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# Table of Contents

Acknowledgements.................................................................................................................. i
Table of Contents..................................................................................................................... ii
List of Tables............................................................................................................................. iii
List of Appendices..................................................................................................................... iv

## Chapter

I. Review of the Literature......................................................................................................... 1
II. Rationale and Hypotheses..................................................................................................... 47
III. Method................................................................................................................................. 50
IV. Proposed Analyses.............................................................................................................. 53

References................................................................................................................................. 54
Appendices................................................................................................................................. 66

V. Dissertation............................................................................................................................ 69
References................................................................................................................................. 88
Tables.......................................................................................................................................... 95
Appendices................................................................................................................................. 102
Summary...................................................................................................................................... 106
List of Tables

Chapter V

A. Chi Square Results of Adjective Pairings with Stimulus Figures ........................................ 95
B. Follow-up Chi Square Results for Negative Adjectives ....................................................... 96
C. Follow-up Chi Square Results for Positive Adjectives ....................................................... 97
D. Frequencies of Negative Adjective-Body Shape Pairings by Sex ....................................... 98
E. Frequencies of Positive Adjective-Body Shape Pairings by Sex ....................................... 99
F. Frequencies of Negative Adjective-Body Shape Pairings by Self-Reported Weight
   Status ........................................................................................................................................ 100
G. Frequencies of Positive Adjective-Body Shape Pairings by Self-Reported Weight
   Status ........................................................................................................................................ 101
List of Appendices

Proposal

A. Online Survey: Adjective Pairing Task ................................................................. 66

Chapter V

A. Online Survey: Adjective Pairing Task ................................................................. 102

B. Xavier University IRB Approval Letter .................................................................. 105
Chapter I

Review of the Literature

Obesity

One-third of adults in the U.S. population are overweight and another one-third are obese. Among American men, 32% of non-Hispanic white men, 37% of African American men, and 35% of Mexican American men are obese. In each of these ethnic categories, obesity has increased by 10% in the last 20 years (Centers for Disease Control and Prevention, 2009a; Ogden & Carroll, 2010). In 2007-2008, 33% of non-Hispanic, 49.6% of African American, and 45.1% of Mexican American women were obese (Ogden & Carroll, 2010). Additionally, the rate of obesity among American youth aged 2 through 16 has tripled in the past 30 years (Centers for Disease Control and Prevention, 2009a). Approximately 18% of children and adolescents are overweight, with Mexican American male and African American female adolescents having the highest prevalence rates (Centers for Disease Control and Prevention, 2009a). Nearly 15% among two to four year-old children (n = 2,222,410) from low-income families met obesity criteria (Centers for Disease Control and Prevention, 2009b).

Body weight is developed and maintained through caloric intake. When an individual consumes the same amount of calories (energy) as the body expends, body weight is maintained. However, when an individual expends less energy than he or she consumed, he or she will gain weight, which may lead to overweight or obesity (National
Institutes of Health, 2010). Therefore, if an individual is physically inactive, it is likely that he or she will gain weight. Also, eating food and meals, whether healthy or unhealthy, high in calories contribute to weight gain (National Heart, Lung, & Blood Institute, 1998). Insufficient sleep (i.e., less than seven hours of sleep a night) creates a hormone imbalance, which may increase appetite and food consumption (Mayo Clinic, 2010). In addition to caloric intake and expenditure, genetic, behavioral, environmental, and socioeconomic factors can contribute to overweight or obesity.

Several health conditions can lead to the development of overweight and obesity (National Heart, Lung, & Blood Institute, 1998). An underactive thyroid can slow metabolism and is correlated with weight gain. In Cushing’s syndrome, the adrenal glands produce excess amounts of cortisol, which is also associated with weight gain (National Heart, Lung, & Blood Institute, 1998). Certain medications, including antidepressants and anti-seizure prescriptions, can lead to increased weight (Mayo Clinic, 2010). Also, infant temperament at age one has been associated with weight status at age six (Faith & Hittner, 2010). After controlling for demographic variables and BMI, highly soothable one year-old infants were more likely to be obese at age six as well as male infants with poor attention at age one.

Accompanying the increase in obesity prevalence rates is an increase in medical costs for obese individuals. Finkelstein, Trogdon, Brown, Allaire, Dellea, and Kamaal-Bahl (2008) conducted analyses on the 2001-2004 Medical Expenditure Panel Survey (MEPS). The MEPS assessed the utilization of civilian noninstitutionalized healthcare services in the United States. Non-Hispanic whites and African-American adults (80% and 20% of the sample, respectively) who reported their weight and height were included
in the sample. The prevalence of obesity ranged from 7.4% to 22.1% per ethnic and sex category. For a 20 year-old normal weight (BMI 18.5 - 24.9) White woman, the predicted lifetime cost of weight-based medical expenditures is approximately $8,120. For a 20 year-old obese (BMI ≥ 35) White woman, the predicted lifetime weight-based medical expenditure is around $21,550, whereas the cost is $5,340 for an African-American woman of the same age and BMI. This difference may indicate a difference in the utilization of medical services rather than racial differences in medical expenditure. Based on these predictions, medical expenditures are somewhat costly for overweight and obese individuals.

Methods to Define Weight Status

Whereas “overweight specifically refers to an excessive amount of body weight that may come from muscles, bone, adipose (fat) tissues, and water,” “obesity specifically refers to an excessive amount of adipose tissue” (National Institutes of Health, 2010). Body fatness is frequently measured by the Body Mass Index (BMI). The BMI formula, when measured in kilograms and meters, is the person’s weight divided by the person’s height squared. The resulting score is then classified into weight categories: underweight (BMI < 18.5), normal (BMI 18.5 – 24.9) overweight (BMI 25.0 – 29.9), obesity (BMI 30.0 – 34.9), and extreme obesity (BMI ≥ 35.0) (Centers for Disease Control and Prevention, 2009e, National Institute of Health, 1998). For example, a woman who is 5’5” and weighs 140 pounds would be classified with a normal weight status and a woman who is 5’5” and weighs 160 pounds would be classified as overweight. BMI is widely implemented because it is a simple calculation of body fatness that requires only
weight and height measurements. Unfortunately, BMI only provides correlational information and is not a direct measure of body fatness.

Also, BMI does not take into consideration muscle distribution, which can allow for muscular individuals to have a higher BMI. For example, football player Troy Polamalu is 5'10" and weights 207 pounds (National Football League, 2011). According to BMI, Troy would be classified as overweight (BMI = 29.7). Moreover, professional wrestler John Cena is 6'1", weighs 240 pounds, and would be classified as obese (BMI = 31.7) (World Wrestling Entertainment, 2011). These athletes would be considered toned and muscular, not overweight or obese. A major limitation of the BMI is that it does not take into account muscle distribution in classifying weight status.

Body shape is another measure of body weight that represents the distribution of fat through the torso, hips, and limbs. For instance, an underweight body shape is slim and narrow with relatively no fat on the body whereas an obese body shape is round (Stunkard, Sorenson, & Schulsinger, 1983).

**Prevalence of Weight Discrimination**

Obese individuals frequently experience weight discrimination in their workplaces, social settings, and daily lives (Puhl, Andreyeva, & Brownell, 2008; Puhl & Brownell, 2001). According to Puhl et al. (2008), “discrimination...refers to negative, unequal prejudice and beliefs of people because of their membership in a particular group” (p. 992). In work environments, overweight individuals can experience unequal employment opportunities, wage discrimination, limited promotion opportunities, and early termination (Judge & Cable, 2010; Maranto & Stenoien, 2000; Paul & Townsend, 1995). In healthcare, overweight individuals may experience negative reactions from
physicians and mental health care professionals, which may increase the probability that they will not utilize services in the future (Schwartz, Chambliss, Brownell, Blair, & Billington, 2003; Teachman & Brownell, 2001). Throughout education advancement, overweight students often receive negative comments from peers (Eisenberg & Neumark-Stzainer, 2003; Zeller, Reiter, Purtill, & Ramey, 2008). A variety of weight discriminations exist in everyday life, such as airline seat sizes not of adequate size for larger customers, teasing from peers and family, weight-related comments from loved ones, and the possibility that weight status may have an impact on the right to adopt children (Eisenberg, Neumark-Sztainer, Story, 2003; Puhl & Brownell, 2001; Sheets & Ajmere, 2005).

Puhl et al. (2008) investigated types of discrimination experienced by individuals throughout their lives. The National Survey of Midlife Development in the United States was conducted in 1994-1995 and followed-up 10 years later from 2004-2005 to assess health, well-being, and social interactions on a nationally representative sample of adults aged 25-74 years (N = 2,290) in the United States. Participants reported discrimination by indicating how many occurrences of discrimination they experienced throughout their lifetime, and the specific reason for the discrimination. The options for discrimination included age, gender, race, height, weight, nationality or ethnicity, appearance other than weight or height, sexual orientation, religion, and other reason. Ten percent of women in the sample reported daily or lifetime discrimination due to weight, whereas nearly 5% of men reported discrimination. Since daily and lifetime discrimination were condensed into one variable, this result is minimal because it is unclear whether discrimination occurred frequently in daily life or periodically throughout a lifetime. These percentages
could depict the percentage of lifetime discrimination, daily discrimination, or both. Nearly 60% of participants reported weight/height-based discrimination in their employment at least four times throughout their lifetime, which suggests that overweight individuals are likely to experience negative comments from their employers and coworkers. Younger members of the sample reported greater amounts of discrimination. Additionally, there was a significant increase in the amount of discrimination as participants’ BMI increased. African American participants reported frequent discrimination, with 23.9% of women and 12.7% of men reporting discrimination. Discrimination based on gender was the most prevalent type of discrimination among all participants followed by age, race, and weight discrimination. Among women, discrimination based on weight/height was the third most prevalent type of discrimination falling behind gender and age-based discrimination.

Andreyeva et al. (2008) further analyzed the data from the National Survey of Midlife Development, but limited the sample to 35-74 year-old participants ($N = 1,136$). The frequency of discrimination based on weight significantly increased from 7.3% at baseline to 12.2% at post assessment ($p < 0.01$). From baseline to follow-up, weight-based discrimination for women significantly increased by 15%. The prevalence of weight discrimination for men was 4.1% at baseline and 8.1% at follow-up. The most endorsed reason for weight-based discrimination was interpersonal relationships, which included being treated with limited respect or courtesy during daily interactions. The authors hypothesized that the increase in weight-based discrimination may be due to weight stigma or to the increase of overweight and obesity in the population. Discrimination based on age and gender increased from baseline to follow-up, whereas
racial-based discrimination declined. Finally, weight-based discrimination was most prevalent for individuals with BMIs at or above 27 (overweight). A major flaw of the National Survey of Midlife Development was that the data were not analyzed for weight trends. Participants’ weight status was not examined from baseline to follow-up restricting the results to weight status at each point of the evaluation. It cannot be determined if changes in the prevalence of discrimination co-occurred with changes in BMI.

**The Effects of Weight Perceptions in Social Domains**

The perceptions people make about each other are often based on visible physical characteristics, such as weight (Richardson, Goodman, Hatorf, & Dornbusch, 1961). The associations made between weight, characteristics (sexuality, attractiveness), and abilities (work performance) can influence how people perceive and interact with overweight and obese individuals (Larkin & Pines, 1979; Neumark-Stzainer, Story & Harris, 1992; Roehling, 2002; Singh, 1993; Strauss & Pollack, 2003; Teachman & Brownell, 2001). The effects of weight perceptions have been associated with employment wages and discrimination, relationship satisfaction, adolescent friendships, and sexuality (Halpern, Udry, Campbell, & Suchindran, 1999; Paul & Townsend, 1995; Renna, Grafova, & Thakur, 2008; Sheets & Ajmere, 2005).

**Employment**

Discrimination against overweight individuals in the workforce may be related to their being stereotypically perceived as incompetent, inactive, disorganized, unproductive, and lazy (Larkin & Pines, 1979). In the workforce, overweight individuals are believed to function slowly, be frequently absent due to poor health, and make
inadequate role models. These perceptions of overweight individuals may lead
employers to pursue job termination. Nevertheless, undeserved terminations based only
on an employee's weight can be battled in a court of law. However, weight limitations
have been successfully implemented in some professions, including the police and fire
forces, in which physical capabilities and endurance must to be maintained. Furthermore,
some professions may terminate or refuse to hire overweight individuals because they do
not look proper in their uniforms or cannot easily maneuver around equipment.
Nevertheless, declining and terminating employment based on weight is unsubstantiated
in most work environments (Paul & Townsend, 1995).

However, employers have reported several justifications for differentially treating
employees based on weight (Roehling, 2002). For example, obese individuals are often
believed to have negative characteristics, such as being lazy and unintelligent, that may
be associated with poor work ethic and performance (Larkin & Pines, 1979). A second
justification is a belief that obese individuals make a conscious choice to become obese
and prefer to be sluggish rather than productive (Roehling, 2002). Therefore, others view
the individual as personally responsible for his or her weight. Another reason to justify
weight discrimination is that the employer is reacting to pressure from others in the
company. For example, a superior may urge a manager to terminate an obese individual
because the superior does not believe the employee matches the company's image or
standards. The most widespread justification for weight discrimination is the expected
higher costs of having an obese employee. It is presumed that hiring obese employees
will increase insurance premiums, create greater absenteeism, and require companies to
make special accommodations for obese employees. For instance, an employer chose not
to hire an obese employee because the employee would require a larger office desk and chair in comparison to the furniture that already existed in the company (Roehling, 2002). Although many view discrimination as being morally reprehensible, those who engage in these practices have developed several justifications as to why obese individuals should not be in particular occupations in the workforce.

