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# Race and Obesity: An Exploratory Analysis of Perceptions and Experiences Related to Weight Among Black and White Adults

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UNIVERSITY OF MIAMI

RACE AND OBESITY: AN EXPLORATORY ANALYSIS OF PERCEPTIONS AND  
EXPERIENCES RELATED TO WEIGHT AMONG BLACK AND WHITE ADULTS

By

Kayla Jade Santalla

A THESIS

Submitted to the Faculty  
of the University of Miami  
in partial fulfillment of the requirements for  
the degree of Master of Science

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Race and Obesity: An Exploratory Analysis of  
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This thesis explores race and gender differences in perceptions and behaviors regarding weight and obesity, along with the relative influence of individual and structural factors on the personal weight status of black and white adults. In addition, this study examines the extent to which black and white adults differ in their perceptions of discrimination attributed to their personal weight. Based on an analysis of data from a national poll conducted by ABC News and TIME magazine, results indicate that weight status perceptions of overweight black females were consistent, while incongruity was found in perceived and actual weight status among obese black women. On the other hand, a greater proportion of obese white women under-assessed their weight status compared to obese black women. However, regardless of race, men were more likely to under-assess their weight than women. There were no differences by race and gender in reports of having felt discriminated against because of personal weight status. Findings also revealed that black females and males face greater constraints than their white counterparts related to controlling weight and fighting obesity, including such factors as a lack of information on how to establish good eating habits, the need to monitor food content, and being able to afford the cost of purchasing healthy food. A discussion of

these findings in relation to previous research is provided along with recommendations for further study.

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## **Chapter 1: Introduction**

Obesity continues to be a major health problem in the United States. Overweight and obesity are associated with a number of diseases and metabolic abnormalities which have high morbidity and mortality (Pi-Sunyer 2002). Some of the specific physical health problems associated with obesity include insulin resistance, hyperinsulinemia, type 2 diabetes, hypertension, dyslipidemia, cardiovascular disease, gallbladder disease, certain malignancies, sleep apnea, knee osteoarthritis, and certain types of cancer (Pi-Sunyer 2002; Heo et al. 2003; Lopez 2007). Research suggests that there are also stigmatizations and mental health implications related to overweight and obesity (Friedman et al. 2005; Puhl and Brownell 2006; and Andreyeva, Puhl, and Brownell 2008) including depression (Tunceli, Li, and Williams 2006).

Several epidemiological surveys indicate that the prevalence of overweight and obesity has risen since the late 1980's (Pi-Sunyer 2002). The mounting number of obese people coupled with the slew of health risks associated with obesity has generated critical economic repercussions (Andreyeva, Sturm, and Ringel 2004; Finkelstein, Ruhm, and Kosa 2004; Tunceli, Li, and Williams 2006; and Finkelstein et al. 2008). Research indicates that the adverse health consequences of obesity have resulted in increased health care use and expenditures, to the point that the effects of obesity on health care costs have exceeded the expenditures attributed to smoking and problem drinking (Andreyeva, Sturm, and Ringel 2004). Empirical research indicates that obese individuals, compared to normal weight individuals, are likely to have more physicians visits, more days spent in the hospital, a greater number of pharmacy dispenses, and are more likely to be absent from work (Finkelstein, Ruhm, and Kosa 2004). According to

Tunceli, Li, and Williams (2006), obesity also appears to result in reduced workforce participation and increased work limitations.

According to the Center for Disease Control (CDC), as of 2006, approximately 33 percent of U.S. adult's age 20 years and older were overweight, approximately 34 percent were obese, and approximately 6 percent were extremely obese. Weight status, as determined by individuals computed Body Mass Index (BMI), was calculated using measured heights and weights. BMI provides a reliable indicator of total body fat and is used to infer health risk factors related to given weight categories (CDC 2009). The Center for Disease Control suggests that the prevalence of overweight and obese persons has increased over the past thirty years, currently reaching epidemic proportions (CDC 2009).

While obesity is a problem across all racial groups, there are differences in its prevalence. The starkest difference is between blacks and whites, with black women being the most affected segment in the United States (Robert and Reither 2004; Boardman 2005; and Phuong Do 2007). Of all racial groups, non Hispanic blacks continue to be the most obese population (CDC 2008). The National Health and Nutrition Examination Survey (NHANES) data compiled from 2001-2004 revealed continual growth in obesity prevalence along race and gender boundaries from previous years. Rates of obesity were similar for Non-Hispanic white women (31.5%) and men (31.0). However, this was not the case for non- Hispanic blacks. At this time, 51.6 % of non-Hispanic black women were obese compared to 31.2% of non-Hispanic black men. Between 2003-2004 and 2005-2006 there were not any significant increases in the prevalence in obesity for women or men across racial categories (CDC 2008).

## **Chapter 2: Statement of the Problem**

Obesity is considered a major contributor to racial and ethnic disparities in health status (Yancey et al. 2006). Although the proximate cause of weight gain is understood as the result of consuming too many calories proportionate to the calories expended, the less proximate factors associated with weight gain and obesity are not as clear (Lopez 2007). Additional research is needed to identify specific factors related to overeating, poor diet quality, and under-expenditure of calories (Lopez 2007). More specifically, additional research is needed to better understand why racial inequity in overweight and obesity status among women and men and among black and white adults persists.

### **Chapter 3: Purpose of the Study and Research Questions**

This thesis is designed to be exploratory and is not intended to draw definitive conclusions. A primary purpose of this thesis is to explore black and white, male and female adult differences in perceptions and behaviors regarding weight and obesity. An examination of such perceptions and behaviors is important since research indicates that inaccurate perceptions of weight have been linked to an individual's behaviors related to obesity (Bennett and Wolin 2006). Individual behaviors, specifically related to food consumption and physical activity, are of particular focus in this thesis, as they are known to directly affect weight status (Paeratakul et al. 2002). A second purpose of this thesis is to examine the relative influence of individual and structural factors on the personal weight situation of black and white adults. The final purpose of this thesis is to explore whether black and white adults differ in their perceptions of discrimination attributed to their personal weight.

The specific research questions include:

1. How do black and white adults differ in their perceptions and behaviors regarding weight and obesity?
2. What is the relative influence of individual and structural factors on the personal weight situation among black and white adults?
3. Do black and white adults differ in encountering consequences, specifically perceived discrimination, which they attribute to their weight?

## Chapter 4: Literature Review

This section describes literature relevant to the research questions of this thesis. It is organized into three sections. A review of literature related to: (1) body size perceptions, behaviors, race/ethnicity, and gender, (2) structural conditions and their effects across race and ethnicity in maintaining a healthy weight, and (3) discrimination, obesity, and race. The research included in this review is intended to be selective rather than exhaustive. Research which specifically addressed race/ethnicity, gender, and weight issues is given precedence. At the beginning of each section, I discuss the relevance of the literature reviewed to the research questions in this thesis.

### *Perceptions, Race/Ethnicity, & Gender*

Self perception of body weight is defined as the concordance between an individual's perceived and actual measured weight (Dorsey, Eberhardt, and Ogden 2008). Examining individuals perceived body weight status in relation to their actual weight status with respect to differences in race/ethnicity is important for several reasons. Weight control efforts may depend in part on how accurately individuals perceive their weight status (Bennett and Wolin 2006). Research evidence suggests that self perceptions of body size are associated with emotional and behavioral responses related to body weight (Peratakul et al. 2002). For instance, overweight and obese individuals who do not perceive themselves as being overweight may be less inclined to engage in lifestyle and behavioral changes aimed at weight loss (Gregory et al. 2008).

