 2005; Iqbal, Shahnawaz & Alam, 2006; Mendelson, White & Mendelson, 1996; Forrest & Stuhldreher, 2007; Thompson & Thompson, 1986; McKinley, 1998; Booth, 1990; McDonald & Thompson, 1992; Mendelson, Mendelson & White, 2001). Therefore, it is more common for women to use restrictive dieting attempts to lose weight; so common in fact that women may diet even if they are not considered overweight (Wharton, Adams & Hampl, 2008). From the early ages when puberty begins, young girls are confronted with the issue of having to accept changes in their bodies, making girls self-conscious of their attractiveness (Halpern, Udry, Campbell & Suchindran, 1999).

Once young women enter a university setting, self-perceptions of body-esteem are sensitive to outside influences, and peers are especially influential (Heinberg & Thompson, 1992; Giles, Helme & Krcmar, 2007, Shomaker & Furman, 2007). Young women who value their physical appearances have high chances of desiring certain body sizes (Shomaker & Furman, 2007), and may engage in negative behaviors if they think their friends are accepting of similar actions (Giles, Helme & Krcmar, 2007). This peer influence is so strong that a young woman may develop a thin ideal from being surrounded by an appearance-conscious social group even if she was not previously dissatisfied with her body (Shomaker & Furman, 2007).

Studies have found that college-age women report less body dissatisfaction in comparison to other women they viewed as less attractive than themselves (Lin & Kulik, 2002; Jones & Buckingham, 2005). When associating race with body-esteem, college-age Caucasian women report more body dissatisfaction than their African-American or Asian-American counterparts despite body mass index levels (Akan & Grilo, 1995); furthermore, they express this dissatisfaction when below what is considered overweight while minority women express body dissatisfaction after being considered overweight (Fitzgibbon, Blackman & Avellone, 2000).

In the work force, women with high self-esteems are likely to believe in themselves and their abilities to perform well in challenging careers (Kammeyer-Mueller, Judge & Piccolo, 2008). These confident women are more likely to choose prestigious careers than self-conscious women who feel that they are not worthy of career success and achievement. Perhaps women feel secure in their jobs after receiving education, but high self-esteem may not always result in attaining higher education levels (Kammeyer-Mueller et al., 2008).

Since self-esteem positively affects dating relationship satisfaction (Arriaga, Slaughterbeck, Capezza & Hmurovic, 2007) and body-esteem and body distortion are positively related (Forrest & Stuhldreher, 2007), partners discover a mutual influence upon each other regarding many factors including self-esteem (Evans & Stukas, 2007). Two partners may exhibit differing self-esteems, but typically a relationship experience will be positive for the partner with more self-esteem (Sciangula & Morry, 2009). Finally, some women report that a relationship helps them feel more attractive and

confident; therefore, being in a relationship increases their self-esteem levels (Lin & Kulik, 2002; Forbes, Jobe & Richardson, 2006).

PURPOSE OF THE STUDY

The primary purpose of this study is to observe the relationship between calculated body compositions and self-perceived body-esteems among female students at the University of Mississippi. Young women and not young men are being studied, because it is speculated that there is a high percentage of female students at the University of Mississippi who struggle with self-esteem disorders. Also, it became apparent that more females than males were willing to volunteer to participate in the study. A review of published research demonstrated that there is no present data linking body-esteem and body compositions in college-aged individuals.

HYPOTHESES

The following null hypotheses were tested:

HO_1: There is no significant relationship between college-aged women with low BE-Appearance and high calculated body fat percentages.

HO_2: There is no significant relationship between college-aged women with low BE-Weight and high calculated body fat percentages.

HO_3: There is no significant relationship between college-aged women with low BE-Attribution and high calculated body fat percentages.

LIMITATIONS

This study is limited by the fact that participants were selected from a pool of volunteers. Participants were all females between the ages of 18 and 23, current students of the University of Mississippi and mostly Caucasian. All participants self reported their body-esteems.

CHAPTER II

REVIEW OF LITERATURE

Merriam-Webster's Dictionary (2009) defines esteem as the regard in which one is held; therefore, body-esteem would mean to which degree of regard one holds about his or her own body. An increasing number of men and women are overestimating their body size (Thompson & Thompson, 1986) and do not feel attractive to the opposite sex (Forrest & Stuhldreher, 2007). These attitudes and viewpoints may decrease self-esteem and body-esteem levels in individuals of differing genders, ages, weights and ethnicities, affecting various aspects of one's life.