Bellizi and Hasty (2000) investigated whether prior successful work experience by obese individuals mitigated discriminatory hiring practices. Approximately 400 predominantly White male sales managers from various industries throughout the United States completed surveys that assessed the likelihood of placing a new recruit into a sales position. Participants read a personnel file that manipulated the recruit’s gender (male/female) and weight (very athletic/obese). Employment history was also manipulated in the personnel file by indicating successful work experience or first time employment. The participants read a summary of two sales territories where the recruit could be placed with a company. One territory would require a very responsible, hardworking salesperson, whereas the other territory did not require much work effort or had little competition with local businesses. The participants then rated how well the new recruit would fit into each of these territories. Results indicated that the very athletic recruits were selected significantly more frequently for the hard-working territory than obese recruits. Neither first-time-employment nor previous-successful-work-experience for obese individuals made them more preferred candidates for either work territory. Moreover, athletic recruits without previous-work-experience were rated significantly more likely to fit the hard-working sales territory than obese recruits who had successful-work-experience. There were no significant differences in participants’ choices of obese
or very athletic candidates in the less competitive territory. This study indicates that
obese individuals are less likely to be hired for sales positions than very athletic
candidates even when controlling for previous employment success. A limitation of the
study is that weight was not adequately manipulated in that “very athletic” is a
characteristic of a person whereas “obese” reflects a BMI category. Although both
descriptions lead individuals to imagine a certain body shape, the terms are qualitatively
different and do not adequately reflect weight differences.

Weight discrimination in the workplace also extends to wages (Judge & Cable,
2010; Maranto & Stenoien, 2000). For example, women who are 20% overweight have
been found to have a 12% decrease in wages as compared to both average weight
National Longitudinal Survey of Labor Market Experience of Youth. Participants \( n =
6,601 \) from ages 23 to 30 were interviewed first in 1979 and each following year until
the survey was completed. The authors hypothesized that morbid obesity status (body
weight 100% over the norm for a person’s height) would negatively impact work wages.
Considering that the American culture overly emphasizes a thin body as the ideal shape,
the authors also hypothesized that there would be a negative effect of mild obesity (body
weight 20-40% over norm for one’s height) as well. Obese women were found to have
significantly lower wages than men of all weights, and this effect was more significant
for White women compared to African American women. Mildly obese White women
experienced a 5.8% wage decrease, whereas morbidly obese white women experienced a
24.1% wage decrease. These rates remained significant after controlling for education,
work experience, and tenure. Conversely, obese men had a significantly positive increase
in wages as their weight increased. White and African American men who were 100 pounds over standard weight experienced significant increases in wages (2.7% and 21.8%, respectively.) The investigation demonstrates mixed results for obesity status and wage discrimination. Whereas women's wages decreased with weight, men's wages increased. The authors suggested the difference in wages may be due to social norms that suggest a woman should maintain a small figure whereas this ideal does not exist for men.

In a recent study, Judge and Cable (2010) investigated the relationship between weight and income for adult participants in Germany and the United States. Analyses were conducted on participants in the German Socio-Economic Panel Study \((n = 11,253)\) and The National Longitudinal Surveys of Youth 1979 \((n = 2,303)\) in the United States. The central variables of the study were the effects of weight and gender on employment wages. Before conducting these analyses, the authors controlled for participants' height, age, marital status, number of school-aged children in the family, maternal/paternal leave from work, overall health, hours worked, education, ethnic minority status, work training, intrinsic job characteristics, self-esteem, type of industry, and civil service employment by including these variables as covariates. The effects of weight and gender on wages had similar outcomes in the German and United States samples. For women, a negative linear correlation existed between weight and wages. For example, very thin women had an income of $3,981 more per year than average weight women in the German sample. Moreover, increases in women's weight were correlated with decreases in salary. This effect was greatest for thin employees. In the United States sample, an increase in weight by two standard deviations \((M = 147.12 \text{ lbs.}, SD = 25 \text{ lbs.})\) for women predicted an
$18,902 earnings decrement. For men, a positive relationship existed between weight and wages. However, this relationship eventually becomes curvilinear suggesting that when men reach a certain heavier weight there becomes a less positive relationship with wages. The correlational nature of the investigation does not provide a causal link between weight and wages.

In the workforce, obese employees do impose indirect costs on their companies (Finkelstein, DiBonaventura, Burgess, & Hale, 2010; Trogdon, Frinkelstein, Hylands, Dellea, & Kamal-Bahl, 2008). Finkelstein et al. (2010) analyzed data from the 2006 Medical Expenditure Panel Survey ($n = 8,875$) and 2008 U.S. National Health and Wellness Survey ($n = 24,140$) to determine per capita expenses and cumulative costs of medical expenditure, absenteeism, and presenteeism for full-time employees who were overweight (BMI 25.0 – 29.9), had grade I obesity (BMI 30 – 34.9), or had grade II obesity (BMI $\geq 35$). All analyses controlled for smoking status, marital status, insurance coverage, education, household income, region of United States, and ethnicity. Medical expenditures included costs for office visits, emergency room visits, outpatient visits, inpatient stays, health care, dental care, vision impairments, medical equipment, and prescription medications. Medical expenditures ranged from $9,507 for normal weight to $15,561 for grade II obese men. Absenteeism was assessed by how many hours the employee missed from work in the past week due to health concerns. Overweight men missed 0.5 annual workdays compared to normal weight men, whereas grade II obese men missed 5.9 more days than normal weight men. However, grade II obese women only missed 0.5 more workdays compared to normal weight women. Presenteeism was assessed by the extent to which health problems affected productivity at work. Annual
workdays lost due to presenteeism significantly increased for each weight category (6.3 days for overweight, 11 days for obese I, and 22.7 for obese II). The total cost of full-time overweight, obese I, and obese II employees’ medical expenditures, absenteeism, and presenteeism for employees was $73.1 billion dollars per year. However, the authors did not provide data on the total cost of medical expenditures for employees who are in underweight and normal weight categories. Therefore, the differences in medical expenditure between normal weight and overweight/obese employees cannot be determined from this study.

Healthcare

Obese individuals are equally as likely to experience weight discrimination by health professionals as they are by strangers they pass along the street. Because health professionals, especially those specializing in obesity, Schwartz et al. (2003) suggested an implicit measure to reduce possible response bias. Teachman and Brownell (2001) presented the Implicit Attitudes Test (IAT) to healthcare professionals \((n = 84)\) including physicians, nutritionists, and pharmacists in attendance at an obesity continuing education meeting. The completed IAT tasks assessed stereotypes (‘motivated’ and ‘lazy’) and attitudes (‘good’ and ‘bad’) associated with the categories of thin people and fat people. Additionally, the participants completed explicit questionnaires rating beliefs about fat and thin people. Overall, the health professionals revealed a significant anti-fat, pro-thin bias on the IAT with more negative words (nasty, terrible, horrible) paired with fat people and more positive words (wonderful, excellent, joyful) with thin people \((p < .01)\). Moreover, these biases were significantly more apparent on the IAT as compared to the explicit task, suggesting that the health professionals held more negative views about
overweight individuals than they would overtly acknowledge. Finally, the authors compared the data from the health professionals to a previous sample of members of the general population. Although health professionals demonstrated an anti-fat bias, it is not as strong as the general population. The results of this study appear to indicate that health professionals working with obese individuals have implicit negative perceptions of obese individuals, but these perceptions are not as extensive as the general population.

Schwartz et al. (2003) replicated Teachman and Brownell’s (2001) design with healthcare professionals attending an obesity conference. The 389 participants included physicians, researchers, businessmen, pharmacologists, epidemiologists, psychologists, and other obesity clinicians. According to IAT responses and explicit attitudes surveys, participants significantly associated “bad, lazy, stupid, and worthless” more frequently with overweight than thin \( (p < .0001) \). Women demonstrated a significant negative bias for fat people on the IAT for “lazy” and “stupid” as compared to men \( (M = 7.7, SD = 5.5; M = 5.5, SD = 6.1, \text{ respectively}) \). Younger participants revealed a significant anti-fat bias on the IAT measures of “stupid, worthless, and bad.”

Professionals who worked more directly with obese individuals had lower anti-fat ratings than those who did not work directly with obese patients \( \chi (123) = 2.5, p < .05 \). The results of healthcare professionals reporting negative perceptions of obese individuals are consistent with Teachman and Brownell (2001). The implications of this line of research is that the healthcare professionals who work directly with obese individuals may have negative perceptions of obese individuals which may interfere with the services provided to their patients.

**Education**
In educational systems, children and adolescents interact with a variety of individuals: family, peers, teachers, and school faculty (Canning & Mayer, 1967; Neumark-Stzatiner, Story, & Harris, 1999). In a classic study, Canning and Mayer (1967) investigated if obesity influenced high school academic performance. Data were collected on participants’ intelligence quotient, Preliminary Scholastic Aptitude Test (PSAT) score, Scholastic Aptitude Test (SAT) score, grade rank, absences from school, visits to the school nurse, extracurricular activities, and future school plans for 1,072 high school seniors in the suburban Boston area. Based on an anthropometric measurement of the triceps, 432 participants were identified as non-obese males, 81 obese males, 452 non-obese females, and 96 obese females. Chi-square analyses and t tests were conducted between groups on each variable. The groups did not significantly differ on any of the variables ($p > .05$). The investigation provided preliminary data that there were no significant differences between obese and non-obese participants on intelligence, aptitude, and health. However, the data were limited by socioeconomic status and region, as the results may not generalize to urban and rural communities.

School faculty is exposed to and interacts with diverse students (Neumark-Stzainer, Story, & Harris (1999). Negative perceptions of overweight and obese students by school faculty have a variety of implications. For instance, a letter of recommendation may be influenced by the student’s weight rather than academic merit. Moreover, evaluations of a student’s behavior may be biased due to the student’s weight. Neumark-Stzainer, et al. (1999) investigated school faculty’s beliefs and attitudes about obesity, personal weight issues, and support for school programs targeting childhood obesity. One hundred fifteen predominantly Caucasian school nurses, social workers, and teachers
participated in the study. The overall mean BMI of participants was in the average range, with a BMI of 27.6 for males and 25.5 for females. Participants’ beliefs about obesity, such as obesity being controllable, and attitudes (positive and negative) towards obese individuals were measured. Participants responded to questions that assessed if they were currently trying to lose, gain, or maintain their weight. It was hypothesized that personal BMI and weight-related issues may impact the participants’ weight and attitude beliefs. Participants’ beliefs about obesity indicated that they believed obesity is caused by problematic eating behavior or as a result of genetics. Sixty-six percent of participants endorsed that obese individuals have problems with self-image and are self-conscious about their bodies. Neither participants’ BMI nor weight-related issues had an impact on their beliefs ($r = -.01, p = .16$) or attitudes ($r = -.07, p = .29$). Finally, attitudes and beliefs were not significantly related to participants’ support for school programs about obesity ($p > .05$). The authors suggested that school faculty are knowledgeable as to the causes of obesity and may be empathic towards the self-image and self-conscious issues faced by overweight students.

**Adolescent Friendships**

Childhood obesity can interfere with friendships and relationships throughout development (Eisenberg, Neurmark-Stzainer, & Story, 2003; Renna, Grafova, & Thakur, 2008; Strauss & Pollack, 2003). An examination of social networks is a method to explore social relationships in adolescents (Renna, Grafova, & Thakur, 2008; Strauss & Pollack, 2003). When analyzing social networks, Strauss and Pollack (2003) hypothesized that overweight and obese adolescents have fewer friendships and are less popular than normal-weight children. In friendship network research, participants
reported their height, weight, five best male friends, and five best female friends. BMI was calculated from the reported height and weight. Matrix analyses were conducted to determine the popularity of a participant in social networks, which was measured by the number of friendship nominations he or she received from other participants. The authors conducted matrix analyses on friendship nominations that were reported among 7th to 12th grade students enrolled in the 1994 National Longitudinal Study of Adolescent Health (Add Health) \((n = 110,880)\), which was representative of adolescents in the United States. Overweight students \((\text{BMI} \geq 25; n = 1,852)\) were significantly less likely to receive friendship nominations than normal weight participants \((p < .001)\). Moreover, participants who nominated overweight students as friends were significantly less likely to receive friendship nominations than other students. The examination of friendship nominations revealed that overweight students had fewer reciprocal friendships and were not as popular as their normal-weight peers. However, the authors of this study failed to separate all of the BMI categories in analyses, which makes it unknown if the friendship networks of overweight adolescents are different from obese adolescents.

Renna, Grafova, and Thakur (2008) used the same methodology as Strauss and Pollack (2003) to further analyze the 1994 Add Health data \((N = 2,391)\) and examine the correlations between personal BMI and the BMI of friends. The average BMI of the sample was 22.5. A major finding was that the BMI of a participant was positively correlated with the BMI of his or her friends. For all participants, a six-point increase in a friends’ BMI was associated with a one-point increase in the respondents’ BMI \((p < 0.01)\). Race and family members’ BMI was more predictive of the respondent’s BMI then the BMI of his or her friends. Although adolescence is a time when peer
acceptance appears crucial in impacting behavior, cultural and parental influences may impact adolescents' weight and friendships.

Overweight adolescents are likely to experience social stigmatization from their peers at school, which can possibly lead to emotional problems, poor self-esteem, and problematic eating behaviors (Neumark-Sztainer, Story, & Harris, 1999). For example, Eisenberg, Neumark-Sztainer, and Story (2003) explored the associations between emotional well-being and being teased about weight during adolescence. The authors hypothesized that weight-related teasing has a negative impact on body satisfaction and self-esteem while increasing depressive symptomology and suicidal ideation and attempts. The 4,746 participants enrolled in middle schools and high schools throughout the Minneapolis area that participated in Project EAT (Eating Among Teens) completed the survey. The sample consisted of approximately an equal number of boys and girls with two thirds enrolled in high school. Nearly half of the sample was Caucasian and either from middle or upper middle socioeconomic status. The emotional well-being survey included items addressing body-dissatisfaction, depressive mood, suicide ideation, suicide attempts, and weight-based teasing by friends and family. Weight-based teasing occurred for both adolescent boys and girls from family members (28.7% girls, 16.1% boys), friends (30.0% girls, 24.7% boys), and from both family members and friends (14.6% girls, 9.6% boys). On all measures of emotional well-being, all individuals who were teased about their weight had significantly more problems than adolescents who were not teased. Moreover, those who were teased by both family and friends had even greater emotional-well being problems than those who had been teased by only family or friends. Girls who were teased about their weight were twice as likely to contemplate
suicide than girls who were not teased, with 25% of the girls making a suicide attempt.
Among boys, teased adolescents were three times more likely to attempt suicide than
those who had not been teased about weight. Personal weight, socioeconomic status, and
ethnicity were not significantly correlated with either the frequency of teasing or well-
being of participants. In regards to personal weight, this finding reveals that teasing
about weight, not weight itself, is what impacts emotional well-being. Overweight and
obese adolescents are often targets of teasing because of their weight. These teasing
behaviors are then correlated with greater suicide attempts and decreased emotional well-
being (Eisenberg, et al., 2003).