Cultural factors related to body size preference may influence individual perceptions (Cachelin et al. 2002). Some evidence indicate that socio-cultural factors drive the standards of desirable body weights within cultures, which in turn drive behaviors related

to weight loss such as dieting and increasing physical activity (Paeratakul 2002).

Individuals who are part of cultures that do not equate thinness with attractiveness may view weight loss as a less motivating factor for increasing physical activity levels (Yancey et al. 2006). Among white women, there is a great cultural pressure to be thin; such cultural pressures have been related to greater incidence of eating disorders and attempts at weight control (Gluck and Geliebeter 2002).

Other studies suggest that black men and women have a greater social acceptance of larger body sizes than do white women and men (Cachelin et al. 2002; Bennett and Wolin 2006). Similarly, black women who perceive themselves as overweight are more likely to consider themselves to be physically attractive than white women and report less dissatisfaction with their bodies than do white women (Paeratakul et al. 2002, Cachelin et al. 2002).

In line with this focus, Dorsey, Eberhardt and Ogden (2008) assessed the relationship between weight misperception and race/ethnicity among a sample of adults aged 20 and over who participated in the 1999-2006 NHANES survey. Results from their analysis indicated that approximately 40% of underweight and overweight respondents believed they were about the right weight compared to approximately 8% of obese respondents believed they were about the right weight. These findings indicate that approximately 48% of the sample misperceived their weight. Among individuals with a healthy weight, non-Hispanic blacks were more likely to consider themselves underweight than whites, who were the most likely group to believe they were overweight. Similar to findings in other studies (Cria et al. 2008; Yancey et al. 2006; Bennet and Wolin 2006; Paeratakul et al. 2002), non-Hispanic blacks had higher prevalence of misperceptions than whites.

Among overweight and obese men, the odds of misperception were significantly greater for non-Hispanic blacks compared to non-Hispanic whites, and for people with less than a high-school education compared to persons with some college education. Among underweight and normal weight individuals, women and whites were most likely to perceive that they were overweight (Dorsey, Eberhardt and Ogden 2008). The findings by Dorsey, Eberhardt and Ogden (2008) are relevant to the questions to be explored in this thesis since they suggest that blacks have different perceptions related to weight standards in comparison to whites. The findings by Dorsey, Eberhardt and Ogden (2008) suggest that perceptions vary by race and gender.

In a similar study, Cria et al. (2008) examined the agreement between respondents BMI and their perceived weight status. Specifically, they also examined the association between underassessment of weight status and various demographic characteristics including gender and race. In addition, they examined the association between underassessment of weight status to self rated general health, and perception of health risks. Estimates were based on data derived from the 2004 Consumerstyles and Healthstyles survey which assessed a manifold of questions related to consumer habits, health behaviors, and attitudes. Stratified random samples of 4,345 adults were included in the analysis. Results from Cria et al. (2008) analysis indicated that men were more likely than women to under-assess their weight. Women were also more likely to recognize the extent to which they were overweight. Among overweight and obese groups there was a strong association between underassessment of weight and disagreement that their current weight was a health risk. With respect to race/ethnicity, overweight non Hispanic blacks were more likely to under-assess their weight than non

Hispanic whites; however these patterns did not remain for obese participants. Among obese participants, lower income was a significant determinant of underassessment for women only. In this study gender, race/ethnicity, education and income were all associated with underassessment of body weight (Cria et al. 2008).

In an earlier study, Yancey et al. (2006) examined ethnic and sex differences in overweight self-perception and their association with sedentariness in a representative sample of adults aged 18 and over who participated in the 2002 to 2003 County Health Survey. Results from their bi and multi-variate analysis indicated that overweight African Americans were less likely to perceive themselves to be overweight than overweight Latinos and whites. They also found that participants who perceived themselves to be overweight, regardless of BMI, were more likely to be sedentary than those who perceived themselves as average weight. Among men, blacks, and Hispanics, overweight self perception was associated with sedentary behavior. In this study women were also more likely to perceive themselves as overweight than men (Yancey et al. 2006). Since this study is cross sectional, it is difficult to determine whether perceiving ones self as overweight diminishes motivation to be inactive, if inactivity increases negative self perceptions, or if there is a situation where these factors interact.

Bennett and Wolin (2006) systematically examined whether racial/ethnic differences existed in perceived weight status in a population of overweight adults who participated in the 1999-2002 NHANES survey. They used logistic regression to examine the likelihood of misperception of weight overall, by BMI class, and jointly by BMI class and gender. They found that blacks were the most likely racial/ethnic group to misperceive their weight compared to whites who were the least likely to misperceive

their weight. This relationship was found independent of socio-demographic factors, individual socioeconomic position, and self-reported receipt of a physician diagnosis of overweight (Bennett and Wolin 2006).

The prevalence of weight status misperception was higher among the overweight than among obese participants for both men and women across racial categories. Overweight black women were most likely to misperceive their weight compared to obese white women who were the least likely to misperceive their weight. Obese Blacks compared to obese whites were more likely to categorize themselves as being “about the right” weight. When men and women were analyzed separately, overweight Black women were twice as likely as overweight white women to misperceive their weight. Among obese women, blacks were over three times as likely as white women to misperceive their weight. The findings in this study are similar to the previously mentioned studies in that blacks were significantly more likely to misperceive their weight than whites.

Paeratakul et al. (2002), examined self-perceived overweight in relation to sex, race/ethnicity, income, and education in a representative sample of U.S. adults aged 20 years and older who participated in the 1994-1996 Diet and Health Knowledge Survey (DHKS) and the Continuing Survey of Food Intakes by Individuals (CSFII). The proportion of individuals who perceived them self to be overweight was calculated, stratified by sex, race/ethnicity, household income, and education. Comparison of the proportions of individuals with perceived overweight was made across BMI categories.

Results from their analysis indicated that the self-perception of overweight was significantly higher in women than men and in whites than Blacks across all weight categories. The odds of self-perceived overweight were significantly higher in women,

whites, persons with higher BMI, income, and education compared with their counterparts. They found that white women were most likely to report that they were overweight compared to black men who were the least likely group to report that they were overweight (Paeratakul et al. 2002). Both the correct and incorrect perceptions of overweight were more common in normal weight and overweight white women than in other groups. More overweight and obese white men correctly perceived their overweight status compared with black men. They also found that obese black men had a lower perception of overweight than obese black women. The results reported in this study were consistent with previous studies which were conducted using data derived prior to 1992 (Paeratakul et al. 2002).

Kruger et al. (2008) examined the association of body size satisfaction on being regularly active in a population based representative sample of 10,021 adults aged 18 and over who participated in the 2002 (NPAWLS) National Physical Activity and Weight Loss Survey. This survey conducted by the University of South Carolina Prevention Research Center was offered in English and Spanish and excluded individuals who did not live in telephone equipped locations. Chi square-tests were used to compare frequencies of body size satisfaction across physical activity levels and covariates including race/ethnicity, sex, and BMI. Results from the analysis indicated that Hispanic men and women were the most satisfied with their bodies followed by blacks and whites. Normal weight individuals were the most satisfied with their body size, controlling for covariates. Among men, 37.6 % who were overweight and 13.4% who were obese reported being very satisfied with their body size. Among women, 15.3% who were overweight and 6.1% who were obese reported being very satisfied (Kruger et al. 2008).