Age, Weight and Body-Esteem

The age at which a person becomes aware of his or her body-esteem and self-conscious feelings depends on many factors. Research has suggested this occurs during adolescence, although a specific age is difficult to determine. Through differing ages, body esteem levels can change; however, due to the transitions that occur during the college years, this period of one's life is highly influential upon the formation of lifelong habits (Baranowski, Cullen & Basen-Engquist, 1997; Cullen, Koehly, Anderson, Baranowski, Prokhorov, Basen-Engquist, Wetter & Hergenroeder, 1999). The following sections will summarize at what age body consciousness begins to appear and the influences to body-esteem.

The Onset of Body Consciousness

Younger adolescents evaluate their appearances more positively than do older adolescents (Mendelson, White & Mendelson, 1996), but almost no adolescents think

physical attractiveness is unimportant (Halpern, Udry, Campbell & Suchindran, 1999). Young females must accept the physical changes their bodies are going through as they approach womanhood. At the same time, they are dealing with the pressures of remaining thin to be attractive as well as alluring to boys. Even as evidenced in adolescent girls, pubertal development does not spur an interest in having a boyfriend, but rather it makes girls more self-conscious about their attractiveness (Halpern et al., 1999). Although weight gain can occur in either sex and at any age, women are especially concerned with poor self-image and thus report higher rates of low self-esteem than men (Lowery, Robinson, Befort, Blanks, Sollenberger, Nicpon & Huser, 2005).

Weight and College's Influences

As one study documents, undergraduate students who report low body-esteems have high body mass indexes and body weights compared to students with high body-esteems (Forrest & Stuhldreher, 2007). Even from as early as seventh and eighth grade, Caucasian girls and African-American girls with more body fat than other girls their age are dissatisfied with their weight, report restrictive dieting attempts and are concerned about their eating habits (Halpern et al., 1999). It is important to note that Caucasian girls are more likely to diet restrictively than African-American girls even when their body fat levels are comparable. Also, young African-American girls are more comfortable with themselves at higher levels of body fat than young Caucasian girls (Halpern et al., 1999). Adolescents at a high weight have stronger negative feelings about their weight than just their appearance alone, as weight increases are positively related to negative self-image feelings (Mendelson et al., 1996). College-age men have a

very slight dissatisfaction with weight while women are dissatisfied with their weight as well as particular body parts (Kashubeck-West, Mintz & Weigold, 2005).

The "Freshman 15" is a widespread idea of western society's tendency to gain weight in this first year of college, even though published research has neither supported nor refuted this belief (Racette, Deusinger, Strube, Highstein & Deusinger, 2008). Even still, the majority of college students' weights and body mass indexes increase significantly throughout the college years, with the greatest weight gain occurring during the freshman year (Racette et al., 2008). In a study where college males and females were examined based on their own body weight perceptions, a total of twelve percent for both sexes said they were overweight or obese when they were actually not, based on their body mass indexes (Wharton, Adams & Hampl, 2008). Interestingly, even though most respondents were not overweight or obese, they were still trying to lose or maintain a certain weight (Wharton et al., 2008). As the previous sections discussed, a young person's body- esteem is dependent upon many factors, a couple of which include age and weight.

Body-Esteem and Gender

For more than twenty years, research has pointed to the fact that women are more likely than men to develop problems related to body dissatisfaction; women are more likely than men to be concerned with weight and appearance, to report that their appearance strongly affects their feelings about themselves and to report that their appearance affected their enjoyment in social situations (Kashubeck-West, Mintz & Weigold, 2005). Low body-esteem levels can be found in both males and females, although females are generally thought to deal with the issue more than males. Men may

not be as likely as women to report such body dissatisfaction; however, women have been outnumbering men in this area from adolescence well into adulthood for a number of years (Forrest & Stuhldreher, 2007). The next two sections will discuss the impact of gender on body-esteem as well as the ages gender plays a role.

At the Adolescent Level

Male and female students from India posses drastically different self images, with males possibly having much higher body image levels (Iqbal, Shahnawaz & Alam, 2006). Furthermore, adolescent boys have higher body-esteems than girls of their same ages (Mendelson et al., 1996). A study performed on a sample of adolescents reveals that boys are more likely than girls to have positive self-esteem in the areas of athletic ability and romantic attractiveness (Mendelson et al., 1996).

Males versus Females in Adulthood

Eighty-seven percent of college women show interest in their desire to lose weight while only 36% of men reveal the same desire; however, the number of men and women who actually are overweight according to body mass index classifications does not differ (Kashubeck-West et al., 2005). Women are twice more likely than men to exhibit body dissatisfaction, although both genders report an increasing trend toward thinking their bodies are unattractive to the opposite sex (Forrest & Stuhldreher, 2007). Regarding height, men of above average heights have the highest self-esteems while women of below average heights have the lowest self-esteems; however, individuals of extreme high and low heights report negative self-esteem and self-consciousness (Booth, 1990). Although both males and females overestimate their body sizes, females have

higher body distortion and lower self-esteem levels than males, and a high body distortion is related to low self-esteem (Thompson & Thompson, 1986).