Sexuality

Pubertal development leads to changes in girls’ bodies. One typical change is an
accumulation of body fat throughout the body. Because physical appearance is an
important quality in adolescence, the addition of body fat can lead to problems for girls.
Halpern, Udry, Campbell, and Suchindran (1999) collected self-report data on weight,
height, dieting behaviors, sexual activity (coital activity and petting), and the importance
of being attractive and having a boyfriend from Black and White girls enrolled in the
seventh and eighth grades. Distribution of fat was taken by skinfold measures at the
biceps, triceps, subscapular, and suprailliac. Breast size, pubic hair development, leg hair,
auxiliary hair, and a rating of body curviness were taken as measures of pubertal
development. In regards to pubertal development, Black females experienced menarche
earlier and had significantly higher pubertal development scores than White females.
White females (85%) rated having a boyfriend as significantly more important than Black
females (70%) and the importance of having a boyfriend increased with age. Body
weight was not correlated with the importance of having a boyfriend. All participants emphasized the importance of being physically attractive. Body weight was negatively correlated with dating activity. For example, a White female who weighed 110 pounds was twice as likely to date than a girl that weighed 126 pounds and three times more likely to date than a girl who weighed 140 pounds. Body fat was uncorrelated with coital activity and petting activity in Black females. For White females, body fat was unrelated to coital activity, but had a negative correlation with petting activity. Overall, seventh and eighth grade girls may be more likely to engage in petting than coital activity. Taking into account that heavier girls are less likely to have dates, it is possible they have fewer opportunities to engage in petting activities. In adolescence, physical attractiveness and having a boyfriend were important qualities for most participants in the sample. Fat distribution was negatively correlated with dating behavior and is associated with less frequent sexual activity.

**Mate Selection**

Several psychological theories propose explanations for human mate selection (Carmalt, Cawley, Joyner, & Sobal, 2008; The & Gordon-Larsen, 2009). Assortative mating highlights that people select partners who are similar to their own characteristics, behaviors, and body shapes (The & Gordon-Larsen, 2009). Physical attractiveness is another attribute that is often considered for mate selection (Carmalt, et al. 2008). Similarity matching occurs when the couple consists of two partners who have equivalent physical attractiveness ratings. The exchange theory of mate selection incorporates aspects of assortative mating and similarity matching. In the exchange theory of attractiveness, individuals may select a partner of lower physical attractiveness then
themselves if the potential mate has other desirable traits including personality characteristics, intelligence, and financial resources (Carmalt, et al., 2008).

Carmalt et al. (2008) analyzed the third wave of the romantic pair data (2001-2002) from Add Health to examine partner ratings of physical attractiveness. Adult dating, cohabitating, and married heterosexual partners ($N = 1,507$) completed self-reports on the physical attractiveness of him or herself and his or her partner, the partner’s hygienic grooming, personal income, cognitive ability, personality attractiveness, and emotional supportiveness. Physical attractiveness was measured by the question, “How physically attractive is the respondent?” After controlling for personal attractiveness, grooming, education, cognitive abilities, and attractive personality, obese women (BMI $\geq 30.0$) had 28% lower odds ($1 -.72$) of having a physically attractive partner than healthy weight participants (BMI 18.5 – 25.0). Obese men had 25% lower odds of having a physically attractive partner than healthy men. However, physical attractiveness was only measured by the question, “How physically attractive is the respondent?” This question reflects subjective perceptions of attractiveness on an individual basis. Therefore what one participant may perceive as physically attractive may not be physically attractive to another participant. Another explanation is that obese individuals are more accepting of other individuals and different degrees of attractiveness. This result was also discovered by Aruguete, Edman, and Yates (2009) when college students were instructed to indicate their preferences for 12 characteristics of a romantic partner. In this investigation, non-obese ($n = 1,071$) participants were significantly more selective in romantic partner selection than obese
(n = 146) participants [F (1, 1118) = 6.01, p < 0.5]). Again, these results may reflect a more accepting attitude of others by obese participants compared to normal weight participants. Carmalt et al. (2008) included only opposite-sex partners, which leaves the question of whether the results would generalize to homosexual couples. The current literature has not included homosexual couples in this area of research. Generalizability is also limited due to the predominantly Caucasian sample.

Relationship Satisfaction

The relationship between obesity and relationship quality can be examined with four theoretical models (Sobal, Rauschenbach, & Frongillo, 1995; The & Gordon-Larsen, 2009). The family function theory originates from a family-systems-model. According to this theory, the obese family member serves a function in the family. Various interactions occur among family members and one member’s weight status may impact his or her relationship with others. For example, a husband may try to sabotage his wife’s attempt to lose weight so that she does not appear more desirable to other men in society (Sobal et al., 1995). The shared household environment theory suggests that individuals living in the same home are likely to engage in the same behaviors. Therefore, they may consume the same food, share dieting habits, watch the same television programs, and engage in similar physical activities (The & Gordon-Larsen, 2009). Social norms theory maintains that the stigmatization obese individuals experience in society is likely to occur from their loved ones at home. For example, Sheets and Ajmere (2005) found that 31.7% of their 554 college participants received weight-related comments from their partners, such as being told to lose weight. Finally, the marital exchange theory states that reciprocal exchanges occur among people. If and
when obese individuals accept their stigmatization and lower status in society, they may have lower standards in mate selection (Sobal, et al., 1995).

Boyes and Latner (2009) investigated the association between BMI and relationship quality in 57 dating/married college couples. According to the BMI of female participants, 3.5% were underweight, 73.7% were normal weight, 15.8% were overweight, and 7% were obese. The distribution of male BMI was 45.6% normal weight, 49.1% overweight, and 5.3% obese. The participants completed measures that assessed the quality of their relationship, relationship stability, self-perceived mate value, partner mate value, and their partner’s ideal standards in warmth/trustworthiness, attractiveness/vitality, and status/resources. A negative correlation was found between relationship quality and higher BMI in women \( (r = -.29, p < .05) \). In relationship stability (the likelihood of the relationship ending), women with higher BMIs were more likely to believe their partners would end the relationship \( (r = .30, p < .05) \). There were no associations between men’s perceptions of their partners and their partner’s BMI. Men rated heavier women significantly less likely to be their ideal partner \( (r = -.27, p < .05) \). The authors suggested the negative correlations between women’s BMI, quality of relationship, and relationship stability emphasizes that overweight women may endorse negative beliefs that they are not worthy to be in relationships. However, the effect sizes in the study ranged from small to moderate \((- .26 \text{ to } .56)\), which suggests that the significance of the statistical tests should be interpreted with caution. Also, the study was only conducted on a college sample. The study would have to be conducted on older adults to determine if these results generalize to married couples who typically have been together for more years than the college sample.
Relationship satisfaction occurs in general interpersonal domains, not solely partnered relationships (Carr & Friedman, 2006). For instance, people can share quality and meaningful relationships with friends and coworkers. Carr and Friedman (2006) analyzed data from the 1955 wave of the Midlife Development Survey in the United States to explore the relationship between self-reported body weight and interpersonal relationships. The nationally representative sample consisted of English-speaking adults from ages 25 to 74 who completed a mailed questionnaire on social relationships (N = 3,656). BMI of participants was classified into five categories: underweight (BMI < 18.5), normal weight (BMI 18.5 – 24.9), overweight (BMI 25.0 – 29.9), obese (BMI 30.0 – 34.9), and very obese (BMI ≥ 35.0). Dependent variables consisted of questions that assessed positive/supportive and negative relationships participants had with friends, coworkers, spouses, and family members. BMI was the main independent variable for analyses. Also, variables that are likely to impact body weight (age, sex, race, marital status, parental status, socioeconomic status, education, physical health, and emotional health) were controlled in the analyses. Emotional health included six items that assessed anxiety, depression, hopelessness, and worthlessness. Recalled youth (age 21) weight was included as a moderator variable as to how it might influence the trajectory of an individual’s relationships over time. Bivariate analyses found that obese participants reported significantly more negative relationships with friends and family members than normal-weight participants (p < .05), but there were no significant differences in their relationships with spouses or coworkers. Participants with an underweight BMI had significantly lower positive relationships with their spouses than normal-weight participants (-.31 vs. -.03, p ≤ .05). While 96% of currently normal-weight
participants reported normal-weight in their youth, 56% of obese and 37% of very obese participants reported they were normal weight at age 21 \( (p \leq .001) \). There was no longer a significant relationship between obese weight status and negative relationships with friends and family after controlling for age, sex, race, marital status, parental status, socioeconomic status, education, physical health, and emotional health. This analysis reflects the importance of other variables impacting the quality of relationships. For example, a mood disorder may impact the quality of relationships an individual experiences. The results of the study should be interpreted with caution because the social surveys that were completed only consisted of 10 questions. Ten questions may not provide an adequate amount of data to demonstrate significant differences in interpersonal relationships based on weight status. Moreover, a major concern of self-report data is reporting bias in which individuals may be reluctant to report their true weight or are not accurate reporters of their true weight so BMI categories may not be accurately classified. Also, it would seem difficult for older adults to accurately report their youth weight.

Assessment of Body Shape and Body Image

In the body shape literature, participants are presented with a range of body figures and may be asked to identify the figure that best represents their current size, ideal size, the figure that the opposite sex would find most attractive, and the figure of the opposite sex they find most attractive (Fallon & Rozin, 1985; Ferraro, et al., 2008; Rozin & Fallon, 1988). Body shape figures are designed through silhouettes or line drawings (Counts & Adams, 1985; Fallon & Rozin, 1985; Kirkpatrick & Rinn, 1986; Thompson & Gray, 1995; Thompson & Psaltis, 1988; Tucker, 1984). In silhouette designs,
participants are presented with black silhouettes that outline the figure of a man or
woman (Burec, Papageorigis, & Solymon, 1984; Counts & Adams, 1985; Kirkpatrick &
Rinn, 1986). Line drawing scales are more prevalent in the body shape literature and
over 20 different scales have been developed (Thompson & Gray, 1995). Line drawing
scales have been developed to change the ratio of fat distribution in the torso and limbs,
alter breast size, and determine the effects of dorsal and lateral views on body perception
Although 20 different stimuli scales have been developed, only three of these scales have
demonstrated reliability and validity (Thompson & Gray, 1995). The Body Image
Assessment (BIA) (Thompson & Gray, 1995, Stunkard’s Figure Rating Scale (Thompson
& Altabe, 1991), and Contour Drawing Rating Scale (Wertheim, Paxton, & Tilgner,
2004) are widely employed and have approximately equal reliability and validity
(Ambrosi-Randic, Porkajac-Bullian & Taksic, 2005; Bulik, Wade, Heath, Martin,
Stunkard, & Eaves, 2001; Fingeret, Gleaves, & Pearson, 2004; Silberstein, Streigel-
Moore, Timko, & Rodin, 1988; Williams, Gleaves, Cepeda-Benito, Erath, & Cororve,
2001).

In Stunkard’s Figure Rating Scale, The Body Image Assessment (BIA), and the
Contour Drawing Rating Scale, participants are presented with nine female and nine male
figures. The participants are instructed to identify the figure that best represents their
current size, ideal size, the figure the opposite sex would find most attractive, and the
figure of the opposite sex that the participant finds the most attractive (Fallon & Rozin,
1985; Thompson & Gray, 1995; Williams, et al., 2001). (Silberstein et al., 1988;
Thompson & Altabe, 1991). Each of the three scales consists of nine stimuli, but there
are differences in the distribution of body shape within these measures (Stunkard, Sorensen, & Schulsinger, 1983; Thomspson & Gray, 1995; Williams et al., 2001). For example, Stunkard’s Figure Rating Scale includes a greater proportion of overweight and obese figures, whereas the Contour Drawing Rating Scale consists of more thin figures (Stunkard, Sorensen & Schulsinger, 1983; Thompson & Gray, 1995). When these scales are used as measures of body image (i.e., current size, ideal size), participants rarely select the stimuli at the ends of the continuum of the figures and are more likely to select figures in the center of the continuum (Ambrosi-Randic, et al., 2005; Bulik, et al., 2001; Fallon & Rozin, 1985; Thompson & Gray, 1995).

Taking into account that participants frequently select the figures in the middle of the continuum, Ambrosi-Randic et al. (2005) investigated whether the number of stimulus figures contributed to differences in participants’ current and ideal ratings. The Contour Figure Drawing Rating Scale was presented to 320 female undergraduate participants with either stimulus fields of three, five, seven, and nine female figures. Ratings for ideal size on a stimulus of field of three figures were significantly different than for fields of five, seven, or nine figures. However, there were no significant differences for ideal size when additional figures were included in the stimulus field. When current body shape ratings were compared, there were significant differences between the field of three figures with five and nine figures. For ideal sizes, significant differences emerged between three figures and all other stimulus fields. There were no significant differences among the varying stimulus fields in ratings of body dissatisfaction (current – ideal figure). A reason that the ratings for the stimulus field of three figures varied from the other fields is that the stimulus field of three contains the
thinnest, middle, and largest figures. Therefore, participants were forced to select either
the extreme figures of the continuum or the middle, which gave the participants limited
choice selections. Also, the figures at both ends of the continuum were rarely selected in
fields that consisted of more than three figures. Although the extreme figures are rarely
selected, they provide participants with poles on the body shape on the continuum. The
implications of the investigation is that all nine figures do not need to be included in the
stimulus figure because the ratings of five, seven, and nine figure were about equal.
Additionally, the figures on the extremes of the continuum would be most effective to
remove because participants rarely selected these figures in their ratings.

**Stunkard’s Figure Rating Scale**

Stunkard’s Figure Rating Scale is a widely employed measure in body shape
research (Fallon & Rozin, 1985; Ferraro, et al., 2008; Rozin & Fallon, 1988). Stunkard’s
Figure Rating Scale consists of eighteen silhouette figures of nine men and nine of
women. The figures are positioned on a continuum from “very thin” to “very obese.”
(Stunkard, Sorensen, & Schulsinger, 1983).