Among men and women, those who considered themselves to be very satisfied with their bodies were significantly more likely to be regularly active, regardless of BMI, compared to those who were not satisfied. Once the analysis was stratified by race/ethnicity, there was a significant association between body size satisfaction and being regularly active in whites but was non-significant in blacks, Hispanics, or other race/ethnicities (Kruger et al. 2008). Though this study does not examine weight perceptions per se, the finding that body size satisfaction is not related to being regularly active for blacks but is for whites suggests that the influences of physical activity behavior may be bounded in racial and ethnic cultural attitudes related to desirable and healthy body weight (Kruger et al. 2008). This study is relevant to the questions in this thesis which seek to explore perceptions and behavior, specifically physical activity, in relation to race/ethnicity and gender.

Cachelin et al. (2002) examined body image and body size assessments in a large sample of men and women of four races/ethnicities: black, Hispanic, Asian, and white. Results from their analyses indicated that white women chose a somewhat thinner female as attractive to men than did black women. White women chose the thinnest figure and black men the heaviest female figure as attractive to men. Most ethnic differences in body image and perceptions of attractive and acceptable female body size disappeared once differences in age, educational level, and BMI were controlled. Although ethnic differences did exist, factors such as SES, age, and BMI emerged to be more powerful determinants of body-size perceptions than race/ethnicity. Because this study relied on data which were cross sectional, the results from this study can not infer whether cultural acceptance of larger sizes may produce the tendency to be overweight in the first place.

Also, it is important to note that this study relied on a representative sample of adults who were recruited from urban areas in Los Angeles (Cachelin et al. 2002). Though this study does not address weight perception concordance in the sample of respondents, it is relevant because it addressed body dissatisfaction, attractive male and female shapes, acceptable female size, and perceptions of underweight to obese female figures. The main findings did not support the hypothesis that there are ethnic differences in body size or that there is tolerance of larger body sizes by blacks, which would generate subcultures that accept obesity.

All of the previously mentioned studies were cross-sectional and correlational in design, thus making them unfit to address causality. These studies all utilized nationally representative samples of individual living in the United States. Body Mass Index (BMI) cutoff points used to determine ones weight status in the concordance studies which were reviewed may be arbitrary measures of an individual's weight composition of fat distribution relative to muscle (Yancey et al. 2006).

#### *Structure and Subsequent Obesity Risks related to Race/Ethnicity and Gender*

This section examines various structural factors that relate to the disproportionate prevalence of overweight and obesity among black women and men. In order to better understand the factors that contribute to the obesity epidemic, it becomes necessary to consider individual characteristics alongside environmental (structural) characteristics (Boardman, Saint Onge, Rogers, and Denney 2005). Environmental characteristics can be understood in terms of a “physical space as well as community attitudes and behaviors that characterize these places” (Boardman, Saint Onge, Rogers, and Denney 2005:229).

Communities vary with regards to neighborhood socio-economic status, neighborhood quality, neighborhood safety, available resources, and overall neighborhood environment (Massey and Denton 1994). Black urban neighborhoods in contrast to white neighborhoods represent exceptionally disadvantaged social environments (Massey and Denton 1994). Such environments are characterized by weak neighborhood ties, few internal resources, more stressful day-to day interactions, higher levels of crime, and incivilities which reflect physical/ social signs of decline (Wandersman and Nation 1998). Blacks continue to be the most segregated racial group, regardless of individual socio-economic status, consequently suffering a manifold of consequences resulting from spatial isolation (Massey and Denton 1994). Dissecting such variations can lend insight as to why different populations making up respective environments vary with regards to rates of obesity.

Studies repeatedly confirm that obesity is more prevalent in socio-economically disadvantaged neighborhoods and in neighborhoods where social disorder is apparent (Burdette and Hill 2008, Boardman et al. 2005, Robert and Reither 2004). Neighborhood incivilities and social disorder are factors known to impact feelings of safety, fear of crime, and fear of criminal victimization (Wandersman and Nation 1998). Wandersman and Nation observed that “fear is highest in neighborhoods in which residents perceived high levels of incivilities”(Wandersman and Nation 1998: 649). Neighborhood incivilities, which signify social disorder, are a common reality in disadvantaged African American communities (Wandersman and Nation 1998; Massey and Denton 1994).

Stressful day to day interactions and feeling of safety versus fear in one's community are relevant to this thesis because individual feelings/emotions relate to life-

style risks that can jeopardize residents' ability to maintain a healthy weight (Stimpson et al. 2007). People living in communities characterized by disadvantage and high levels of incivilities tend to cope with environmental related stress and anxiety in ways related to at-risk behavior for obesity, including; not walking outside after dark and eating fatty foods (Stimpson et al. 2007).

According to the Kaplan and Kaplan psychosomatic theory of obesity, "obese people overeat when anxious and eating reduces this anxiety" (Canetti, Bachar, and Berry 2002:159). This theory maintains that obese people have difficulty differentiating hunger from anxiety; consequently people eat in response to both states (Canetti, Bachar, and Berry 2002). According to this theory, people who eat to reduce anxiety may become obese as a result of compulsive overeating (Canetti, Bachar, and Berry 2002). Similarly, Bruch's theory asserts that people "overeat in response to 'emotional tension' and 'uncomfortable sensations and feelings' " (Canetti, Bachar, and Berry 2002:162). Corresponding to theory, it is established that changes in emotions are related to changes in eating behavior (Canetti, Bachar, and Berry 2002). Canetti, Bachar, and Berry (2002) reviewed the influence of emotions on eating behavior; they reported that people experiencing negative emotions have a greater tendency to consume junk food.

Canetti, Bachar, and Berry pointed out that anger, specifically, is associated with compulsive eating characterized as "fast, irregular, careless eating directed at any food type available" (Canetti, Bachar, and Berry 2002:158). Ganley (1989) reviewed literature related to emotional eating and obesity and, based on analysis of reports from obese people who sought treatment for their condition and concluded that emotional eating was a commonality among obese patients. He also concluded from his review that a majority

of the studies related to eating and emotion found a strong relationship between overeating and negative emotions/stressful life events (Ganley 1989).

In contrast to white neighborhoods, blacks living in segregated neighborhoods face greater difficulty developing supportive relationships, known to help people cope when under stressful life conditions (Massey and Denton 1994). In black communities black men find it particularly difficult to find jobs with incomes sufficient for supporting a wife and child, making single parenthood a norm (Massey and Denton 1994). Married women, who are disproportionately white, are more likely to “experience less economic hardships, have more social support, and have a more orderly lifestyle than non-married” (Ross and Mirowsky 2003:132); in turn, they are also less likely to be distressed.

The institutional model suggests that residents of disadvantaged communities will have worst health profiles than residents of more affluent communities because of the differentials in relevant health promoting infrastructure and health related services (Boardman et al. 2005). According to the institutional model, high poverty areas are less likely to provide essential structural resources related to maintaining a healthy weight including health care facilities, recreational facilities, and a built-in environment that encourages exercise (Boardman et al. 2005). Poor areas are also likely to have less food markets proportionate to population density; the cost of food is higher; and the quality of food is lower (Boardman et al. 2005).