Authors of one study observed that while more male participants were actually overweight or obese than the female participants, a greater number of women were actually attempting to lose weight than men (Wharton et al., 2008). Although only 2.4% of the female participants were overweight or obese compared to 38.9% of the male participants, the women were more likely to be trying to lose or maintain weight; to suffer from false body weight perceptions and to use restrictive diets, drugs such as laxatives, and exercise to lose weight. Inaccurate body perceptions made the women twice as likely as those women with true body perceptions to be attempting to lose weight by inappropriate methods (Wharton et al., 2008).

McKinley's 1998 study reveals that compared to men, women have lower levels of body-esteem and higher levels of body surveillance, body shame and weight discrepancies between what they actually weigh and what they would like to weigh. She also discovered that when objectified body consciousness is controlled, gender and body-esteem are no longer related. Perhaps men feel body shame from non-weight sources (McKinley, 1998). Overall, men have higher self-esteems than women (Booth, 1990).

Women have a stronger relationship than men to how their body satisfaction or dissatisfaction affects their self-esteems (Kashubeck-West et al., 2005). Feminist theory contemplates the idea that women must pay careful attention to their bodies as objects as well as feel shame when they do not live up to cultural expectations (McKinley, 1998). Additionally, when compared with males, females have higher levels of body dissatisfaction as well as eating disturbances (McDonald & Thompson, 1992). Thus,

women are more likely than men to want to lose weight even if their body mass index classification does not suggest they need to (Wharton et al., 2008). The studies discussed reveal the discrepancies between male and female body image thoughts.

Racial and Cultural Differences to Body-Esteem

Race is strongly related to the self-perceptions college women have of their own bodies (Molloy & Herzberger, 1998). A study performed on 95 African-American females enrolled in predominately Caucasian universities found that middle and upper class African-American women are influenced by the drive to be thin, internalizing the Caucasian standard of beauty and the mechanisms used to achieve this standard (James, Phelps & Bross, 2001). An opposing result found that contrary to predictions, college-age African-American women show no difference in self-esteem among higher, middle and lower social classes (Molloy & Herzberger, 1998). Jones and Buckingham (2005) found that college women with high self-esteem score lower for internalization of socio-cultural norms than women with low self-esteem. The next few sections will explain how particular ethnicities' body-esteems are affected in different ways.

Racial Differences at the College Level

Caucasian women internalize thinness even at a young age, making it more difficult for them to accept normal fat gains that come with womanhood (Halpern et al., 1999). Although college-age African-American women may have significantly higher body mass indexes than Caucasian and Asian-American college women, the Caucasian females show a higher incidence of body dissatisfaction and disordered eating than African-American and Asian-American females of similar character (Akan & Grilo,

1995). Caucasian women express body dissatisfaction below what is considered overweight and at a lower body mass index level than minority women of African-American or Hispanic origin; the minority women experience body dissatisfaction when they are already considered overweight by a set standard (Fitzgibbon, Blackman & Avellone, 2000). Caucasian females report past experiences of being teased for weight and size while Asian-Americans have had little of the same experience (Akan & Grilo, 1995). While social physique anxiety relates to body dissatisfaction, the relationship is higher in Caucasian females than African-American females; African-American females show less social physique anxiety, lower levels of body dissatisfaction and higher levels of self-esteem than Caucasian females (Russell & Cox, 2003).

Body Size Influences

Many North American young women adopt their society's current view of beauty to be very thin, likely resulting in low body image (Jones & Buckingham, 2005). Fifteen percent more Caucasian girls than African-American girls in grades seven and eight report a high interest in having a boyfriend; furthermore, those who report interest in having a boyfriend also place value on physical attractiveness (Halpern et al., 1999). Caucasian women and African-American women gain influence mostly by media programs involving women of their same color (Schooler, Ward, Merriwether & Caruthers, 2004). If an African-American woman viewing television shows with African-American casts does not feel competition to a beautiful actress, she may be inspired by the beautiful image rather than damaged; however, most African-American actresses and models have rather light skin, unlike the majority of their viewers (Schooler et al., 2004). Findings have shown that African-American women may be protected from

the low body-esteems expressed by Caucasian women, allowing them to be more satisfied with their bodies due to the statements of African-American men preferring larger female bodies (Molloy & Herzberger, 1998). Also, African-American women often have assertive and strong attitudes that may help with a positive body image, while Caucasian women see themselves as passive and gentle (Molloy & Herzberger, 1998).