In a typical body shape investigation, Fallon and Rozin (1985) investigated
college participants’ \((n = 475)\) perceptions of body shapes and what they perceived to be
the most attractive figure for their sex, the opposite sex, and what figure of their sex
would be most attractive for the opposite sex. The participants evaluated the male and
female Stunkard figure drawings ranging from very thin to very heavy (Stunkard,
Sorensen, & Schulsinger, 1983). Participants were instructed to indicate which figures
reflected their own body shape, their ideal shape, the body shape that is most appealing to
the opposite sex, and the body shape of the opposite sex that was most attractive. The
results revealed that compared to men, women significantly overestimated their current body shape. Also, women's current shape was significantly higher than their ideal shape. Moreover, women's ideal shape was significantly smaller than the shape that men selected to be most attractive for women. Men's ratings of their current body shape, ideal shape, and most attractive shape were not significantly different. The results indicated that men are generally satisfied with their bodies, but women idealize a smaller shape and believe that men prefer smaller female bodies. Thompson and Psaltis (1988) replicated the design of Fallon and Rozin (1985) and found the same results providing additional support for the difference in body satisfaction between men and women.

Cultural influences may also impact perceptions of body shapes. Bhuiyan, Gustat, Srinivasan, and Bereson (2003) researched differences in body shape perceptions among White and Black men and women. Young adults \( M_{age} = 27.6 \) enrolled in the Bogalusa Heart Study \( N = 3,698 \) were presented with Stunkard's Figure Rating Scale (Stunkard, Sorenson, & Schulsinger, 1983) to assess perceptions about their current body shape. A body image discrepancy (BID) score was calculated to determine the difference between participants' actual BMI, calculated by self-reported weight and height, and the body shape they selected to represent themselves on the Figure Rating Scale. Of the participants, Black females had the highest BMI scores \( M = 27.1 \), whereas White females had the lowest BMI scores \( M = 24.2 \). Black participants had significantly lower income, spent less time enrolled in school, and were less likely to be employed compared to White participants \( p < .001 \). The analysis of BID scores revealed that Black participants perceived their body shapes to be smaller than their actual BMI, whereas White participants perceived their body shapes to be larger than their BMI. \( p < \)
A limitation of self-reporting weight is that participants may not accurately report their true weight or feel uncomfortable reporting their weight. For examples, Whites may have overestimated their weight and Black underestimated their weight. Misreporting weight would influence the accurate classification of BMI categories. The study failed to find sex differences and sex-gender interactions of how individuals perceive body shapes.

One limitation of Stunkard’s Figure Rating Scale is that the stimulus figures employed with middle-aged or older adults are often the figures employed with younger samples (Rozin & Fallon, 1998). However, the body shapes of undergraduate students and older adults are most likely different. Ferraro et al. (2008) implemented figure drawings that were similar to the body shapes of older adults. The older participants (n = 52; $M_{age}$ female=71.2, $SD = 8$; $M_{age}$ male=72.2, $SD = 10$) in the study rated male and female rated figures on social acceptability, ideal size, attractiveness, the body shape they wished to be, current body shape, and the figure they preferred the best. The line drawings consisted of 81 figures ranging from very thin to very obese in five age categories (babies, children, young adults, middle-aged adults, older adults). Older women rated a significantly smaller female figure attractive than did men. As compared to older men, older women selected significantly smaller figures for the most attractive, socially acceptable shape, and preferred body shape ($p < .02$). In addition, the women indicated that their current body shapes were larger than what they preferred whereas men were content with their body shapes ($p = .03$). The results provided evidence that body shape concerns in women continue through young adulthood into older adulthood and are consistent with research using college undergraduates (Fallon & Rozin, 1985). The results of the study are limited due to the use of a Caucasian convenience sample that
consisted of retired faculty members of the college and local community members. Also, female participants' selection of small figures may represent a desire to stay or become healthy as they age. The results of older adults parallel the results of Fallon and Rozin (1988) in which parents of undergraduate students (n = 94; M male age = 50.3; M female age = 46.5) rated the Stunkard Figure Rating Scale images. The women in the studies selected a smaller ideal shape, and attractive female shape than did men (p < .001). Across different developmental periods (young adulthood, middle age, older adulthood), female participants selected a small figure as the ideal and most attractive image (Fallon & Rozin, 1985; Ferraro et al., 2008; Rozin & Fallon, 1998). Female ratings on the Stunkard Figure Rating Scale may represent a woman's desire for a smaller body shape or it may reflect the need to stay fit and healthy.

**Waist-to-Hip Ratio**

Evolutionary psychology contends that one reason for female mate selection is based on her capacity for reproduction and health (Singh, 1993). Waist-to-hip ratio (WHR) is a measure of body fat distribution that accounts for these factors. The formula for WHR measures the waist at its narrowest point divided by the hip at its greatest extension with the buttocks. The average range for WHR in adult females is between 0.67 and 0.80, which is consistently lower than a male's WHR (0.85-0.95) (Singh, 1993). Qualities that are associated with a WHR in the average range are fertility, health, youthfulness, and attractiveness (Furnham, Tan, & McManus, 1997). For example, a slight increase in WHR (0.1 unit) is correlated with a 30% decrease in the probability of conception (Singh, 1993). From an evolutionary perspective, the critical component of
WHR is that a woman in the WHR average range reflects fertility, which will promote the continuation of the species.

Furnham, Tan, and McManus (1997) investigated the role of WHR and weight categories on ratings of attractiveness, youthfulness, sexiness, healthiness, and reproductive capabilities. The stimuli consisted of 24 stimuli (12 male, 12 female) manipulated by WHR (0.7, 0.8, 0.9, and 1.0) and weight status category (underweight, normal, and overweight). For example, there would be stimuli of a normal weight woman with 0.7, 0.8, 0.9, and 1.0 WHR. The male and female college participants \((n = 90)\) ranked the five attributes on an opposite ending scale (i.e., healthy vs. unhealthy). Participants rated the normal weight male and female stimuli most attractive and the overweight stimuli least attractive \((p < .01)\). Men with a WHR of 0.9 or 1.0 and females with a WHR of 0.7 were rated the most attractive. A significant effect was found on ratings of healthiness in that overweight male figures were and underweight female figures were rated the unhealthiest \([F(2,176) = 7.152, p < .0001]\). Overall, healthiness ratings decreased as WHR increased. Different ratings emerged for youthfulness whereby underweight males with a WHR of 0.9 and normal weight females of 0.7 of 0.8 received the highest ratings. The study revealed an undifferentiated sex preference for normal weight bodies as well as preferences for high WHR in males and average WHR in females.

By altering the size of the stimulus' torso in WHR designs, the BMI of the stimulus is also altered (Swami, Neto, Tovee, & Furnham, 2005; Swami & Tovee, 2007). The changes in BMI may influence attractiveness and youthfulness ratings more than WHR. For example, preferences for a low WHR female may in fact be attributed to a
preference for a lower BMI and smaller physique (Swami, et al., 2007). The effects of BMI and WHR may interact when rating stimuli on youthfulness and attractiveness (Furnham, Petrides, & Constantinides, 2005). Furnham, Petrides, and Constantinides (2005) investigated the additive and interactive effects of WHR and BMI on ratings of attributes. Undergraduate students ($n = 102$, $M$ age $= 18.66$, $SD = 3.06$) were presented with 18 female stimuli, which represented a 5'6'' female, of varying WHR (0.6, 0.7, 0.8, 0.9, 1.0, and 1.1) and BMI ranges (underweight, normal, and overweight). In addition to WHR, fat distribution was manipulated in the stimuli’s limbs. For example, overweight figures had a greater fat distribution in their arms and legs than underweight or normal weight figures. Stimuli were rated for seven attributes (healthy, fertile, youthful, intelligent, nurturing, flirty, and attractive) on a likert scale. Results revealed significant multivariate effects of WHR [Wilks’ lambda (35,66) $= 9.68$, $p < .01$; partial eta squared $= 0.14$] and weight [Wilk’s lambda (14,87) $= 40.30$, $p < 0.01$; partial eta squared $= .52$] on the seven attributes, as well as an interaction between the variables [Wilks’ lambda (70,31) $= 6.04$, $p < 0.01$; partial eta squared $= .07$]. The effects of BMI were stronger than WHR on the attributes. Effect sizes were greater for BMI than for WHR on many variables: attractive (0.52 vs. 0.35), youthful (0.45 vs. 0.27), and flirty (0.42 vs. 0.27). When taking into account both BMI and WHR, BMI had greater effects on the ratings of attributes than WHR, suggesting that overall weight status is more predictive of attractiveness and youthfulness ratings that WHR. Although BMI and WHR interacted on ratings of the seven attributes, BMI accounted for more of the variance. This finding undermines the evolutionary psychology theory because WHR did not predict attractiveness and youthfulness ratings as much as BMI (Singh, 19939). A
limitation of the study is that in an attempt to separate the effect of BMI and WHR, the addition of fat distribution to the stimuli’s limbs may have either complicated or improved the study because WHR traditionally does not account for fat distribution outside of the torso (Singh, 1993; Swami et al., 2007; Swami & Tovee, 2007).

Breast size is another variable that is overlooked in WHR studies (Cohen & Tannenbaum, 2001; Furnham, Swami, & Shah, 2006). Furnham, Swami, and Shah (2006) manipulated breast sizes (large or small breasts) in addition to WHR (0.6, 0.7, 0.8, 0.9, 1.0, and 1.1) and body weight (underweight, average weight, and overweight), which resulted in a field of 36 different stimulus figures. Moreover, legs and arms were thickened or narrowed based on body weight as used by Furnham et al. (2005). Male and female college participants \( n = 185 \) rated each of the 36 figures on attractiveness, healthiness femininity, and reproductive capacity. WHR and BMI both significantly affected the ratings of attributes. WHR had a significantly greater effect size than BMI: femininity (0.44 vs. 0.29); physical attractiveness (0.53 vs. 0.31); healthiness (0.46 vs. 0.22); reproductive capacity (0.34 vs. 0.14). In general, large breast size increased positive ratings on the four variables \( p < .01 \). Breast size did not have a significant impact on ratings, but did interact with WHR. For small breast size, a WHR of 0.6 or 0.9 in the underweight or average weight stimuli and the 0.9 WHR of the overweight stimuli had the highest ratings on all four variables. For large breasts, a 0.7 WHR for the underweight and average weight stimuli and 1.1 WHR for the overweight stimuli had the highest ratings across the four variables. Among the four attributes, a 0.6 WHR had the highest rating of femininity, 0.9 WHR for physical attractiveness, and 0.8 WHR for health and reproductive capacity. Sex differences emerged reflecting that male
participants rated the 0.6 WHR the most positive and preferred smaller breasts whereas females preferred a 0.8 WHR and larger breasts. Body weight and WHR inform us of preference ratings, but breast size is another key variable on ratings of female figures. BMI, WHR, and breast size are observable aspects of the female body that may be incorporated to assess rating figures. However, combining WHR, BMI, and breast size into a single design makes it difficult to separate the influences of each of these body measurements.

**Antifat Attitudes**

Cultural values are likely to impact perceptions of individuals’ weights. American Protestant values of discipline, self-reliance, and self-control may influence attitudes towards overweight and obese people (Crandall, 1994). The Antifat Attitudes Questionnaire (AAQ) is comprised of 26 statements about fatness that are rated on a Likert Scale (Crandall, 1994). A pilot study was conducted on 251 male and female undergraduate students. A factor analysis of responses to the questionnaire resulted in three factors: Dislike, Fear of Fat, and Willpower. The Dislike factor (eigenvalue=3.6) represents a general aversion for fat people. *I really don’t like fat people much, Fat people make me feel uncomfortable,* and *If I were an employer looking to hire, I might avoid hiring a fat person* are a few items that comprise the scale. The Fear of Fat factor (eigenvalue = 2.1) represents worrying about gaining weight and self-hatred for gaining weight. The final factor, Willpower (eigenvalue = 1.9), evaluated the extent that individuals have control over their weight with items including *Some people are fat because they have no willpower and Fat people tend to be fat pretty much through their own fault.* Willpower and Dislike were positively correlated (*r* = .43, *p* < .001)
reflecting an association between the belief in self-control to maintain weight and dislike of fat people.

Cultural values are likely to affect one's antifat attitudes (Carndall & Martinez, 1996). For example, North Americans view overweight individuals as having a lack of self-control and being responsible for their size. In countries such as Mexico, values of self-control and self-determinism are not as pervasive as in the United States. Therefore, cultural differences may occur in antifat attitudes. Samples of undergraduate students in the United States \( (n = 170) \) and Mexico \( (n = 236) \) were compared on surveys assessing antifat attitudes, belief in a just world, and the belief that poverty is due to what poor people can and cannot control. The authors hypothesized that Americans would endorse greater antifat attitudes and beliefs in a just world than Mexican participants. North American participants had a significantly stronger dislike for fat people than did Mexican participants \( (t = 2.45, p < .015; d = .25) \). Also, North American participants believed that individuals should have more willpower over their weight than Mexican participants \( (t = 2.44, p < .015; d = .25) \). Female participants had a greater fear of fat than males, with this effect being strongest for North American females \( (t(249) = 5.45, p < .001; d = .67) \). Mexican participants reported a significantly lower belief in a just world than North American participants \( (t(372) = 6.77, p < .001; d = .67) \). The American sample was more likely to blame the poor for their conditions than Mexican participants suggesting a strong belief in self-determination and individualism, which are staples of American culture. American values highlight the importance of an individual being in control of his or her life, which may contribute to overweight and obese individuals being held personally accountable or their body size.
An advantage of the Antifat Attitudes Questionnaire is that it relies on attitude statements that are easily evaluated by participants. Because it is an explicit measure, face-validity allows participants to know exactly what is measured (Crandall, 1994). A major limitation of the AAQ is the manner in which it was developed. Because the AAQ explores American values, responses may reveal general cultural beliefs rather than a personal preference for thinness or fatness. Another limitation is that individuals have different conceptualizations of what is considered “fat.” For example, one person may consider an obese individual fat whereas a relatively skinny woman who gained five pounds may consider herself fat. Therefore, the term “fat” may elicit different images for different individuals, which means that participants are not using the same standard image to denote fatness and complete the AAQ.