Social Models suggest that it is important to examine community structures in relation to maintaining a healthy weight (Boardman et al. 2005). According to this model, the community serves as social contexts where sub-cultural values concerning health related behaviors become normative via the imitation processes and through the

internalization of norms and attitudes which exist within the collective lifestyles of the neighborhoods (Boardman et al. 2005). Another related model, the Epidemic Model, suggest that the risks in obesity increase exponentially with the prevalence of obesity in a given area (Boardman et al. 2005).

### *Neighborhood Context, Race, and Obesity*

The following overview of literature describes structural conditions (including social and contextual factors) which relate to varying obesity risks. The articles selected for this part of the review specifically addressed how varying neighborhood structures, nutritional environments, and community designs relate to disproportionate opportunity structures for blacks and whites to maintain a healthy weight

In exploring links between physical spaces, community attitudes and behaviors, Boardman et al. (2005) examined the institutional and social models of neighborhood effects on obesity and race using data from the 1990-1994 NHIS nationally representative survey. Boardman et al. (2005) specifically examined the association between neighborhood characteristics (proportion non-Hispanic black, proportion of poor residents, and proportion of obese residents) and obesity.

Results from the analysis indicated that residing in black and impoverished communities is positively and significantly associated with an increased risk in obesity for adults. They also found that respondents were more likely to be obese if they lived in a community with a high proportion of obese people (Boardman et al. 2005). In a separate analysis, they found that black and white neighborhoods with similar levels of obesity completely eradicated the association between living in a black neighborhood and an individual's risk of being obese. In this case, obesity prevalence served as a mediator

for the relationship between neighborhood racial composition and elevated risks of obesity in Black communities. In turn, racial concentration had an indirect effect on obesity risks (Boardman et al. 2005)

Boardman et al. (2005) explained that high levels of racial concentration may lead to disparate structural and cultural environments for blacks and whites. They concluded that residents of black communities face an increased risk of obesity because important health-related infrastructural resources are disproportionately lacking in their communities. Results from the analysis suggested that the increased risk in obesity among residents of black and white communities is partially due to socio-economic differences in the communities but such risks attenuated when the obesity rate of the neighborhood was considered. They also found that living in an impoverished community increases an individual's probability of being obese net of individual characteristics including gender, income, and education (Boardman et al. 2005). These findings support social models suggesting that disproportionately obese and black neighborhoods may be characterized by more relaxed (less negative) attitudes toward obesity, while contributing additional evidence to support the epidemic model.

Phuong do (2007) conducted a similar study to investigate the potential role that neighborhood context (neighborhood disadvantage, neighborhood educational concentrations, black segregation, and Hispanic segregation) may play in generating racial disparities in BMI and obesity. The data for this study were derived from the NHANES III survey and the U.S. Census. The results from their analyses of women indicated that higher SES was negatively associated with BMI for all racial groups. As expected, black women had the highest BMI scores. No associations for any of the four

dimensions of neighborhood indicators were found for blacks initially. For white women, the only significant coefficients were neighborhood disadvantage and education. When all four neighborhood variables were included together in the model, the neighborhood disadvantage index and Hispanic concentration were no longer significant for any female racial group. For whites, the association between education and BMI remained statistically significant and actually increased. For black females, the statistically significant association only arose once all four dimensions were entered together (Phuong do 2007).

For men, SES was not nearly as strongly associated with BMI as it was for women. The relationship between the four neighborhood characteristics was also different for men. For example, proportion Black and Proportion Hispanic were significant predictors of BMI for black males, whereas, the only significant neighborhood indicator for white men was education. Once all four neighborhood dimensions were simultaneously entered in the model, there was no significant association between education and BMI for men as there was for women. Similarly, the relationship between education and BMI remained for whites. Interestingly, for black men, neighborhood disadvantage was associated with a lower BMI, whereas, a black concentration was associated with higher BMI levels (Phuong Do et al. 2007).

In sum, both individual and neighborhood characteristics contributed to the variations in BMI by race and gender. The relationship between neighborhood context and BMI remained strong when controlling for individual characteristics. The finding that the association between neighborhood context and BMI was stronger for woman than

men suggests that women may be more reliant on neighborhood resources than men (Phuong Do et al. 2007).

Stimpson et al. (2007) utilized the same data as Phuong Do et al. (2007) to examine the association between neighborhood deprivation and health risk behaviors. This study was developed in part to test structural hypotheses linked to social and institutional models which relate to obesity. The structural hypothesis maintains that social norms and institutions may influence health behaviors in a given area (Stimpson et al. 2007). The health behaviors related to obesity included physical activities and serum triglyceride levels (which are associated with high fat diets). Results from the analysis indicated that neighborhood deprivation was associated with increased odds of serum triglycerides and physical inactivity, adjusting for individual socio-demographic variables (Stimpson et al. (2007).

Stimpson et al. (2007) suggested that stressful environments, related to elevated risks for psychological distress, may engender risky behaviors such as eating fatty foods and drinking alcohol as means to cope. Stressful day to day interactions and feeling of safety versus fear in one's community are relevant because individual feelings/emotions relate to life-style risks that can jeopardize residents' ability to maintain a healthy weight (Stimpson et al. 2007). Stimpson et al. suggested that the proliferation of fast-food restaurants coupled with poor access to healthy foods were possible explanations for increased triglyceride levels found in deprived neighborhoods (Stimpson et al. 2007). Though this study did not examine race specifically, it is relevant to the questions in this thesis, which considers the role of behaviors and structure related to maintaining a healthy weight.

In addressing how people use food to cope with stress and emotions, Ozier (2008) conducted a study which sought to identify the causes of overeating among overweight and obese individuals. Ozier (2008) examined constructs from the Eating and Appraisal Due to Emotions and Stress in the model, including emotion and stress related eating, appraisal of ability and resources to cope, and appraisal of outside influences and stressors in relation to overweight and obesity, controlling for demographic variables. Results from the analysis indicated that individuals scoring in the lowest quartiles for emotion and stress related eating were approximately fourteen times more likely to be overweight or obese compared to individuals in the highest quartiles. She concluded that individuals who eat in response to emotions and stress are more likely to be overweight, that eating is a maladaptive coping mechanism for alleviating and dealing with stress and emotions linked to stress play a role in the quantity of food one consumes (Ozier 2008). Although this study did not address race/ethnicity and gender directly, it is relevant in that it infers that there is a relationship between distress, food consumption, and obesity.

Robert and Reither (2005) combined data from 1980 census tracts and wave I of The American's Changing Lives Study, conducted in 1986 by the Ann Arbor, MI: Survey research center, to examine the contributions of individual socioeconomic status and community disadvantage in explaining the higher BMI of Blacks in the US. This study is relevant to the present thesis in that it directly examines individual level factors alongside structural factors which help to explain higher body indexes of black adults in the U.S. Robert and Reither (2005) found that communities with high socio-economic disadvantage were associated with high BMI. This association was found net of age race, individuals SES, smoking, physical activity, stress, and social support. Consistent with

their hypothesis, SES somewhat reduced the association between race and BMI, but did not abolish it. The association between race and BMI remained strong after controlling for individual SES, marital status, and community socio-economic disadvantage (Robert and Reither 2005).