African-American Women's Views

Although conflicting research has pointed out that women of color do not feel the same pressures as Caucasian women to be thin, Poran's (2006) study contradicts this idea. She discovered that African-American women do not feel protected from the dangers of Caucasian society's drive for thinness, but rather they feel intense pressure and anxiety from many sources – such as the media and males – to fit in. Many of the women who participated in this study said they felt competition from other African-American women to be beautiful. They also said they think African-American women are misrepresented in the media in regards to body size and perfect skin complexions. Discussions amongst the participants expressed their confusion of why small body types are seen as ideal. Interestingly, although African-American women feel some pressures toward being commanded by Caucasian society to be thin, they question this belief and express exasperation; many felt frustrated when regardless of how educated or successful they were, they were always thinking about their bodies instead of their achievements. African-American women may also notice that the women representing their same population have fairer complexions. An image may be fixed by computer imaging or lighting techniques that may literally lighten the woman in the photograph (Poran, 2006). Despite the skin colors of college women, the authors of the studies discussed have

demonstrated that women deal with body image frustrations in similar as well as in dissimilar ways.

Peer Influence on Self-esteem

The next four sections review the ways in which college students' peers affect self-esteem levels through Greek organizations, peer pressure, media images and social interactions.

Peer Influences

Young women may obtain most of their body consciousness from their comparison groups rather than the positive or negative statements made to them about their bodies (Heinberg & Thompson, 1992). Only young women with a high tendency to compare themselves to their same-sex peers for self-acceptance feel pressure to be thin, and those who emphasize the importance of their physical appearance have a greater chance of being influenced to have a certain body size (Shomaker & Furman, 2007). When body-esteem is not controlled for, college females are greatly and negatively affected by their social group's norms for thinness; for example, a female of this age group is likely to engage in disordered eating if she thinks her friends are accepting of similar behaviors (Giles, Helme & Krcmar, 2007). This vulnerability is more strongly related to a young female who values thinness rather than a young woman who possesses general body dissatisfaction (Shomaker & Furman, 2007). Therefore, a young woman may develop a desire to be thin if her peers are also appearance-conscience even if she was not dissatisfied with herself in the first place (Shomaker & Furman, 2007).

Greek Organizations

The effects of Greek organizations' impacts on female body-esteems have been studied since these associations are comprised of many females interacting in close proximity on a regular basis. One study found that women who joined a sorority gained on average three more pounds than non-sorority women in three undergraduate years (Allison & Park, 2004). Although the undergraduate women started college at similar body mass indexes and with similar mindsets regarding disordered eating and drives for thinness, the sorority women maintained these attitudes throughout three years of college while non-sorority women actually decreased their preoccupations with weight (Allison & Park, 2004).

Social Comparison Studies

One social comparison study of college women was performed by Lin and Kulik (2002). These researchers subjected a group of 69 undergraduate female students to pictures of women who were thin and women who were overweight. Results showed that in social comparison, the participants viewed the thinner woman as more attractive than their own selves while the oversize peer was viewed as less attractive than their selves, despite facial characteristics. This idea influences how a woman perceives herself when in competition with another woman, such as in attracting a male. Participants who viewed the oversize peer or no photograph remained satisfied with their bodies and had more satisfaction with themselves than the group that viewed the thin peer. Women who reported pictures of the thin woman as being more attractive than the heavy woman consequently reported feeling less attractive and with more negative self-perceptions than

the heavy women did. The image of the thin woman also made the women respondents feel less confident in their attractiveness to a male (Lin & Kulik, 2002).

Jones and Buckingham (2005) performed a study similar to Lin and Kulik's and found comparable results. These researchers found that downward comparison in both low self-esteem and high self-esteem individuals was not as influential on body-esteem as upward comparison. Low esteem individuals reported higher body-esteems after downward comparison than upward comparison. On the other hand, high esteem individuals reported just the opposite; they had higher body-esteems after upward comparison than downward comparison. Whether or not a woman feels self-conscious after seeing an attractive woman depends on her own self-esteem. High self-esteem and positive affect are both associated with high body image perceptions in college-aged women (Jones & Buckingham, 2005).