**Implicit Attitudes**

The negative attitudes that individuals hold against overweight and obese people may be at an explicit level, implicit level, or both. Explicit attitudes are those beliefs people are aware of and acknowledge. Conversely, implicit attitudes are removed from consciousness and tap into what individuals may be unwilling to admit. (Schwartz, Vartanian, Nosek, & Brownell, 2006). The Implicit Attitude Test (IAT) detects the response latency of how long it takes participants to make an association between a pair of concepts (“thin,” “overweight”) and a pair of attributes (“good,” “bad”). The latency period is expected to reveal the strength of the association with a short latency period taken as evidence of a strong association between concept and attribute. For example, a strong association occurs if there is a short latency period (Schwartz, et al., 2006; Teachman & Brownell, 2001; Teachman, et al., 2003). For example, a quick association
between “thin” and “good” represents a strong association between concept and attribute. The premise of the IAT task is that the automatic associations between concepts and attributes occur so quickly that possible response biases are limited. Therefore, participants are not provided time to evaluate their associations and respond in a socially acceptable manner (Schwartz, et al., 2003; Schwartz, et al., 2006; Teachman & Brownell, 2001, Teachman, et al., 2003). Also, explicit measures are often included in IAT designs to determine if there are differences in how participants respond on explicit and implicit tasks (Schwartz, et al. 2006; Teachman, et al., 2003). Individuals report significantly greater negative associations between attributes and overweight bodies on the IAT than explicit measures (Schwartz, et al. 2003; Teachman, et al., 2003).

Schwartz, Vartanian, Nosek, and Brownell (2006) researched anti-fat attitudes on implicit and explicit levels in adult participants from the United States, Britain, Canada, Australia, and other countries (N = 4,283). The mean BMI for participants was 29 (overweight) with 3% of the sample underweight (BMI<18.5), 41% normal weight (BMI 18.5 - 24.9), 21% overweight (BMI 25.0 - 29.9), 21% obese (BMI 30.0 - 39.9), and 14% extreme obese (BMI ≥ 40.0). The IAT was employed to measure implicit attitudes. For the first IAT task, participants paired concepts (“slim,” “overweight”) that represent thin and overweight bodies with the words “good” or “bad.” For the second IAT task, participants paired different attributes (“lazy,” “motivated”) with the concepts. In final IAT task, the attributes were changed to “anxious” and “motivated.” “Lazy” was hypothesized to be paired more often with overweight because it is a stereotypical association made with overweight individuals (Larkin & Pines, 1979; Staffieri, 1967). Another hypothesis was that “bad” would be paired more frequently with “overweight.”
On the explicit measure, participants rated items on a Likert Scale items such as, "I strongly prefer thin people to fat people" and "I strongly believe that fat people are less motivated than thin people." The researchers also explored what trade-offs participants would make instead of being overweight. Trade-offs were measured on a Likert Scale and included items such as "I'd rather be an alcoholic than be obese." The results indicated that participants associated "thin" with "good" and "overweight" with "bad" (Cohen's $d = 1.00$). As a person's BMI increased, they paired "bad" with "overweight" less frequently. However, negative implicit attitudes of "overweight" and "bad" were reported in extremely obese participants (Cohen's $d = 0.45$). Also, "lazy" was significantly associated more frequently with fat people ($p < .001$; Cohen's $d = 0.44$). These results remained even when controlling for gender, age, ethnicity, and education.

On the explicit measure, participants endorsed that fat people were lazier (Cohen's $d = 0.64$) and less motivated than thin people (Cohen's $d = 0.38$). There was a significant negative correlation between BMI and negative ratings on the explicit measure. On the trade-off measure, 46% of the participants would prefer to give up one year of life rather than be obese and 15% would give up 10 years. Twenty-five percent of participants would rather not be able to have children than be obese and 30% would rather be divorced. Considering the mean BMI of participants was in the overweight BMI range, overweight individuals made significant associations between the word "overweight" and negative attributes. Also, these individuals would be willing to give up significant life events to be normal weight rather than be obese. Considering that 56% of the sample was overweight, obese, or extremely obese, the association between "overweight" and negative attributes may reveal a desire to lose weight rather than negative beliefs.
The IAT has been employed to determine the effects of medical explanations for obesity to evoke empathy for individuals who have experienced weight discrimination, and to determine if healthcare professionals exhibit the same antifat attitudes as the general population (Schwartz, et al., 2003; Teachman, et al., 2003). Generally, participants endorse more negative associations between attributes and overweight on the IAT than explicit measures. Because of the differences between explicit measures, authors cannot determine whether the implicit attitude or the explicit attitude actually reflects the person’s overall attitude (Fazio & Olson, 2003). A strength and weakness of the IAT is the absence of stimuli figures. As a strength, participants do not make associations based on the physical appearance of a stimulus. Rather, the use of the words “fat” and “thin” permit participants to make personal assumptions about body types. However, participants vary in their beliefs as to what constitutes “fat” and “thin,” which makes it impossible to detect whether these categories are prompting the same associations across participants. For instance, an individual may associate “fat” with an overweight person while another individual may associate “fat” with an obese person. Also, the IAT may allow participants to freely report their attitudes regarding weight without endorsing blatant statements, such as “I hate fat people.” However, the short latency interval that reveals the strength association may also reflect social desirability in which the participant is attempting to appear favorably in the investigation. Furthermore, it is undetermined whether the associations made in the IAT represent if people hold different beliefs for “fat” and “thin” or if these are learned beliefs that have resulted from society’s influences. Also, the associations between “fat” and “thin” are made on a
categorical level and do not predict how individuals would perceive thin and obese people on a personal or individual basis.

Another limitation of the IAT is that it is unknown if implicit attitudes predict overt behaviors. For instance, will an individual with strong implicit antifat attitudes make negative comments to an obese person in his or her everyday environment? Mixed findings have been found with other IAT measures (Fazio & Olson, 2003; Karpinski & Hilton, 2001; McConnell & Leibold, 2001). In regards to the predictive validity of the IAT, explicit measures of antifat beliefs are proposed to predict overt acts of discrimination (blatant negative comments) whereas implicit beliefs predict spontaneous behavior (avoiding eye contact, stuttering). McConnell and Leibold (2001) found that the implicit attitudes on the IAT predicted participants’ spontaneous negative social interactions with a Black experimenter. However, participants only interacted with a Black experiments after they completed the IAT, which might have prompted the negative interactions. There was no baseline on social interactions with Black experimenters because the participants did not interact with Black experimenters before the task, so it cannot be determined if implicit associations predicted the negative behavior. In an investigation of the IAT prompting food selection, Karpinski and Hilton (2001) found that implicit attitudes (“pleasant” and “unpleasant”) for apples and candy bars did not predict participants’ choice of eating an apple or candy bar. Although the IAT is hypothesized to bypass any acknowledged attitudes and tap into unconscious beliefs, it is unclear whether the IAT predicts behavior.

Vignettes
In the vignette methodology, participants are presented with a narrative or information about a character or characters. Following the presentation of the narrative, participants rate how likely they are to engage in an activity with the character, describe the character, or determine what character best matches certain personality characteristics (Counts, et al., 1998; Cramer & Steinwart, 1998; DeJong, 1980; Hebl & Mannix, 2003; Hiller, 1981; Penny & Haddock, 2007; Swami et al., 2008). Vignette research studies have explored the relationship between weight and the likelihood of hiring job candidates, becoming friends with a visiting student at school, playing with children at school, and the extent to which medical explanations of obesity influence ratings of obese children (Counts, et al., 1998; DeJong, 1980; Hebl & Mannix, 2003; Penny & Haddock, 2007; Swami et al., 2008).

At school, children are often seen to perform in four domains: academics, athletics, art, and social interactions (Penny & Haddock, 2007). Penny & Haddock (2007) implemented a vignette methodology to determine if weight-based associations would be made with characters' performances in these domains. Five to 10 year-old children \( n = 73 \) were individually read a vignette by an examiner that consisted of two characters participating in academic, athletic, artistic, and social activities. One of the characters was good at the activity and the other was not. For example, the athletic story read, “Geoff and Ed played tennis. Geoff was good at tennis and won every game. Ed wasn't very good at tennis and didn't win any.” After the story was completed, the examiner presented the participant with a picture of two characters (one average weight and overweight) and asked who best described each character in the story. For example, the child would be instructed to “point to whom best fits Geoff.” A significant main effect
was found for the athletic domain with the overweight stimulus figure more frequently selected as the character poor in athletic ability. This result was also found for academic and artistic ability. In social ability, five to eight year-old children associated the overweight figure with poor ability, whereas nine to ten year-old children associated the overweight figure with high social ability. The stimuli of the study consisted of cartoon-like characters rather than actual children, so it was not determined whether children would make the associations with actual human figures. Also, the participants’ weight was not assessed, so it was undetermined whether personal weight influenced ratings. The advantage of the study was that the children did not see the stimulus figures until after the vignette was read, which reduced the ability for the child to make associations with stimulus figures as the vignette was read.

The advantage of vignettes is that participants are rarely presented simultaneously with the vignette and the visual stimuli of characters (Cramer & Steinwart, 1998; Hebl & Mannix, 2003; Penny & Paddock, 2007). This type of methodology provides evidence that participants may attribute negative characteristics to overweight figures without knowing about the character’s weight status. The stimulus figure itself is a weakness in vignettes. Often, authors do not provide examples of the stimulus figures or the degree of difference in weight status among the stimulus figures. Also, several of the vignette studies do not provide the weight status of the participants, so it cannot be included as a variable that may account for associations.

Adjectives

The majority of research on perceptions of body types has involved making associations between stimulus figures and adjectives (Bell & Morgan, 2000; Brylinsky &
Moore, 1994; Greenleaf, et al. 2006; Kirkpatrick & Sanders, 1978; Kraig & Keel, 2001; Lawson, 1980; Lerner, 1969; Lerner & Korn, 1972; Staffieri, 1967). Adjective studies have repeatedly revealed that negative associations are made with overweight figures (cheats, lazy, ugly, less socially active, selfish) whereas positive associations are made with thin or muscular figures (cute, nice, has more friends, kind) (Bell & Morgan, 2000; Brylinsky & Moore, 1994; Greenleaf, et al. 2006; Kirkpatrick & Sanders, 1978; Kraig & Keel, 2001; Lawson, 1980; Lerner, 1969; Lerner & Korn, 1972; Staffieri, 1967). For example, a factor analysis of the associations of adjectives with thin, muscular, and overweight figures revealed that 61% of the negative adjectives loaded on the overweight figure and 95% of the positive adjectives loaded on the muscular figure (Lerner & Korn, 1972). Also, an individual’s BMI was found to be uncorrelated to adjective associations. For example, children with a BMI in the obese range were as likely to rate an overweight figure as “lonely, lazy, ugly” and a thin figure as “honest, funny” as a child in the normal weight or overweight categories (Kraig & Keel, 2001).

In a classic investigation, Staffieri (1967) introduced the adjective methodology. Ninety-six male children aged 6-10 were presented with a stimulus field of three male figures: endomorph (heavy and round body), mesomorph (muscular body), and ectomorph (thin body). The height, head shape, and facial outline were controlled across the silhouettes. In addition to the stimulus field, the participants were presented with a list of 36 adjectives (e.g., happy, lazy, naughty, lies). The participants were instructed to make a forced-choice selection of what body shape best depicts each adjective. Chi-square analyses revealed significant differences among adjective selections in that the mesomorph figure received significantly more positive adjectives than did the endomorph
or ectomorph figures ($p < .001$) and the endomorph figure received significantly more negative adjectives than the mesomorph or ectomorph figure ($p < .01$). Also, the participants wanted their bodies to be most like the mesomorph figure ($p < .01$).

The Staffieri (1967) study presents the basic adjective methodology. The methodology has been expanded to use underweight and normal weight figures (Brylinsky & Moore, 1994; Greenleaf, et al., 2006; Kraig & Keel, 2001) and an adjective continuum (i.e. cute/ugly, or somewhere in the middle) (Brylinsky & Moore, 1994). However, the adjective methodology suffers from two major limitations. First, several of the investigations only use male stimuli (Lerner, 1969; Lerner & Korn, 1972; Staffieri, 1967). Moreover, when female stimuli are implemented, participants only rate the stimuli of their personal gender meaning that males rate male stimuli and females rate female stimuli (Brylinsky & Moore, 1994; Lawson, 1980; Kraig & Keel, 2001) or females only rate male stimuli (Kirkpatrick & Sanders, 1978). Therefore, it has yet to be assessed what adjective associations male participants make with female stimuli.

The second limitation of the adjective methodology is the neglect of adult participants. Only one study explored adjective associations with body figures that included adult participants. Kirkpatrick and Sanders (1978) investigated the association between personality characteristics with body figures in 500 participants from age 6 through 60 using Staffieri’s (1967) design. The male and female participants were recruited from city schools (ages 6-15); universities, churches and civic clubs (ages 16-59); and nursing homes and apartment complexes (ages 60 and over). In general, all participants associated significantly more negative characteristics (lonely, weak, sad, afraid) with the overweight body type and more positive characteristics (helps others, lots
of friends, healthy) with the muscular and thin body types. The participants emerging into adulthood (ages 19-25) rated the overweight and thin body types equally negative, whereas those mid-life and beyond (ages 26 +) associated more negative characteristics with the thin body type. The authors viewed this result as evidence that as a person’s age increases, his or her figure is more likely to become closer to the overweight body type and further away from the thin body type. No significant differences were found between the sexes. Several convenience samples were used in the study, including those recruited from nursing homes, churches, and apartment complexes. Additionally, the statistical analysis was conducted on sex differences. Another limitation was that female stimulus figures were not implemented so it was not determined if these results apply to female body types. The differences between ages were explained in trends rather than statistical analyses and it cannot be determined if there were significant differences among the age groups.
Chapter II

Rationale and Hypotheses

In the United States, one-third of the population is defined as obese and another one third is defined as overweight. As a whole, the weight of the United States population has increased by 10% over the past 20 years (Centers for Disease Control & Prevention, 2009a; Ogdon & Carroll, 2010). Although overweight and obese individuals are prevalent in the population, these people frequently experience negative comments from others (Puhl, Andreyeva, & Brownell, 2008; Puhl & Brownell, 2001). Stereotypes of obese individuals often originate in combinations of negative adjectives. For example, overweight individuals have been described as lazy, ugly, lonely, and selfish (Bell & Morgan, 2000; Kraig & Keel, 2001; Staffieri, 1967). These adjectives can then create a stereotype of overweight individuals. Weight stereotypes are correlated with a variety of negative experiences in the world including, but not limited to, employment discrimination and limited reciprocal friendships (Judge & Cable, 2010; Roehling, 2002; Strauss & Pollack, 2003).