Robert and Reither (2005) concluded that measures of community disadvantage reduce, but fail to eradicate, the black disadvantage in BMI among women. In this study, community black concentration had no statistically significant association with BMI. For men, none of the SES indicators had statistically significant associations with BMI. In testing interactions between race, SES and community disadvantage, a marginally significant interaction existed between two measures, revealing that black men with higher income were more likely to have higher BMI, in comparison to black men in socio-economically disadvantaged communities who had lower BMI scores. Robert and Reither (2005) suggested that black men are likely to perform more strenuous labor than white men, and that this difference may account for the smaller racial differentials in obesity found among men (Robert and Reither 2005).

Others have focused closely on the ways in which race-based residential segregation specifically promotes race differentials in obesity (Chang 2006; Kwate 2007). Using individual level data from the 2000 Behavioral Risk Surveillance System, a nationally representative survey administered by the CDC, Chang (2006) concluded that both individual level factors and neighborhood segregation are associated with BMI. Chang (2006) found that for blacks, segregation is significantly and positively associated with BMI, controlling for aggregate income status. For whites, segregation was not significantly associated with obesity. A main finding in the study was that blacks who

live in segregated metropolitan areas have higher BMI on average and higher risk of being obese than non blacks. These relationships remained strong after individual level factors including education and income were considered (Chang, 2006).

Chang (2006) suggested that social isolation may impede diffusion of health related information and may also concentrate stressors linked to negative coping behaviors which contribute to weight gain and higher rates of obesity among blacks. In this study racial isolation was positively associated with greater odds of being overweight for blacks adjusting for multi-covariates including measures of individual SES. Among Whites there was no significant association between the isolation index and weight status. These findings are contrary to Robert and Reither's (2006) finding that black concentration was not a significant predictor of BMI.

In addressing processes linking perceived neighborhood disorder to obesity, Burdette and Hill (2008) tested whether perceptions of neighborhood disorder were associated with increased risk in obesity. They also tested whether the association between neighborhood disorder and obesity was mediated by physiological, psychological, and behavioral mechanisms. Using data from the 2004 Survey of Texas Adults, Burdette and Hill (2008) found that neighborhood disorder was positively associated with distress net of controls and that neighborhood disorder was also associated with higher levels of physiological distress and poor self-rated overall diet quality. The results from the analysis indicated that psychological distress was associated with higher levels of psychological distress, poor self-rated overall diet quality, and irregular exercise. They concluded that neighborhood disorder is associated with increased odds of obesity and that physiological distress is a statistically significant

mediator of the association between psychological distress and obesity. Burdette and Hill (2008) explained that living in a neighborhood perceived as noisy, unclean, and crime-ridden can be psychologically distressing, which in turn, may increase the risk of obesity primarily, through poor self-rated overall diet quality and irregular exercise.

Using data from the Fragile Families and Child Wellbeing Study, Burdette, Wadden, and Whitaker (2006) tested whether mothers of young children had a higher prevalence of obesity if they lived in neighborhoods that they perceived as unsafe or as having low levels of collective efficacy. Their preliminary analysis indicated that women were more likely to be obese and more likely to have a higher BMI if they were less educated, unmarried, had lower income, or were non-white. The results indicated that white women were more likely to perceive their neighborhoods as being safer and as having more collective efficacy.

The relevant findings of the investigation by Burdette, Wadden, and Whitaker for the present study were that women had higher mean BMI and higher prevalence of obesity as levels of perceived neighborhood safety decreased controlling for socio-demographic variables. In their sample, neighborhood safety emerged as a barrier to physical activity particularly in low income households (Burdette, Wadden, and Whitaker 2006). Burdette, Wadden, and Whitaker (2006) proposed that neighborhoods with low levels of safety may also have a lower availability of healthy foods, thus, compounding the effects of neighborhood on obesity. Burdette, Wadden, and Whitaker (2006) suggested that neighborhood characteristics can influence how and where people spend their time and further indicated that more time spent inside is likely to be associated with increases in food intake and sedentary behavior (Burdette, Wadden, and Whitaker 2006).

Included in the body of studies related to race, community disadvantage and obesity, is literature which considers how relative access to various food outlets relates to consumption of nutritious foods essential to maintaining a healthy weight. Kwate (2008) reviewed the food environment in black neighborhoods, concluding that available resources affect what people eat and subsequent obesity levels.

Research reveals stark differences in the food environment found in black neighborhoods when compared to white neighborhoods (Kwate, 2008). White and wealthy neighborhoods have more than four times the number of large supermarkets compared to predominately black and poor neighborhoods (Robert and Reither 2004). Supermarkets are less prevalent across all minority and lower-income neighborhoods compared to other neighborhoods (Kwate 2008). Supermarket availability is relevant because inadequate access to supermarkets makes it especially difficult to purchase and consume healthy foods when faced with the alternative option: a surplus of convenient cheap fast-food restaurants (Kwate, 2008). Evidence suggests that the availability of healthful products in grocery stores is associated with consumption of low-fat and high fiber foods (Sallis and Glanz 2006).

Powell, Chaloupka, and Bao (2007) examined the associations between communities' racial, ethnic, and income characteristics and the availability of full-service and fast-food restaurants using restaurant data linked to 2000 Census Bureau Data. They found significant differences in the relative availability of fast-food restaurants by the racial and SES composition of the neighborhood. Results from the analysis indicated that high-income neighborhoods had fewer restaurants of all types compared to neighborhoods in all other lower income categories. Analyses related to racial

composition indicated that predominately black neighborhoods had significantly fewer restaurants, both full service and fast food, compared to predominately white neighborhoods. Analyses related to urbanity and race indicated that predominately black neighborhoods had significantly fewer restaurants of all types in urban areas and that black urban neighborhoods had a significantly higher proportion of fast-food restaurants among all available restaurants compared to predominately white urban neighborhoods. In other words, black neighborhoods have significantly less food choices overall and proportionately more fast food restaurants compared to full service restaurants. Powell, Chaloupka, and Bao suggested that racial differences in obesity may be partially attributed to higher proportions of available fast-food restaurants out of total restaurants which exist in predominately black versus predominately white urban neighborhoods.

In addition, racially concentrated communities serve as spatially defined markets vulnerable to racially and economically targeted advertisements which promote unhealthy food options (Henderson and Kelly 2005). Evidence indicates that stereotyping and discriminatory practices influence which groups are targeted by fast food companies; minorities and low-income people are disproportionately targeted in marketing campaigns established in their neighborhoods and in their media (Henderson and Kelly 2005). Henderson and Kelly (2005) documented and compared the types of foods and weight related nutritional claims which were made during television advertisements aired in the general market and the African American market. The content analyses indicated that significantly more food advertisements appeared during African American programs compared to advertisements in general market programs. Henderson and Kelly also found that food advertisements aired during African American programs were more likely to be

for fast-food, candy, soda, or meat and were less likely to be for cereals, grains, pasta, fruits, vegetables, or dessert in comparison to advertisements aired on the general market.

It is important to consider the nutrition/food environment in conjunction with the various constraints to physical activities that are embedded in communities. This is illustrated by Hill and Peters (1998) who found that “a low level of physical activity is associated with a low daily energy requirement and will cause obesity unless food intake is limited accordingly” (p.1372). They argue that it is necessary to make environments more conducive to physical activity in order to stifle the rate of obesity (Hill and Peters 1998). In line with this reasoning, Sallis and Glanz (2006) explain that physical activity is affected by the built environment which includes buildings, transportation infrastructure, elements of land use, community design, and recreational facilities such as parks and trails.