The Media's Effects on Body-Esteem

In the media, downward comparison with plus-size models is not widely available, but rather the upward comparison to rail-thin models makes women feel self-conscious and less attractive (Lin & Kulik, 2002). Krcmar, Giles and Helme (2008) made interesting observations in a study relating thin ideals with media images. These researchers surveyed incoming college freshmen women of many races about body-esteem, parent and peer norms, media exposure, and social comparison to media images. They found that young women who experience negative comments from both peers and parents about being thin have lowered body-esteems. Also, low body image is associated with the exposure of images of fashion models and celebrities in fashion and fitness magazines (Krcmar et al., 2008). Both findings are related: young women who have

career choice? Confident women with high self-esteems are more likely to choose challenging careers, believing in their abilities to perform and to meet demands; on the other hand, self-conscious women are likely to choose less challenging careers that provide little to no opportunities of advancement if they believe they are not worthy of such success. Based on these ideas, it can be concluded that women with low self-esteems may not achieve high extrinsic success from their jobs or an income that would reflect their achievements.

These researchers also thought that perhaps self-esteem does not come from status when people focus on the positive aspects of their job that they do well. In this way, people can feel high self-esteem if they are performing any number of jobs that complement their personality traits. Self-esteem affects career outcomes; however, career outcomes do not affect career successes, because each person perceives career outcomes differently (Kammeyer-Mueller et al., 2008). It is important to realize that each person may define success in his or her own terms; for example, one person's career success may be another's family success. While some occupations may be held with higher prestige in society than others, each person may have their own opinion about what is actually prestigious.

Additionally, Zuckerman (1980) noted that intelligence and attractiveness are both correlated with self-esteem. In some occupations and work settings, the physical looks of a person may help them perform well in the job. Women tend to rate themselves as less attractive than men rate themselves, so a woman might put more emphasis on her looks to try to obtain a job or she may not apply for a job she does not think she is literally outfitted for. Traditionally, homemaking was viewed as an obligation while now

it may be seen as an attractive option. Therefore, a woman with a prestigious career may view herself as equally confident as a woman who is a homemaker, because her activity in her interest is what drives her self-esteem (Zuckerman, 1980).

Education

Educational goals and self-confidence are greatly specific personality characteristics (Zuckerman, 1985). It is possible for self-esteem to affect education and knowledge, which would thus positively or negatively affect career success. Higher levels of competence and social self-concept results in fewer desires to be thin; however, academic success does not always reduce body dissatisfaction (James, Phelps & Bross, 2001). Increases in education levels should positively affect self-esteem, but the reverse may not be true (Kammeyer-Mueller et al., 2008). After a woman obtains a degree or specialized training in a particular field, she may feel more prepared for the workforce. If this is true, her self-esteem would increase from the new knowledge, because she will feel more adequate amongst her colleagues.

Young women may also be considering their future family when considering the occupation in which they want to work. Some women plan on obtaining a career post-graduation, but the prospect of a family may affect their career choices. In one study, 22% of women said they would want to be full-time homemakers while their children are young, while men were more likely to be employed full-time with young children (Zuckerman, 1985). Still, education does play an important role to both men and women later in life; both sexes reported an 86% preference to work while they have teenage children (Zuckerman, 1985).

Income

Just as people match their jobs to their abilities, they also match their jobs to their self-regard (Kammeyer-Mueller et al., 2008). It is ideal for a woman to work in a career where her personality matches her job description. When a woman is suited for a job, she should feel a high sense of pride from her accomplishments as well as her reflected income. Prestigious jobs which also tend to offer a higher pay are competed for by young men and women who have high confidence levels (Zuckerman, 1980). The literature presented tells how self-esteem levels can affect career successes, statuses, education levels, and incomes.

Dating and Self-Perceptions

Self-esteem does not affect commitment levels of undergraduate couples, but it does positively correlate with satisfaction in relationships (Arriaga, Slaughterbeck, Capezza & Hmurovic, 2007). Researchers found that along with psychological abuse, undergraduate college women report self-esteem as a significant predictor of intimacy in a dating relationship, and regardless of how high or low a woman's self-esteem level is, all women of the particular study's subjects report damaging effects of psychological abuse on their relationships (Katz, Arias & Beach, 2000). The following sections will cover studies and ideas relating to how dating relationships can affect young women's body- esteems as well as how their individual body-esteems affect their relationships and their partners.

A Study of the Self-Verification Theory

Evans and Stukas (2007) studied the Self-Verification Theory with couples of various ages. Results show that both partners in a close relationship show mutual influence on each other regarding appearances, weights, moods and sexual interactions. If these influences are negative, couples experience body dissatisfaction, poor moods and sexual avoidance. The ways in which males view their partners and their selves are positively related: males who report negative feedback about their partner's body also report critical thoughts of their own body. Also, males who report body dissatisfaction tend to date females who also report body dissatisfaction, who engage in disordered eating behaviors and who experience weight depression. Women who seek feedback about their bodies are likely to be in relationships with a male who consistently provides such comments, even if they are negative and only increase the negative self-perceptions the women hold (Evans & Stukas, 2007). This study was the only one relating self-verification to body-esteem found at the current time.