When viewing weight status on a continuum from emaciated to extremely obese, the individuals at both ends of the poles are attributed more negatives ratings and experiences than individuals with an average weight status (Greenleaf, et al., 2004). Extremely thin and obese female figures are rated less attractive, more boring, and unfriendly than average body shapes (Fallon & Rozin, 1985; Fingeret, et al., 2004; Greenleaf et al., 2004). Male body shapes that are either emaciated or extremely obese
have been found to be rated more aggressive and socially unfavorable than average weight figures (Lerner, 1969; Staffieri, 1967). Additionally, extremely thin and obese individuals have reported more negative relationships with family and friends than average weight individuals (Carr & Friedman, 2006). Although overweight and obese individuals experience negative remarks from others, individuals whose body shapes are extremely different from average have the most negative experiences in everyday life.

The current investigation is designed to explore undergraduate participants’ attitudes regarding body shapes. Attitudes will be assessed using an adjective methodology, which requires participants to assign adjectives with body shapes (Kraig & Keel, 2001; Greeneleaf, et al., 2006; Lernern & Korn, 1972; Staffieri, 1967). Currently, adjective investigations suffer from two major limitations. First, many studies have only investigated adjective associations with male body shapes. Specifically, the studies involve male participants assigning adjectives with male figures (Lerner, 1969; Lerner & Korn, 1972; Staffieri, 1967). When male and female figures are employed, the participants only assign adjectives with the stimulus figures of their same sex (Brylinsky & Moore, 1994; Lawson, 1980, Kraig & Keel, 2001). Therefore, males are not rating female body shapes and females are not rating male body shapes.

The second major limitation is that the adjective methodology is rarely used with adult participants (Kirkpatrick & Sanders, 2008). A study by Kirkpatrick and Sanders (1978) had adult participants assign adjectives to adult figure stimuli. However, the authors reported trends in the assignment of adjectives and not statistical analyses. A small study by Greenleaf et al. (2004) had participants assign eight weight-related and 10 personality-related adjectives with Stunkard’s Figure Rating Scale, which is a widely
employed stimulus field of body shapes that was designed to measure body image and dissatisfaction (Bulik, et al., 2001; Fallon & Rozin, 1985; Silberstein et al., 2008; Stunkard, et al., 1983; Thompson & Altabe, 1991). The current study intends to expand the use of personality adjectives to determine attitudes regarding female body shapes employing Stunkard's Figure Rating Scale. In addition, the use of undergraduate participants closes the gap between the abundant investigations with children and the scarce investigations with adults. Hypotheses are as follows:

**Null Hypothesis:** There are no differences in participants’ pairings of adjectives among thin, average, and overweight figures.

**Alternative Hypothesis I:** Participants pair significantly more negative adjectives (worried, mean, shy, aggressive, afraid, competitive, pessimistic, lazy) with the thin and overweight figures than with the average figures.

**Alternative Hypothesis II:** Participants pair significantly more positive adjectives (sociable, hard-working, neat, cooperative, careful, disciplined, helpful, respectful) with the average figure than with the thin or overweight figures.

The hypotheses were developed to capture how individuals' use words to describe specific body shapes. Based on the literature review, it is hypothesized that figures on both extremes of the scale are viewed more negatively than figures located in the average range of the scale. By analyzing the distribution of figure pairing with each of the adjectives, the investigation can observe the perceptions individuals make of body shapes in everyday life.
Chapter III

Method

Participants

One hundred twenty-eight male and female participants will be recruited for this study. Participants will be recruited through the Xavier University Department of Psychology Participant Pool. Power analysis of the total sample required at the $p = .05$ with a medium effect size (.30) informed the proposed sample size in that the total sample size should be five times larger than the frequency of data cells (Cohen, 1992; Redden, 1994).

Materials

**Online Adjective Pairing Task.** The adjective pairing task requires participants to pair each adjective with a body shape in a stimulus field of three body shapes. Fifteen of the 16 adjectives selected for the study came from the Personality Adjective Check List (PACL) developed by Theodore Millon (Strack, 1991; Strack 2008). Seven negative adjectives (*worried, mean, shy, aggressive, afraid, competitive, pessimistic*) and eight positive adjectives (*sociable, hard-working, neat, cooperative, careful, disciplined, helpful, and respectful*) will be employed. In addition to the 15 adjectives from the PACL, the adjective *lazy* will be included in the study. In previous investigations, *lazy* has been associated with obese figures (Bell & Morgan, 2000; Kraig & Keel, 2001; Lerner, 1972; Staffieri, 1967). The sixteen adjectives were selected for the study for
several reasons. First, the adjectives were employed or analogous to the adjectives employed in investigations with children (Bell & Morgan, 2000; Brylinsky & Moore, 1994; Cramer & Steinwart, 1998; Greenleaf, et al., 2006; Kraig & Keel, 2001; Lerner, 1972; Staffieri, 1967). Second, positive and negative adjectives were included to balance the valence of adjectives in the task. Finally, positive and negative adjectives have been assigned to different stimulus figures in adjective literature. Specifically, negative adjectives have been assigned with the extreme ends of the figures on body shape scales, whereas positive adjectives have been assigned to figures in the average body shape range (Greenleaf, et al., 2004; Lerner, 1969; Staffieri, 1967).

The author has selected female line drawings to represent the female stimulus field in the current investigation. Over twenty line drawing scales exist in the current literature (Thompson & Gray, 1995). Stunkard’s Figure Rating Scale (FRS) will be adapted for the current study. Figures 2, 4, and 7 of the FRS will be used in the investigation the represent thin, average, and overweight figures as supported by the research by Greenleaf and colleagues (2004).

**Demographic Information.** The participants will provide demographic information including their age, sex, gender, and ethnicity.

**Weight Status.** Participants will provide information on their current body shape.

**Procedure**

This study will be conducted using an online survey format. Participants will first access a webpage that introduces them the aim of the current study. Xavier University’s Institutional Review Board will approve the design of the study.
After reading the introduction to the survey, participants will continue to the survey. Demographic information, the stimulus field of three figures, instructions for the adjective pairing task, and the list of adjectives will appear as participants scroll-down the web page. The instructions read as follows:

“We are collecting opinions on various figures. Please select the name of the figure that best represents each the adjective listed below.”

Following the completion of the task, participants will click the “Submit” button, which will redirect them to an additional survey page that will require them to report their body shape. The instructions for reporting body shape reads as follows:

“Do you think of yourself as thin, average, or overweight?”

Participants will the click the “Submit” button after completing the demographic information, which will redirect them to an additional survey page thanking them for their participation in the study.
Chapter IV

Proposed Analyses

Hypothesis I states that participants will pair significantly more negative adjectives with the thin and overweight figures than with the average figure. A log-linear analysis will be conducted to explore the main effects and interactions of the variables in the study and to identify how negative adjectives best pair with the three figures. Log linear analysis was selected because it explores the interactions of more than two nominal variables.

Hypothesis II states that participants will pair significantly more positive adjectives with the average figure than with the thin and overweight figures. A log-linear analysis will also be conducted for the positive adjectives to explore the main effects and interactions of the variables and to identify how positive adjectives best pair with the three figures.
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Running head: ADJECTIVE PAIRINGS

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Appendix A

Online Survey: Adjective Pairing Task

You are being asked to participate in a survey research project entitled "Adjective Descriptions of Female Body Shapes," which is being conducted by Lindsey Ann Ohler, M.A., a graduate student at Xavier University. This survey is confidential and will take approximately 15 minutes for completion. No one, including the researcher, will be able to associate your responses with your identity. Your participation is voluntary. You may choose not to take the survey, to stop responding at any time, or to skip any questions that you do not want to answer. You must be at least 18 years of age to participate in this study. Your completion of the survey serves as your voluntary agreement to participate in this research project and your certification that you are 18 or older.

Questions regarding the purpose or procedures of the research should be directed to Janet R. Schultz at 513-745-3248 or schultzj@xavier.edu. If you have concerns or questions about your rights as a research participant, you may contact the IRB office at 513-745-2870 or irb@xavier.edu.

Submit

Powered by SurveyMonkey

Check out our sample surveys and create your own now!
Sex

- Male
- Female

Ethnicity

- White, Non-Hispanic
- African American
- Hispanic
- Asian
- Other

Age
Stimulus figures in the Figure Rating Scale are protected by copyright so it is not reproduced in this document. The measure is published in and available from "Use of the Danish Adoption Register for the Study of Obesity and Thinness" by A. Stunkard, T. Sorensen, and E. Schulsinger, in The Genetics of Neurological and Psychiatric Disorders, edited by S. Kety, 1980, p. 119. Copyright 1983 by Raven Press.

We are collecting opinions on various figures. Please select the number of the figure that best represents each adjective listed below.

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Do you think of yourself as thin, average, or overweight?

- Thin
- Average
- Overweight
Chapter V

Dissertation

Abstract

As weight status and body shapes in the United States increase, it is important to understand the associations people make with particular body shapes. Undergraduate participants ($N = 131$, $M_{\text{age}} = 20.23$) were recruited to complete a 15-minute online survey assessing the adjective pairings they made with thin, average, and overweight female body shapes. Results indicated that participants made a statistically significant adjective-body shape pairing for 15 of the 16 adjectives. Six negatively-valenced adjectives were paired with either the thin or overweight figure, while five positively-valenced adjectives were paired with the average figure. The results revealed that the undergraduate participants made positive associations with the average figure, but adjective pairings became more negative as body shapes moved away from the average figure in either direction. The discussion includes the interpretation and implications of these results, as well as future directions for adjective research.
Adjective Pairings with Female Body Shapes

Introduction

The prevalence of overweight and obese Americans has grown by 10% in the past 20 years. Two-thirds of adults are currently overweight or obese, with the trend towards weight gain affecting all ages, sexes, and ethnicities (Centers for Disease Control and Prevention, 2009a; Centers for Disease Control and Prevention, 2009b; Ogden & Carroll, 2010). In national college samples, the percentage of undergraduate students with a healthy BMI (18.5 – 24.9) has slightly decreased from 65.2% in 2000 to 61% in 2012 (American College Health Association, 2007; American College Health Association, 2012). The percentage of underweight students (BMI < 18.5) has also decreased from 5.4% in 2000 to 4.6% in 2012. Although the percentage of overweight students (BMI 25 - 29.9) has remained at 22% over the last 12 years, there is a small yet growing proportion of students identified as having Class I (BMI 30 - 34.9), Class II (BMI 35 – 39.9), and Class III obesity (BMI ≥ 40). Despite the increase in overall BMI status, approximately 54% of undergraduate students in both the 2000 and 2012 samples perceived themselves as having an average weight.

Individuals with overweight or obese body shapes experience numerous social consequences. First, overweight employees experience significant wage discrimination, early termination, and unequal promotion opportunities in their workplaces compared to their average and thin shaped colleagues (Judge & Cable, 2010; Maranto & Stenoien, 2000; Paul & Townsend, 1995). Second, obese individuals are often teased about their weight from their loved ones, which decreases their relationship satisfaction (Boyce & Latner, 2009; Carr & Friedman, 2006; Eisenberg, Neumark-Sztainer, & Story, 2003).
Moreover, healthcare workers specializing in obesity have been found to hold negative, implicit attitudes about overweight and obese individuals (Schwartz, Chambliss, Brownell, & Billington, 2003; Teachman & Brownell, 2001). Therefore, overweight people seeking assistance for their weight problems may experience a negative bias from those they trust to help them improve the quality of their lives.

Although thin body shapes have become the ideal standard for attractiveness among female adolescents and adults in the United States (Fallon & Rozin, 1985; Parkinson, Tovee, & Cohen-Tovee, 1998), perceptions of emaciated body shapes are similar to those of obese shapes. For example, Swami and colleagues (2008) found that adults of both sexes associated loneliness with both emaciated and overweight body shapes. Furthermore, multiple studies have found that participants are significantly less likely to hire (Swami, Chan, Wong, Furnham, & Tovee, 2008) or engage in helping behaviors (Swami, Pietschnig, Stieger, Tovee, & Voracek 2010) with emaciated and obese individuals.

Descriptions of thin body shapes are complex due to positive and negative associations made with thin figures. For example, a thin body can be perceived as smart and physically fit by some individuals while others perceive a thin body as unfriendly and frail (Greenleaf et al., 2004). Furthermore, women perceive a thin/slender shape as attractive, while men perceive attractive women as having an average body shape (Fallon & Rozin, 1985; Rozin & Fallon, 1998). Although recurring negative associations are made with an overweight shape, inconsistent findings have been found with thin body shapes. Overall, the amalgamation of results in the body shape literature indicates that body shapes that deviate from an average figure, regardless of the direction on the body
shape continuum, are associated with negative ratings and descriptions (Bell & Morgan, 2000; Brylinsky & Moore, 1994; Greenleaf et al., 2004; Kirkpatrick & Sanders, 1978; Kraig & Keel, 2001; Lawson, 1980, Lerner, 1969; Lerner & Korn; Staffieri, 1967).

Numerous methodologies have been employed to assess perceptions of body shapes (Crandall, 1994; Schwartz et al., 2003; Schwartz et al., 2006; Swami et al., 2008). For example, participants have attributed negative information, such as poor social skills and athletic abilities, with overweight stimulus figures after reading short vignettes (Counts et al., 1998; Cramer & Steinwart, 1998; DeJong, 1980; Hebl & Mannix, 2003; Penny & Haddock, 2007; Swami et al., 2008). Additionally, results of face-valid measures of antifat attitudes revealed that many adults openly endorse unfavorable statements about overweight individuals such as “Fat people make me somewhat uncomfortable” (Crandall, 1994; Crandall & Martinez, 1996). Finally, studies implementing implicit attitude tests revealed that participants carry subtle, unconscious associations between “lazy” and “overweight” without explicitly acknowledging their personal biases against larger body shapes (Schwartz et al., 2003; Schwartz et al., 2006; Teachman & Brownell, 2001; Teachman et al., 2003). The implication of these findings is that overweight and obese individuals may be frequently interacting with people who are carrying biases against them based on their body shapes.