Poorer and segregated communities often lack necessary resources to support sufficient physical activity (Robert and Reither 2004). Robert and Reither noted that residents in impoverished communities generally have access to fewer exercise amenities “and may also have to contend with the threat of violent crime, insufficient police protection, and inadequately lit streets” (Robert and Reither 2004:2423). Ross found that fear is inversely related to physical activity levels; experiencing fear on the streets near ones home and fear of being robbed, attacked, or injured can lead people to limit their physical activities (Ross 1993).

Chang (2006) noted that limited provisions of parks and public recreational facilities coupled with high crime rates can be prohibitive of outdoor activity. Similarly, Stafford et al. (2007) highlighted the contextual and socio-relational determinants of

obesity and found that physical activity is higher in places with “local sport and leisure facilities and in places with attractive scenery and parks and open space with defined ‘destinations’ such as play equipment and cafes” (Stafford et al. 2007:1884). Research by Stafford et al. (2007) suggests that BMI is negatively associated with average sports participation, high street facilities, and proximity to a post office, controlling for age, sex, and social class. High street facilities pertains to various outlets, including health related facilities such as pharmacies, opticians, and dentist, financial services, or other retail facilities. They explain that a high number of street facilities in a given area is favorable for walking (Stafford et al. 2007).

#### *Discrimination, Obesity, and Race*

Puhl and Brownell’s (2001) review of information on discriminatory attitudes and behaviors against obese individuals suggests that there is a strong and consistent pattern of discrimination against obese people. Discrimination against obese people has been documented in employment, education, and health care sectors (Puhl and Brownell 2001). Based on their review of scientific literature, Puhl and Brownell (2001) concluded that a pervasive bias against overweight people exists and can affect the health and well being of those who are victims of weight-based discrimination. Andreyeva, Puhl, and Brownell (2008), focusing on similar issues, reviewed the prevalence and patterns of perceived weight discrimination in the United States. They concluded that the prevalence of weight/height discrimination has increase from 7% in 1995-1996 to 12% in 2004-2006 affecting all population groups except the elderly and reached parity with discrimination levels reported for race and age discrimination.

Carr and Friedman (2005) specifically examined correlates of institutional and day-to-day interpersonal discrimination reported by individuals of all body sizes. The results from their analyses indicated that, compared to normal weight peers, obese individuals are more likely to report institutional and day-to-day interpersonal discrimination, controlling for demographic and socio-economic correlates of obesity (Carr and Friedman 2005). Carr and Friedman (2005) point out that those obese persons who belong to social groups where obesity is more common and socially acceptable may be less likely to experience discrimination than persons who belong to social strata which are less approving. Specifically they suggest that persons who are young, white, female, highly educated, and those with higher socio-economic positions may face more severe consequences than their counterparts. In this study, the effect of the five weight categories did not differ significantly by sex, age, or race for any of the four discrimination outcomes (Carr and Friedman's 2005).

Carr, Jaffe, and Friedman (2008) similarly examined the extent to which body weight affects three types of perceived interpersonal mistreatment and whether such patterns varied by race, social class, and gender. The three types of perceived interpersonal mistreatment examined in their study included (I) disrespectful treatment, (II) harassment/teasing, and (III) being treated as if one has a character flaw (Carr, Jaffe, and Friedman 2008). While controlling for demographic and socioeconomic status, they found that obese I, II, and III persons report significantly higher levels of all three types of perceived mistreatment. In this study blacks reported significantly more frequent mistreatment than whites initially, but their moderation analysis revealed that the obesity stigma is less acute for black men than white men (Carr, Jaffe, and Friedman 2008). The

perception that one had been mistreated was stronger for obese males and females of higher socio-economic status (vs. lower), though the specific types of mistreatment emerged to vary by gender. Among women, none of the race by BMI interaction terms was statistically significant (Carr, Jaffe, and Friedman 2008). They also found that obese professionals report significantly more perceived interpersonal mistreatment than people of lower socio-economic status. The finding from the Carr, Jaffe, and Friedman study are relevant for the present study in that they suggest that intersecting social identities may shape obese Americans perceptions of stigmatizing interpersonal encounters which reflect discrimination (Carr, Jaffe, Friedman 2008).

Though perceptions of discrimination attributed to obesity have been well established (Andreyeva, Puhl, and Brownell 2008; Carr and Friedman 2005; Puhl and Brownell 2001), the extent to which discrimination attributed to overweight and obesity varies by race and gender is less clear (Carr, Jaffe, Friedman 2008; Carr and Friedman 2005). This review of literature suggests that black and white adults do differ in their perceptions related to personal weight (Dorsey, Eberhardt and Ogden 2008; Cria et al. 2008; Bennet and Wolin 2006; Yancey et al. 2006; Paeratakul et al. 2002). Specifically, this review suggests that blacks are more inclined to under-asses their weight in comparison to whites (Dorsey, Eberhardt and Ogden 2008; Cria et al. 2008; Bennet and Wolin 2006; Yancey et al. 2006; Paeratakul et al. 2002). Among the studies which examined perceptions in relation to physical behaviors, Yancey et al. (2006) found that participants who perceive themselves to be overweight, regardless of BMI or race, were more inclined to be sedentary than those who perceived themselves as average weight. Kruger et al. (2008) similarly examined physical activity levels, but did so in relation to

body size satisfaction rather than perceptions of weight status. They found that blacks are generally more satisfied with their body sizes, though heavier on average, and that body size satisfaction is associated with regular physical activity for whites but not blacks (Kruger et al. 2008).

### *Summary*

This review offers several possible explanations as to why overweight and obesity is more prevalent among blacks than whites controlling for individual level factors. It has been well established that black neighborhoods are disadvantaged in comparison to white neighborhoods with respect to socio-economic status, levels of social disorder, structures which foster supportive relationships known to help people cope under stressful life conditions (Massey and Denton 1994), food environments which encourage healthy consumption habits (Kwate 2008; Powell, Chaloupka, and Bao 2007; Henderson and Kelly 2005), and built environments which encourage physical activity (Robert and Reither 2004). Such disadvantages have all been linked to overweight and obesity risks throughout this review.

However what is less clear is whether or not there are significant differences in perceptions and behaviors related to weight and obesity held by black and white adults. The present thesis intends to explore whether black and white adults differ in their perceptions regarding personal weight, perceptions and behaviors related to maintaining a healthy weight, and perceptions of discrimination attributed to personal weight. Though several studies have examined racial ethnic differences in weight perceptions (Dorsey, Eberhardt and Ogden 2008; Cria et al. 2008; Yancey et al. 2006; Bennet and Wolin 2006; Paeratakul et al. 2002), the present study analyzes data from a recently conducted

national poll and, therefore, addresses the assumption that many of the outcomes of previous research may change as the proportion of overweight and obese people increase (Gregory et al. 2008). Furthermore, understanding perceptions may be a key factor related to developing affective interventions aimed at reducing obesity in general and reducing the disparity in obesity for racial and ethnic minorities. Finally, examining the relationship between discrimination and weight status may have implications for obesity policy legislation aimed at reducing discrimination attributable to weight.