A Relationship's Effect on Self-Perceptions

In terms of dating, above average fat levels as well as average fat levels prove to be hardships when finding a boyfriend while below average fat levels makes it easier and possibly twice as likely for a girl to date than a girl of her same height but of average weight (Halpern et al., 1999). Lin and Kulik's (2002) study reveal further explanations to the self-perceptions women have while in dating situations. When the respondents felt as though they were in competition with a thinner woman for a male's approval, they were less confident about being chosen and reported being less attracted to the male compared

experiences a person has (Sciangula & Morry, 2009). Thus, it can be predicted that if both persons in a relationship have high levels of self-esteem, then the couple will have high relationship satisfaction. The previous sections presented how satisfaction resulting from collegiate dating relationships is affected by the body image issues the partners possess.

As the published research reviewed indicates, body-esteem levels of women are influenced by many factors and may affect various aspects of their lives. To more closely examine this idea, a sample of female university students ranging in age from 18 to 23 with various body compositions will be analyzed to see if they perceive themselves to have less attractive bodies than their actual calculated body compositions indicate.

CHAPTER III

METHODOLOGY

This chapter describes the methods and procedures used in this investigation. Methods and procedures discussed include: participants, experimental tests and procedures, instrumentation, and techniques and statistical design.

Participants

Eighty-five students at the University of Mississippi participated in the study. Participants were female, between the ages of 18 and 23 years old. All participation in this study was voluntary. Participants were recruited using Institutional Review Board approved fliers (Appendix A) that were posted around the University of Mississippi campus in female residence halls and in the fitness center. Classroom announcements were made and the fliers were passed out to students. Also, the script was sent via e-mail to qualifying potential subjects.

Experimental Procedures

All experimental procedures were conducted in the University of Mississippi Nutrition Clinic under controlled and comfortable conditions and approved by the University of Mississippi Institutional Review Board (Appendix B *IRB approval letter).* A date and time for the data collection was arranged between the primary investigator and the subject. At the beginning of the data collection appointment, the subject was introduced to the study, the survey and the BOD POD which calculates body compositions. The researcher verified that the subject was in approved attire before the subject's height was measured and recorded to the nearest 0.25 inch and before the

subject's weight was measured to the nearest thousandth of a pound. The scale used to weigh the subject was connected to the BOD POD and the result was entered into the machine automatically. Lastly, the subject performed the BOD POD body composition test including the thoracic gas volume measurement.

Survey Completion

Subjects completed the Body-Esteem Scale for Adolescents and Adults (Appendix C) and were labeled by a non-identifying subject number.

Body Composition Assessment

Subjects were introduced to the Life Measurement, Inc. BOD POD *Gold Standard* body composition software machine. Subjects were tested by a trained investigator under the recommended conditions of no food, drink or exercise for the two hours prior to the test; in tight, minimal clothing; with a swim cap compressing the hair on their head; and at a resting state. Each subject performed the measured thoracic gas volume test to obtain the most accurate percent body fat measurement. Subjects received their calculated results of body weight, percent fat mass, percent fat-free mass, fat mass in pounds, and fat-free mass in pounds. Results were explained to the subjects and questions about the individual's results were answered.

Body Composition Measurement

The BOD POD *Gold Standard* body composition tracking machine uses whole body densitometry, which measures body mass and volume to estimate how much fat and lean tissue is present in the body (Life Measurement Inc, Concord, CA). The subject's

mass is measured by a scale and her volume is measured in the BOD POD by air displacement plethysmography. Based on these values, the subject's percent fat mass and percent fat-free mass is calculated. The BOD POD's percent body fat results include approximately 12-15% essential body fat for females, so it is not recommended for women to have less than 15% body fat (Life Measurement Inc, Concord, CA).

Instrumentation

The BOD POD uses body density to derive body composition, formulated by the subjects mass divided by the subject's volume (M_B/V_B) (Life Measurement Inc, Concord, CA). Body composition is broken down into fat-free mass – protein, water, mineral and glycogen – and fat mass. Where F is fat mass, D_F is the density of fat, FFM is fat-free mass and D_{FFM} is the density of fat-free mass, percent fat is defined as:

$$\% \text{ fat} = \left[\frac{D_F D_{FFM}}{D_B(D_{FFM} - D_F)} - \frac{D_F}{D_{FFM} - D_F} \right] X\ 100\%$$

Since the densities of fat and fat-free mass vary among race, gender and age, two different equations are used in this study to calculate the densities determined for each population.