Adjective pairings with body shapes is a commonly used methodology to assess body shape perceptions with young children (Bell & Morgan, 2000; Brylinsky & Moore, 1994; Greenleaf et al., 2004; Kirkpatrick & Sanders, 1978; Kraig & Keel, 2001; Lawson, 1980; Lerner, 1969; Lerner & Korn, 1972; Staffieri, 1962). In adjective investigations, children are instructed to pair adjectives with thin, average, and overweight body shapes.
The results of these studies have demonstrated that children pair positively-valenced adjectives with average body shapes while pairing negatively-valenced adjectives with thin and overweight figures (Greenleaf et al., 2004; Kraig & Keel, 2001; Staffieri, 1967).

The neglect of adult participants in adjective investigations has limited the generalization of results to people beyond the age of 16. Although two adjective investigations have included adult participants, each has its limitations. The first study by Kirkpatrick and Sanders (1978) included participants ranging from age 5 to 69 who made adjective pairings with male body shapes. Findings from this investigation revealed trends in adjective pairings with participants’ age, but statistical analyses were not conducted and inferences could not be made about the relationship between participants’ ages and adjective pairings. The other study, conducted by Greenleaf and colleagues (2004), had participants of both sexes pair adjectives with stimulus figures from both sexes. Participants were instructed to list weight-related words, such as “fat” and “skinny” for each figure before completing the adjective pairing task, which may have influenced participants’ adjective-body shape pairings. The current study was designed to assess the adjective-body shape pairings with an undergraduate sample and increase the generalizability of adjective literature to an adult population.

The exclusion of female stimulus figures and female participants are additional limitations of adjective investigations. Many studies, including those conducted by Staffieri (1967) and Lerner (1979), incorporated only male participants and male stimulus figures. Later investigations began including female participants and stimulus figures, but neglected to have participants make adjective pairings for stimulus figures of the opposite sex (Brylinsky & Moore, 1994; Lawson, 1980, Kraig & Keel, 2001). In these
studies, females made adjective pairings with female figures and males made adjective pairings with male figures. Although Kirkpatrick and Sanders (1978) included participants of both sexes, adjective pairings were only completed for male figures. For that reason, the current investigation explored adjective pairings men and women made with female stimulus figures.

The current investigation was designed to extend the adjective methodology to adult participants by including a sample of undergraduate participants. The use of undergraduate participants closes the gap between the abundant investigations with children and the scarce studies with adults. Furthermore, the inclusion of both sexes in this sample will provide valuable insight of how young adults perceive female body shapes. Finally, the study expanded Greenleaf and colleagues' (2004) use of 10 personality adjectives to 16 adjectives in the current investigation. We hypothesize that participants will pair significantly more negative adjectives (*worried, mean, shy, aggressive, afraid, competitive, pessimistic, lazy*) with the thin and overweight figures compared to the average figure. Conversely, we hypothesize that participants will pair significantly more positive adjectives (*sociable, hard-working, neat, cooperative, careful, disciplined, helpful, respectful*) with the average figure than with the thin or overweight figures.

**Method**

**Participants**

The Xavier University Institutional Review Board approved this study prior to recruitment. The undergraduate participants were recruited through the psychology
department's participant pool and were offered research credit in exchange for their participation.

An a priori power analysis of the total sample required at the $p = .05$ with a medium effect size (.30) informed the proposed sample size (Cohen, 1992). The final sample ($n = 131$) included 42 men (32.1%) and 89 women (67.9%). The age range of participants was from 18 to 40. Approximately 96.2% of the sample was between the ages of 18 and 23 with the mean age of the sample being 20.2 ($SD = 2.4$). Participants were predominantly White, Non-Hispanic (80.9%), with smaller proportions of African Americans (12.2%), Hispanics (1.5%), Asian (1.5%), and other ethnicity (3.8%). Seventy-percent of the total sample identified their weight status as average, 19.8% as thin, and 9.9% as overweight. Sixty-three percent of men identified their weight status as average, 30% thin, and 7% overweight. Seventy-four percent of women reported being average, 15% thin, and 11% overweight.

Measures

**Online Adjective Pairing Task.** The online adjective pairing task required participants to pair 16 adjectives with a body shape from a stimulus field of three female figures (see Appendix A). Fifteen of the 16 adjectives selected for the study were derived from the Personality Adjective Check List (PACL) developed by Theodore Millon (Strack, 1991; Strack 2008). Seven negative adjectives (*worried, mean, shy, aggressive, afraid, competitive, pessimistic*) and eight positive adjectives (*sociable, hard-working, neat, cooperative, careful, disciplined, helpful, and respectful*) were used in the current study. The valence of the adjectives was informed by previous studies in which the items were described or labeled as favorable or unfavorable terms (Lerner & Korn, 1972;
Kirkpatrick & Sanders, 1976; Staffieri, 1967). *Lazy* was also included in the study because it was repeatedly associated with obese figures in previous investigations (Bell & Morgan, 2000; Kraig, & Keel, 2001; Lerner, 1972; Staffieri, 1967).

The stimulus field of female body shapes was adapted from Stunkard’s Figure Rating Scale (FRS) (Stunkard, Sorenson, Schulsinger, 1983). Figures 2, 4, and 7 of the FRS were employed in the current study to represent thin, average, and overweight figures (Greenleaf et al. 2004). Greenleaf and colleagues’ (2004) had 131 undergraduate participants select the FRS female figure that best represented the terms thin, normal weight, and overweight. Mean results from the selections of these figures demonstrated that participants selected Figure 2 to represent thin, Figure 4 to represent normal weight, and Figure 7 to represent overweight. Further support for the selection of Figures 2, 4, and 7 comes from an investigation by Bhuiyan and colleagues (2003) in which the authors classified Figures 1 and the 2 of the FRS as underweight, 3 and 4 as appropriate weight, 5 as slightly overweight, 6 and 7 as moderately overweight, and 8 and 9 as very overweight. Finally, a sample of MD and PhD professionals of the Pediatric Obesity Research Interest Group of the North American Association for the Study of Obesity estimated BMI percentile ranks for the FRS female figures. The estimated percentile rank was 15.5 for Figure 2, 59.3 for Figure 4, and 97.6 for Figure 7 (Must, Stunkard, & Maunova, 2002). Names were placed under each stimulus figures as a reference for participants.

**Demographic Information.** Participants were asked to provide demographic information including age, sex, ethnicity, and self-reported weight status.
Procedure

Participants were introduced to the online survey through a hyperlink (tinyurl.com/XUAjjective). The first webpage participants accessed introduced them to the aim of the survey and whom to contact with any questions regarding the survey (see Appendix A).

Online Survey. After the introduction to the study, participants were directed to a webpage with demographic questions and the adjective task. Participants first entered personal information, including sex, age, and ethnicity. After providing demographic information, participants were directed to the stimulus field of body shapes, instructions for the adjective task, and the list of adjectives. The instructions read as follows:

“We are collecting opinions on various figures. Please select the name of the figure that best represents each adjective listed below.”

Following the adjective-pairing task, participants provided their self-reported weight status. The instructions for reporting self-reported weight status read as follows:

“Do you think of yourself as thin, average, or overweight?”

After completing the weight status question, participants were thanked for their participation in the study.

Results

A Log linear analysis was selected as the appropriate statistic for the current study because it would identify how clusters of positive and negative adjectives are best paired with the three stimulus figures. Unfortunately, complications with the SPSS software prohibited the completion of the log linear analyses. Several contacts were made to contact SPSS technical support, but the company was unable to service our request. Chi-
square statistical analyses were conducted to determine if there were significant
differences in the pairings of stimulus figures with each adjective. The chi-square
analysis was used in previous research that explored the associations between adjectives
and stimulus figures (Lawson, 1980; Lerner, 1989; Staffieri, 1967). The results of the
chi-square tests were significant for all adjective-body shape pairings with the exception
of aggressive, $(2, N = 131) = 9.52, p > .05$ (see Table 1).

The chi-square follow-up analyses demonstrated that the hypothesis for negative
adjectives was supported. Worried, shy, and lazy were paired significantly more often
with the overweight figure, while pessimistic, afraid, and mean were paired significantly
more often with the thin figure (see Table 2). Competitive was paired equally between
the thin and average figure. The hypothesis for positive adjectives was partially
supported in that five positive adjectives (sociable, respectful, hardworking, cooperative,
helpful) were paired most frequently with the average figure while careful, disciplined,
and neat were paired equally between the thin and average figures (see Table 3). The
frequencies of adjective-body shape pairings by participants’ sex can be viewed in Table
4 and Table 5, while the frequencies of adjective-body shape pairings by participants’
self-reported weight status can be viewed in Table 6 and Table 7.

A post hoc cluster analysis was performed to categorize the adjectives that
clustered into homogenous subgroups. A hierarchical cluster analysis using the
agglomeration method resulted in two clusters of homogenous adjectives. Cluster I
consisted of 12 adjectives: Sociable, Aggressive, Respectful, Competitive, Pessimistic,
Careful, Cooperative, Hard-working, Helpful, Mean, Disciplined, and Neat. Cluster II
included the adjectives *Worried, Lazy, Shy, and Afraid*. Three of the adjectives in Cluster II were paired most frequently with the overweight figure.

**Discussion**

The purpose of this study was to extend the adjective methodology to an adult sample and investigate if adults made adjective-body shape pairings similar to children in previous studies. Additionally, male and female participants paired adjectives with female figures, which also has been a neglected area of research. Participants in the current investigation completed an online survey that required them to pair adjectives with thin, average, and overweight body shapes. Participants also completed demographic variables that assessed their age, ethnicity, and self-reported weight status.

**Current Results**

**Adjective pairings.** The first hypothesis that negative adjectives would be paired most frequently with thin or overweight figures was supported for seven of the eight adjectives. *Lazy, worried, and shy* had statistically significant pairings with the overweight figure, which is consistent with previous adjective research (Greenleaf et al., 2004; Greenleaf et al., 2006; Staffieri, 1967). The pairing of *lazy* with the overweight figure yielded a .80 effect size suggesting an ample magnitude in the relationship between these variables. Furthermore, Cluster II of the analysis also included *lazy, worried, and shy*. The overwhelming association between *lazy* and an overweight body shape is well documented on both explicit and implicit levels (Crandall 1994; Schwartz, Vartanian, Nosek, & Brownell, 2006). For example, Crandall (1994) found that people openly endorsed antifat attitudes such as “fat” people have no willpower over their eating habits or exercise routines. Furthermore, Schwartz and colleagues (2006) discovered that
individuals frequently make implicit pairings between the words "lazy" and "overweight."

_Pessimistic, afraid, and mean_ were the negative adjectives paired most frequently with the thin figure. The current results support previous research in which both positive and negative adjectives are paired with thin figures (Greenleaf et al., 2004; Greenleaf et al., 2006; Kirkpatrick & Sanders, 1978). In some investigations, the adjectives _afraid_ and _worries_ are associated with the thin figure, while _motivated_ and _physically fit_ are associated with the thin figure in other studies (Greenleaf et al., 2004; Staffieri, 1967).

The challenge of comparing the current results with previous literature is that the strengths of the current study (undergraduate psychology students, female stimulus figures) are unique to the current investigation. One implication supported by the current study and previous research is that negative adjective pairings are more likely to occur as body shapes deviate from an average figure.

The second hypothesis is partially supported in that _sociable, respectful, hardworking, cooperative, and helpful_ were paired significantly more frequently with the average figure than with the thin or overweight figures. These results parallel decades of adjective research in which positive adjectives are overwhelmingly paired with average body shapes (Brylinsky & Moore, 1994; Greenleaf et al., 2004; Kirkpatrick & Sanders, 1978; Kraig & Keel, 2001; Lawson, 1980; Staffieri, 1967). The three remaining positive adjectives (_careful, disciplined, and neat_) had non-significant pairings between the thin and average figures. However, these adjectives were paired significantly more often with the thin and average figures than they were with the overweight figure. In the adjective literature, _careful_ has had non-significant pairings between the thin and average figures
(Greenleaf et al., 2004). Furthermore, neat has been sometimes paired with the average figure and at other times paired with the thin figure (Greenleaf et al., 2004, Kirkpatrick & Sanders, 1978, Lerner & Korn, 1972). Given that the approximately 68% of the sample was female, it not surprising that positive adjectives were paired with the thin figure. Body image research demonstrates that women perceive thin body shapes as most attractive and idealize a thin body shape for themselves (Fallon & Rozin, 1985; Rozin & Fallon, 1998; Swami et al., 2007). Male participants in the current study also paired more positive adjectives with the thin or average figure (see Table 5).

Aggressive was the only adjective in the study that had non-significant pairings with any of the body shapes. The result is inconsistent with previous literature. For example, characteristics that represent aggressive such as lies, naughty, teases, and fights were paired with overweight figures in previous literature (Lerner & Korn, 1972; Staffieri, 1967). However, these studies may be outdated and include male stimulus figures making it unclear if participants would make the same adjective-body shape pairings with female figures.

The results of the current study demonstrate that male and female participants make similar adjective-body shape pairings with female figures as children do with male figures (Kriag & Keel, 2001; Lerner & Korn, 1972, Staffieri, 1967). More importantly, the results of adjective-body shape pairings have been consistent over the past 40 years suggesting that these pairings permeate American culture. Even in the current society, with individuals of all races and sex increasing in overall weight, there are consistent findings of how individuals negatively perceive overweight and obese body shapes and to some extent emaciated individuals.
**Self-reported Weight Status.** The majority of the sample (70%) identified themselves as having an average body shape, which is consistent with national statistics of college students (American College Health Association, 2012). In the current study, there were no differences in adjective-body shape pairings when taking into account participants' self-reported weight status (see Table 6 and Table 7). Previous studies also supported that personal body shape does not influence adjective-body shape pairings (Counts et al., 1986; Kring & Keel, 2001). For example, Counts and colleagues (1986) discovered that overweight and average weight children associated positive characteristics (*better leader, better partner*) with an average stimulus figure and negative descriptions (*sad, fights*) with an overweight figure. Kraig and Keel (2001) replicated these findings with results that demonstrated that young boys paired positive adjectives (*kind, honesty, funny*) with a thin stimulus figure and negative adjectives with an overweight (*lonely, lazy, ugly*) stimulus figure regardless of their personal BMI.