## Chapter 5: Method

### *Data*

Data for this study were derived from an Obesity Poll originally conducted by ABC News and Time Magazine in 2004. The purpose of this poll was to assess public opinion on the problem of obesity in the United States. Topics of inquiry were directed at participants' lifestyle/ health behaviors, dietary and exercise habits, the source of the obesity problem, and difficulties related to maintaining a healthy weight. Background information related to individuals weight, height, age, sex, race, and subjective size of their community was included. A total of 1,202 respondents were interviewed by telephone (46.26% males and 53.74% females). The sample was weighted for age, race, sex, and education in order to proportionately match the population in the United States as reported by the U.S. Census Bureau. This sample is representative of adults age 18 and over, living in households, in the 48 contingent states. Sampling of households was conducted using random digit dialing, interviewing the adult present in the household who had the most recent birthday. Researchers acknowledged that females are more likely to be reached by telephone in households; in turn, the interviewers asked to speak with the male of the household 75% of the time.

### *Measurement of Variables*

#### Race

Race and ethnicity is the primary independent variable in this analysis and was self reported in the Obesity Poll. I restricted the racial/ethnic measure to (1) non-Hispanic black and (2) non-Hispanic white adults. The reason for this restriction is due to the

limited sample size of other racial/ethnic groups. Therefore, the total number of adults included in this analysis is 1,029 (909 whites and 120 blacks).

### Gender

Gender is coded: females =0 and males=1.

### Weight Status - Body Mass Index (BMI)

Weight status by the Body Mass Index (BMI) score. Respondents were asked to report, as accurately as possible, their weight (in pounds) and height (in feet and inches with their shoes off). Each respondent's Body Mass Indexes (BMI) was calculated using self reported measures of height and weight. Individuals with BMI scores <18.5 were considered underweight; individuals with a BMI score between 18.5 and 24.9 were considered healthy weight; individuals with a BMI between 25.0 and 29.9 were considered overweight; and individuals with BMI score  $\geq 30$  were considered obese.

### Perception of Body Size

This measure was based on responses to the following question: How would you describe your own personal weight situation right now? The responses are coded as follows: 1=very overweight, 2= somewhat overweight, 3 = about right, and 4= underweight.

### Perceptions Related to Weight and Obesity

These measures were based on responses to the following questions: (A) What is the hardest thing about losing weight for you personally? Responses were coded such that 1= having the will power, 2=having enough time, 3= knowing what to do, 4= paying for healthy food, 5=taking the trouble to count calories, 6=doing physical exercise;

(B) Individuals were asked to report whether or not they thought that each item listed below is (1) an important or (0) not a very important cause of obesity in this country. The list of items included: a) poor eating habits, b) restaurant portions that are too large c) watching too much television d) not getting enough physical exercise e) genetics or family history f) lack of information on good eating habits g) lack of information about food content h) the marketing of sweets and other high-calorie foods to children i), and the cost of buying healthy food.

(C) The following questions with binary responses were coded so that 0= no and 1= yes. Would you like to loose weight? Do you feel that you probably get as much physical exercise as you should?

*Behaviors Involving Weight*

The following questions measure consumption behaviors of black and white adults. These questions include: About how often in an average week do you eat a meal at any restaurant? About how often in a week do you eat a meal from a fast-food restaurant? Responses were coded so that 1 indicates never, 2 indicates less than weekly, 3 indicates one time a week, 4 indicates two times a week, and 5 indicates 3 or more times a week.

Responses (either “yes” or “no”) to the following questions measured how well respondents keep track of what they consume: Do you try to keep track of the calories you consume in your daily diet, or is that something you don’t pay much attention to? Do you try to keep track of the fat content in your daily diet, or is that something you don’t pay much attention to? Do you try to keep track of the amount of carbohydrates in your daily diet, or is that something you don’t pay much attention to? Do you keep a supply of

fresh fruits and vegetables in your house, or is that something you don't get around to much?

Responses to the following questions which addressed behaviors specifically related to physical activity were also included: Do you find time to get exercise in a typical week? Responses were coded so that 0 indicates no and 1 indicates yes.

Respondents who indicated that they find time to get exercise in a typical week were then asked whether their exercise was more likely to be vigorous or moderate? Responses were coded so that 0=vigorous and 1=moderate. Responses to the question "about how many times a week do you exercise?" were coded so that 1= one to two times a week, 2= three to four times a week, 3= five to six times a week, and 4= seven or more times a week. Respondents were also asked the following questions: Have you followed any weight loss diet plans in the past, or not? How many times in the past? Responses were categorized so that: 0 indicates never, 1= one time, 2 = two times, 3= three to five times, and 4 =six or more times.

### Discrimination

The following question is used to capture whether black and white adults differ in encountering discrimination attributable to their weight: Have you ever felt you were discriminated against because of your weight, or not? Responses were coded so that 0=no and 1=yes. This question is pertinent to this thesis in that it addresses whether or not black and white adults differ in their perceived consequences attributed to weight.

The question, "If you honestly assessed yourself would you say that you have at least some negative feelings about people who are overweight?" assesses whether black

and white adults differ in their feelings about people who are overweight. Responses were coded so that 0= no and 1= yes.

### Structural Factors

To address the structure of the community in which respondents lived, they were asked: “Would you describe the area in which you live as a (1) large city (2) Suburb or (3) Small Town.” Responses were dummy coded so that 1= large city and 0=otherwise.

Individuals assessment of whether or not they thought each of the following structural constraints was (1) an important or (0) not an important cause of obesity in this country: a) Lack of information on good eating habits b) Lack of information about food content c) The marketing of sweets and other high-calorie foods to children d) The cost of buying healthy food.

### Individual Factors

The regression of BMI on individual factors include: Whether individuals feel that they get enough exercise, which is coded so that 1= yes and 0= no, and the average number of times one exercises in a typical week, which is coded so that 1=1, 2=2,, 3=3, 4=4, 5=5, 6=6, 7=7 or more times a week.

### Control variables

Income is coded as follows: 1= <20 thousand, 2= 20 to 35 thousand, 3= 35 to 50 thousand, 4= 50 to 75 thousand, and 5= 75 thousand or more.

Education is coded so that 1=8<sup>th</sup> grade or less, 2= some high-school, 3=graduated high-school, 4= some college, 5= graduated college, and 6= post graduate.

Age groups is categorized so that 1= 18-30 years old, 2= 31-44 years old, 3=45-60 years old, and 4= 61 and over.

## Chapter 6: Results

The results based on an analysis of the ABC poll data are reported in this section. First, I employ a bivariate analytical technique (contingency table analysis) to assess the relationships between respondents' BMI and their race and gender. Second, I use this same technique to examine the relationship between race and the selected perceptions and behaviors. Third, I use Ordinary Least Squares regression (OLS) to assess the relationships between personal weight status and individual and structural factors. Lastly, I examine whether perceptions and attitudes regarding weight based discrimination differ for black and white adults using the bivariate technique described above.

The BMI categories of white and black males and females are presented in table 1. Respondents with BMI scores which fell into the "underweight" category were omitted from the analysis. Black females were more likely than white females to be overweight or obese, while there were no statistically significant differences in BMI by race for males ( $X^2=18.546$ ; 4 df;  $p \leq .001$ ). As Table 1 shows, there is nearly twice as many obese black females as obese white females, 30.6% of black females are obese in comparison to 15.7% of white females. The differences in overweight status were not as disparate; approximately 37% of black females are overweight compared to 24.4% of white females.