The general population's densities are calculated by the Siri (Siri, 1961) equation where percent fat is equal to $[(4.95/D_B - 4.50)*100]$. The African-American population's densities are calculated by the Ortiz (Ortiz, Russell, Daley, Baumgartner, Waki,

Lichtman, Wang, Pierson & Heymsfield, 1992) equation where percent fat is equal to [(4.83/D_B – 4.37)*100] (Life Measurement Inc, Concord, CA).

Reliability and Calibration of Instruments

Reliability of the Body-Esteem Scale for Adolescents and Adults was assessed and retested to a subsample 3 months after their initial test, resulting in high correlations: BE-Appearance $r(95) = .89, p < .001$; BE-Weight $r(95) = .92, p < .001$; BE-Attribution $r(95) = .83, p < .001$ (Mendelson, Mendelson & White, 2001).

The BOD POD was calibrated daily based on the Quality Control (QC) procedures designed by Life Measurement, Inc (Life Measurement Inc, Concord, CA). The following QC procedures were performed sequentially and without interruption: system warm-up, analyze hardware, scale calibration, autorun and volume. The BOD POD was turned on 30 minutes before any other QC procedures were begun, to ensure the system and its components had reached its optimal operating temperature. Hardware was analyzed with a passing confirmation – confirmations are displayed on the BOD POD's component computer screen with "PASS". Scale calibration ensures that the scale is properly balanced and was confirmed with a "PASS" result. Autorun assesses environmental and other BOD POD stability, confirmed with a "PASS" result. The volume QC procedure evaluates the BOD POD volume performance, confirmed with a "PASS" result.

Statistical Design

Cronbach's alpha was applied to assess reliability of the three scales (BEAPP, BEWT and BEATT) on the population included, using SPSS software (version 17.0,

SPSS, Inc. Chicago, IL). Descriptive statistics (minimum, maximum and mean) were analyzed on the subject pool to evaluate results of the three scales (BEAPP, BEWT and BEATT) age, ethnicity and percent body fat of the group. Pearson's correlation coefficient will be considered between percent body fat and each of the three scales (BEAPP, BEWT and BEATT) to reveal significant and non significant relationships; alpha was set at $p = 0.05$.

CHAPTER IV

RESULTS

Eighty-five subjects completed the investigation with data from 83 considered in the analyses. Observations from two subjects were dropped from the analyses secondary to non-completion of the Body-Esteem Scale. Percent body fat ranged from 13.8% to 49.8% with a mean of 27.48% and a standard deviation of 6.37%. To assess reliability of the three scales (BEAPP, BEWT and BEATT) on the population included, Cronbach's alpha was applied using SPSS software (version 17.0, SPSS, Inc.Chicago, IL). The three scales BEAPP, BEWT, and BEATT showed reasonable levels of internal consistency with Cronbach's alpha of 0.895, 0.916 and 0.730 respectfully.

Descriptive statistics for the population pool are shown in Table 1. All subjects were females between the ages of 18 and 23 with a mean age of 20.8 years. Eighty-nine percent of the group was Caucasian, 9% was African-American and 1% was Hispanic/Latino. Forty-six percent of the group belonged to a Greek sorority while 54% of the subjects were not members of a Greek sorority. Thirty-nine percent of the subjects were classified by number of completed credit hours as college seniors, 26% were juniors, 20% were sophomores, 8% were freshmen and 7% were graduate-level students. Results are not analyzed based on the demographics presented because this information did not offer significant relationships to percent body fat and body-esteem levels of the subjects.

Table 1. Descriptive Statistics of Population Pool (n = 83)	
Characteristic	Percent
Ethnicity:	
Caucasian	89%
African-American	9%
Hispanic/Latino	1%
Member of Greek sorority	
Yes	46%
No	54%
Classification:	
Senior	39%
Junior	26%
Sophomore	20%
Freshman	8%
Graduate-level	7%
Note. M age = 20.8 years (range = 18-23); n = 83	

Pearson's correlation coefficients between percent body fat and each of the three scales shows statistically significant negative correlations between body fat percent and with BEAPP (r = -0.323) and BEWT (r = -0.528) with significance set at the 0.01 level. Percent body fat was not significantly correlated with BEATT (r = -0.212). Based on the above, the null hypotheses considered in this investigation are supported or rejected as follows:

HO_1: There is no significant relationship between college-aged women with low BE-Appearance and high calculated body fat percentages. The null hypothesis is rejected.

HO_2: There is no significant relationship between college-aged women with low BE-Weight and high calculated body fat percentages. The null hypothesis is rejected.

HO_3: There is no significant relationship between college-aged women

with low BE-Attribution and high calculated body fat percentages. The null hypothesis failed to reject.