Similar to the results of adjective studies, results of implicit attitude investigations demonstrated that personal size does not influence participants' associations with body shapes. Schwartz, Bartanian, Nosek, and Brownell's (2006) study exploring participants' weight status and implicit attitudes about body shapes supports the weight status finding in the current investigation. Schwartz and colleagues discovered that participants ranging from underweight to extremely obese made implicit negative associations of "lazy" and "bad" with the term "overweight." However, the frequency of "bad" and "overweight" pairings decreased as personal weight status increased to extremely obese. Therefore, participants in the extremely obese category also made negative associations with the term "overweight." This finding parallels the results of the current study in which there
were no significant differences in adjective pairings when taking into account personal weight status.

**Strengths and Weaknesses of the Current Investigation**

A major strength of the current study was the inclusion of the self-reported weight status question. Participants’ self-reported weight status allowed an exploration of how participants made adjective-stimulus associations in relationship to their identified weight status (see Table 6 and Table 7). Additionally, placing the self-reported weight status question at the end of the survey reduced priming or bias in responses on the adjective-pairing task. The finding that 70% of participants identified as having average weight increases the generalizability of results as approximately 60% of respondents in the American College Health Association’s (2012) assessment of undergraduate students reported having an average weight. Trends in the American College Health Association’s yearly undergraduate assessment demonstrate that the percentage of undergraduates who self-report a thin or average weight status has decreased over the past 10 years (American College Health Association, 2007; American College Health Association, 2012). It may be possible that undergraduates’ reference for body shapes has also increased during this time, and that the current participants considered the body shape of their peers when reporting the current weight status.

The privacy of the online survey format was another strength of the current investigation. The online survey format allowed participants to respond openly to questions at a time that was convenient for them. The format reduced bias that would have occurred if participants completed the survey in a group format in which the peers
around them could have influenced them. Moreover, the online format increased the speed of data collection for the primary investigator.

The greatest strength of the current study is the age range of participants. The current investigation extended the adjective literature from children and adolescents by including a sample of young adults. Although the age of the sample provides preliminary results with an adult population, the demographics where the research was conducted reduce the generalizability of results. For example, approximately 81% of the sample was White, Non-Hispanic students, which is consistent with the overall student population of the university where the research was conducted. Furthermore, the majority of participants were in the age range of 18 to 23. Although the study provided unique insight into the adjective pairings made by undergraduate students, future investigators should broaden their samples to be more inclusive of age and ethnic diversity.

Another advantage of the study was the use of female stimulus figures. Because the adjective literature has scarcely utilized cross-sex adjective pairings, the current study provides valuable information on how both sexes make adjective pairings with female body shapes. The current study demonstrates that participants make similar adjective-body shape pairings with female figures as they do with male figures. Additionally, the study provides data suggesting that participants make similar adjective-body shape pairings regardless of their self-reported weight status. The results of the current investigation may explain how the young adult population perceives women of varying body shapes.

The number of figures included in the stimulus figure is both a strength and weakness of the current study. Adjective investigations have included anywhere from
three (Greenleaf et al., 2006; Kirkpatrick & Sanders, 1978; Kraig & Keel, 2001; Staffieri, 1967) to nine stimulus figures (Greenleaf et al., 2004). Research by Ambrosi-Randic and colleagues (2005) discovered that the number of figures in a stimulus field was insignificant because participants rarely selected figures at the ends of the continuum. The selection of figures in the current study was influenced by research conducted by Greenleaf and colleagues (2004) that found figures of 2, 4, and 7 of Stunkard’s Figure Rating Scale best represented thin, average, and overweight body shapes. Although the current investigation appropriately included three figures, additional body shapes would have permitted the analysis of the location of figures in the stimulus field where participants began making negative adjective associations with body shapes.

Although chi-square analyses were supported by previous research (Lawson, 1980; Lerner, 1989; Staffieri, 1967), approximately 50 analyses were needed to understand the results. A general chi-square analysis was conducted to determine if there were significant differences between the pairings of the adjectives and figures in the stimulus fields. For each significant adjective-body shape pairing, three additional follow-up tests per adjective were required to determine where significant differences occurred within the adjective pairings. Due to the likelihood of making a Type I error, a $p < .01$ significance level is best used to find true significance in the difference of adjective-body shape pairings. As seen in Table 1, all significant adjective-body shape pairings occurred at a .01 level. However, the repetitions of chi square analyses with a small sample size for the post hoc analyses may have increased the likelihood of Type II errors and the chance of accepting the null hypothesis when it is actually false (Bradley, Bradley, McGrath, & Cutcomb 1979; MacDonald & Gardner, 2000). Because the chi-
square analyses were conducted on a single variable there were no methods for controlling the error rates (Bradley et al., 1979). However, there are methods for controlling for Type I error rates when two variables are used in a 2 x 2 contingency table (McDonald & Gardner, 2000). MacDonald and Gardner (2000) identified three methods for analyzing differences in proportions and controlling for Type I error: a Bonferroni adjustment for 2 x 2 contingency tables; adjusted residuals; and using the formula \( x^2(n - \alpha) \) for critical values. The Monte Carlo method also is promising for controlling for Type I errors as a result of multiple comparisons. Because chi-square analyses were not conducted with a 2 x 2 contingency table, these methods are not appropriate. Therefore results of the analyses should be interpreted at a \( p < .01 \) significance level and post hoc comparisons should be considered with caution as a result of the numerous iterations and reduced sample size. Additionally, a different analysis, such as the log linear analysis, would have permitted the interpretation of results with the completion of one statistical test. However, complications with the statistical software prohibited these analyses. Because of the categorical nature of the female figures, other forms of such analyses, including logistic regression and logit analyses, are inappropriate because they must include at least one continuous variable (J. Beckstrand, personal communication February 7, 2013)

**Future Directions**

The current investigation provides preliminary data on young adults’ adjective-pairings with body shapes. Given the nature of the sample, predominantly Non-Hispanic White participants attending a Catholic university, the homogeneity of the current sample may have influenced the results responses. For that reason, the adjective-body shape
literature will benefit from expanding the diversity of their sample in both age and ethnicity. The adjective literature has often neglected minority participants, so it is imperative for future research to include samples with greater diversity. Additionally, future studies should be expanded to include middle-aged and older adults. Body shapes often change during this age range and it will be beneficial to assess how middle-aged and older adults will make adjective associations with body shapes. Finally, future adjective research will also benefit from including both male and female stimulus figures. Although the current investigation was developed to study female figures, the inclusion of male stimulus figures will allow participants of both sexes to make adjectives pairings for both types of stimulus figures, which will provide valuable information on between-sex differences.
References


Table 1

*Chi Square Results of Adjective Pairings with Stimulus Figures*

<table>
<thead>
<tr>
<th>Adjective</th>
<th>Isabella</th>
<th>Sophia</th>
<th>Eva</th>
<th>$\chi^2$</th>
<th>$\phi$</th>
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</thead>
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<td>9</td>
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<tr>
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<td>3</td>
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<td>52</td>
<td>27</td>
<td>9.54</td>
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<td>72</td>
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<td>0.16</td>
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<td>0.05</td>
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<td>3</td>
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<td>50.12*</td>
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</tr>
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<td>63</td>
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<td>6</td>
<td>48.75*</td>
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</table>

* indicates $p < .01$. 

.10 - small effect size  
.30 - medium effect size  
.50 - large effect size
Table 2

Follow-Up Chi Square Results for Negative Adjectives

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<tr>
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<th>Average N</th>
<th>Overweight N</th>
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<td></td>
<td>6</td>
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<td></td>
<td>--</td>
<td>3</td>
<td>122</td>
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<td>--</td>
<td>10.56**</td>
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<td>67</td>
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<td></td>
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<td>0.19</td>
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<td>62</td>
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<td>56.23**</td>
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* indicates $p < .05$.
** indicates $p < .01$. 
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* indicates $p < .05$.
** indicates $p < .01$
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*Frequencies of Negative Adjective-Body Shape Pairings by Sex*

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Table 5

*Frequencies of Positive Adjective-Body Shape Pairings by Sex*

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Frequencies of Negative Adjective-Body Shape Pairings by Self-Reported Weight Status

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Table 7

*Frequencies of Positive Adjective-Body Shape Pairings by Self-Reported Weight Status*

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Appendix A

Online Survey: Adjective Pairing Task

You are being asked to participate in a survey research project entitled “Adjective Descriptions of Female Body Shapes,” which is being conducted by Lindsey Ann Ohler, M.A., a graduate student at Xavier University. This survey is confidential and will take approximately 15 minutes for completion. No one, including the researcher, will be able to associate your responses with your identity. Your participation is voluntary. You may choose not to take the survey, to stop responding at any time, or to skip any questions that you do not want to answer. You must be at least 18 years of age to participate in this study. Your completion of the survey serves as your voluntary agreement to participate in this research project and your certification that you are 18 or older.

Questions regarding the purpose or procedures of the research should be directed to Janet R. Schultz at 513-745-3248 or schultzj@xavier.edu. If you have concerns or questions about your rights as a research participant, you may contact the IRB office at 513-745-2870 or irb@xavier.edu.

Powered by SurveyMonkey

Check out our sample surveys and create your own now!
Sex

- Male
- Female

Ethnicity

- White, Non-Hispanic
- African American
- Hispanic
- Asian
- Other

Age
Stimulus figures in the Figure Rating Scale are protected by copyright so it is not reproduced in this document. The measure is published in and available from "Use of the Danish Adoption Register for the Study of Obesity and Thinness" by A. Stunkard, T. Sorensen, and E. Schulsinger, in The Genetics of Neurological and Psychiatric Disorders, edited by S. Kety, 1980, p. 119. Copyright 1983 by Raven Press.

We are collecting opinions on various figures. Please select the number of the figure that best represents each adjective listed below.

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<th>Eva</th>
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</tbody>
</table>

Do you think of yourself as thin, average, or overweight?

- Thin
- Average
- Overweight
Appendix B

Xavier University IRB Approval Letter

January 26, 2012

Lindsey Ann Ohler
2341 Madison Road Apt. 327
Cincinnati, OH 45208

Dear Ms. Ohler:

Re: Protocol #1137, *Adjective Descriptions of Female Body Shapes*

The IRB has reviewed the revised materials regarding your study, referenced above, and has determined that it meets the criteria for the Exempt from Review category under Federal Regulation 42CFR46. Your protocol is approved as exempt research, and therefore requires no further oversight by the IRB.

If you wish to modify your study, including the addition of data collection sites, it will be necessary to obtain IRB approval prior to implementing the modification. If any adverse events occur, please notify the IRB immediately.

Please contact our office if you have any questions. We wish you success with your project!

Sincerely,

[Signature]

Morell E. Mullins, Jr., Ph.D.
Chair, Institutional Review Board
Xavier University

C: Janet Schultz, advisor
Summary

Title: Adjective Pairings with Female Body Shapes

Problem. A preponderance of research reveals that children pair positively valenced adjectives with average body shapes while pairing negatively valenced with thin and overweight body shapes (Brylinsky & Moore, 2002; Staffieri, 1967). Furthermore, children’s personal size does not influence their perceptions of body shapes, meaning that overweight children are as likely to hold negative perceptions of overweight stimulus figures as are average weight children (Bell & Morgan, 2000; Kraig & Keel, 2001). However, relatively few adjective investigations have included female stimulus figures or adult participants (Greenleaf et al., 2004; Kirkpatrick & Sanders, 1978). The current investigation explored the adjective-body shape pairings undergraduate participants made with thin, average, and overweight female stimulus figures. We hypothesize that participants will pair positive adjectives more frequently with an average figure while participants will pair negative adjectives more frequently with body shapes that deviated from an average figure (i.e., thin, overweight).

Method. Undergraduate participants (N = 131) were recruited to participate in a study exploring “people perceptions.” Participants were directed to an online survey in which they provided demographic information and completed an adjective pairing task. The adjective-pairing task required participants to pair 16 adjectives with one female figure from a stimulus field of a thin, average, and overweight figures adapted from Stunkard’s Figure Rating Scale (Greenleaf et al., 2004; Stunkard, Sorenson, & Schulsinger, 1983). Participants also completed demographic information for their sex, age, ethnicity, and self-reported weight status.

Findings. The sample was predominantly White, Non-Hispanic (80.9%) and female (67.9%). The mean age of the sample was 20.2 (SD = 2.41), with 96.2% of the sample between the ages of 18 and 23. Seventy-percent of the sample identified having an average weight status, which is consistent with national statistics for undergraduate college students (American College Health Association, 2012).

Chi square analyses revealed that participants made significant adjective-figure pairings with 15 of the 16 adjectives. Aggressive had no significant pairings with any of the three stimulus figures (2, N = 131) = 9.52, p > .05. The hypothesis for negative adjectives being paired significantly more frequently with thin or overweight figures was supported. Follow-up chi square tests revealed that worried, shy, and lazy were paired significantly more often with the overweight figure, while pessimistic, afraid, and mean were paired significantly more often with the thin figure. Notably, there was a large effect size (.80)
for the pairing of lazy with the overweight figure. The hypothesis for positive adjective-body shape pairings was partially supported in that with four adjectives (sociable, respectful, hardworking, cooperative) were paired significantly more often with the average figure. Careful, disciplined, and neat were paired equally with the thin and average figures, but significantly less often with the overweight figure.

**Implications.** The results of the adjective-figures pairings suggest that the young adult participants paired negative adjectives with body shapes that deviated from an average shape. The finding extends the results of adjective research with children to a young adult sample. The current study also demonstrates participants made adjective-body shape pairings with female figures that are similar to the pairings made with male figures in previous studies. Additionally, the results reveal that participants made similar trends in adjective-body shape pairings when taking into account their weight and self-reported weight status. The results are notable because research has well established that college students easily gain weight during their college years. Therefore, it is interesting that college students attribute positive adjectives to the average figure while their body shapes are the most vulnerable to fluctuating in size. Future investigations should consider greater diversity (i.e. age, ethnicity) in their samples in order to determine the generalizability of the adjective-body shape pairings to a broader sample.