CHAPTER V

DISCUSSION

Results of this study reveal that there is an inverse relationship between calculated body fat percentages and body-esteems. There is a statistically significant inverse correlation for college-aged women between percent body fat and how they think about their own appearances, as measured by the Body-Esteem Appearance subscale (e.g., "I like what I see when I look in the mirror"). Percent body fat and weight satisfaction – as measured by the Body-Esteem Weight subscale (e.g. "I really like what I weigh") – are also negatively correlated. Our results show that women with low percent body fat levels positively evaluate their appearances and their weights, and women with high percent body fat levels negatively evaluate their appearances and their weights. Finally, percent body fat is not significantly related to the way one attributes other individuals' evaluations about their self; as measured by the Body-Esteem Attribution subscale (e.g. "People my own age like my looks"). Our results indicate that women with high percent body fat levels negatively attribute the way they think others evaluate their appearances, but results between these two variables are not statistically significant. In the development of the Body-Esteem Scale, it was similarly found that BEATT correlated more highly with social self-esteem subscales (Mendelson, Mendelson & White, 2001).

Our results reveal that as young women in the appearance and weight subgroups measure lower in percent body fat, they reflect higher feelings of body-esteem. Our results are consistent with other research. During the testing of the Body-Esteem Scale, it was found that heavier individuals had lower body-esteem (Mendelson, Mendelson & White, 2001). Sarwer, Wadden & Foster (1998) also found the same association,

reporting that women's body dissatisfaction is positively related to percent body fat. They observed that obese women had more body dissatisfaction than nonobese women. In their results, obese women with a mean age of 45.14 ± 9.57 years scored higher on the Body Dysmorphic Disorder Examination – Self-Report questionnaire than nonobese women, suggesting that these obese women had more body image dissatisfaction as a whole as well as dissatisfaction with specific aspects of their appearances. They also had moderate to extreme body image dissatisfaction, were upset about their appearances more often and felt that their appearances were not normal. Interestingly, these researches pointed out that there was no relationship between body image dissatisfaction and body mass index levels for both obese and nonobese women, suggesting that body image dissatisfaction may be a result of factors other than weight.

Forrest and Stuhldreher (2007) also found similar results, stating that body image dissatisfaction and body image distortion are closely related. They found the same inverse relationship for body-esteem and body mass indexes. In their study, students who were dissatisfied with their body images had a significantly higher body weight and body mass index compared to satisfied students. Geller et al. (1997) noted that although one's shape and regional adiposity is not related to one's actual body weight, these two factors influence one's self-esteem. Davis et al. (1994) found that the women of their study were most dissatisfied with the regions in which they store fat – namely, the hip region. Our research was limited to measuring total body fat percentages and not regional fat deposits; therefore, we did not report a link between body-esteem and regional adiposity as other researchers have studied.

Research has demonstrated a link between perceived body images and actual body-esteems. Individuals who strongly believe in controlling their own weights may report body dissatisfaction as well as negative self-esteems, because they feel as though they are responsible for maintaining a specific weight (Laliberte, Newton, McCabe & Mills, 2007). Negative body image may also be reported from women wanting to be thin and lean because very thin women are seen as attractive and sexually appealing (Davis et al., 1994); these women would be focusing more on a size rather than on characteristics such as fitness and strength.

Further research has demonstrated that body dissatisfaction results from self-perceptions of fat and weight or other anatomical factors (Davis, Durnin, Dionne & Gurevich, 1994). Geller, Johnston and Madsen (1997) and Kostanski and Gullone (1998) found similar results of self-esteem regarding shape and weight being influenced more by an individual's perception of his or her own weight and body dissatisfaction rather than an actual body weight. These results reflect the concept of self-schemas, which positively associates an individual's negative body feelings with negative self-attitudes (Higgins, 1987).

In our study, levels of body satisfaction and dissatisfaction were self-reported by the subjects. Any dissatisfaction reflected likely was a result of the sole perception of body weight and image these women had of their own self (Adams, Katz, Beauchamp, Cohen & Zavis, 1993). In one study, 36% of women perceived themselves to be overweight or obese but only 22% actually were according to their body mass indexes (Wharton et. al., 2008). Another study revealed that young women believed they were too fat (Cooper, Taylor, Cooper & Fairburn, 1987) whether or not they actually are.

Therefore, actual body weights and body fat percentages do not always moderate body satisfactions or body-esteems.

Conclusion

Our results indicate an inverse relationship for body fat percentages and body-esteems in the population of University of Mississippi female students. The appearance and weight subgroups were significantly correlated while the attribute subgroup was not quite significant. Further research should study the link between self-perceptions and calculated body compositions in a different population and/or in a different mix of ethnicities, ages and genders. Also, the relationships between self-perceptions and other physical or emotional characteristics other than body composition should be studied.

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