Respondents self perceived weight status is presented by race and gender in table 2. There were no significant differences in perceptions of personal weight status for males by race, though there were significant differences by race for females ( $X^2=8.694$ ; df 3;  $p < .05$ ). A Table 2 indicates, 13.2% of black females see themselves as very overweight compared to 6.4% of white females. This finding suggests that black and

white obese females under perceive their weight status. According to BMI cut-off points, approximately 30% of black women in this sample were actually obese compared to 14.7% of white females. The body weight perception finding suggest, when contrasted with actual BMI categories presented in table 1, that white women were more likely to overestimate their weight status compared to black women. Approximately 38% of white women considered themselves to be somewhat overweight when in actuality only 22.8% of white females in the sample were considered overweight.

The eating out habits of white and black males and females are presented in table 3. There were no statistically significant differences by race and gender in eating out at fast-food outlets; however, there were differences in eating out habits in restaurants by race for males. White males were more likely to eat out at restaurants than black males. As table 2 shows, 31.9% of white males eat out at restaurants three or more times a week compared to 13.5% of black males ( $X^2=10.581$ ; df 4;  $p< .05$ ).

Food consumption related behaviors by race and gender are presented in Table 4. There were no significant differences in behaviors related to keeping track of calories, fat, carbohydrates, and supplies of fresh fruits and vegetables by race for males. There were also no differences in such behaviors by race for females, with the exception of keeping track of fat. Approximately 56% of white females reported that they keep track of the fat they consume compared to 36.8% of black females ( $X^2=9.110$ ; df 1;  $p< .01$ ).

Table 5 presents perceptions and behaviors related to maintaining a healthy by weight by race and gender; specifically, ones desire to loose weight, perception of whether one finds time to get exercise in a typical week, and whether the exercise is more likely to be vigorous (not modest) is included in the table. As table 5 indicates, there are

no differences in those perceptions and behaviors by race for females. Though, there are differences in those behaviors by race for males. Significantly more white males find time to get exercise in a typical week compared to black males ( $X^2=6.424$ ; df 1;  $p \leq .01$ ), however, black males who find time to get exercise in a typical week are more likely to exercise vigorously than white males ( $X^2=4.294$ ; df 1;  $p < .05$ ).

Table 6 presents the average number of times respondents exercise in a typical week by race and gender. White females were more likely to report that they exercise 5 to 6 times a week, as were white males. Approximately 28% of white males reported that they exercise 7 or more times a week compared to 8.6% of blacks males. There were significant differences in race for females ( $X^2=13.422$ ; df 3;  $P < .001$ ), as there were for males ( $X^2=14.458$ ; df 3;  $P < .01$ ).

The number of times respondents have followed a weight-loss diet plan in the past by race and gender is presented in table 7. White women were the most likely group to have followed a diet plan more than 3 times. However, as table 7 shows, there are no significant differences by race for males or females.

Table 8 presents respondents perceptions related to the hardest thing about losing weight. Having the will power was the most common response among blacks and whites for both males and females. There were no significant differences by race for males or females related to perceptions of the hardest thing about losing weight.

Perceptions related to whether respondents view the following items as an important cause of obesity : a) Poor eating habits b) Restaurant portions that are too large c) watching too much television d) Not getting enough physical exercise e) genetics or

family history f) Lack of information on good eating habits g) Lack of information about food content h) The marketing of sweets and other high-calorie foods to children and i) The cost of buying healthy food is reported by race and gender in table 9.

There were significant differences in the perception that poor eating habits are an important cause of obesity by race for females but not males ( $X^2=4.470$ ;  $df\ 1$ ;  $p<.05$ ). Approximately 90% of white females viewed poor eating habits as an important cause of obesity compared to 80.6% of black females. There were no differences by race and gender in perceptions that an important cause of obesity is that restaurant portions are too large.

However, there were significant differences by race for males and females in the perception that watching too much television is an important cause of obesity. As table 9 indicates approximately 64% of white females viewed watching too much television as an important cause of obesity compared to 50.7% of black females ( $X^2=4.144$ ;  $df\ 1$ ;  $P<.05$ ). Fifty nine percent of white males viewed watching too much television as an important cause of obesity compared to 40.0% of black males ( $X^2=6.585$ ;  $df\ 1$ ;  $p<.01$ ).

There were no significant differences by race and gender in the perception that not getting enough physical exercise is an important cause of obesity. Though there were differences in the perception that genetics is an important cause of obesity by race for males ( $X^2=9.881$ ;  $df\ 1$ ;  $p<.01$ ). Black males (64.7%) were more likely to perceive genetics as an important cause of obesity compared to 41.6% of white males.

Black males and females were more likely than white males and females to view lack of information on good eating habits as an important cause of obesity. Approximately 43% of white females viewed lack of information on good eating habits

as an important cause of obesity compared to 58.2% of black females ( $X^2=5.537$ ; df 1;  $p \leq .01$ ). Approximately 38% of white males viewed lack of information on good eating habits as an important cause of obesity compared to 67.3% of black males ( $X^2=16.277$ ; df 1;  $p < .001$ ).

Black males and females were also more likely than white males and females to view lack of information about food content as an important cause of obesity. Approximately 43% of white females view lack of information about food content as an important cause of obesity compared to 58.2% of black females ( $X^2=6.213$ ; df 1;  $p \leq .01$ ). For males, 28.2% of whites viewed lack of information about food content as an important cause of obesity compared to 66.7% of blacks ( $X^2= 31.016$ ; df 1;  $p < .001$ ).

There were no significant differences by race for females, as there were for males, in the perception that marketing of sweets and other high calorie food to children as an important cause of obesity. As Table 9 shows, black males (71.4%) are more likely than white males (56.4) to distinguish marketing of sweets and other high calorie food to children as an important cause of obesity ( $X^2=4.071$ ; df 1;  $p < .05$ ).

Lastly, as Table 9 shows, black males and females were also more likely than white males and females to view the cost of buying healthy food as an important cause of obesity. Approximately 69% of black females viewed the cost of buying healthy food as an important cause of obesity compared to 49.7% of white females ( $X^2=8.988$ ; df 1;  $p < .001$ ). For males the differences were similar, 52.8% of black males viewed the cost of buying healthy food as an important cause of obesity compared to 34.1% of white males.

Table 10 presents the results from the regression of Body Mass Index on the following predictors: Race, education, income, age, opinion that you get enough exercise

as you probably should, the average number of times individuals exercise in a week, resident of a large city, sense that lack of information on good eating habits and lack of information on food content is a cause of obesity, sense that marketing of unhealthy foods is a cause of obesity, and the idea that the cost of buying healthy food is a cause of obesity. As model 1 in Table 10 shows, race is a positive significant predictor of BMI ( $p < .001$ ). Model 2 includes the addition of the following controls: education, income, and age. Education was a negative significant predictor of BMI ( $p < .01$ ) however, income was not significantly associated with BMI. Age was a positive significant predictor of BMI ( $p < .01$ ). The individual factors included in the third model include the personal opinion that one gets enough exercise they probably should which was a negative significant predictor of BMI ( $p < .001$ ) and the average number of times individuals exercise in a week which was not significantly associated with BMI. Model 4 introduces structural factors, the only significant predictors were negative and included living in a large city ( $p < .01$ ) and lack of information on food content ( $p < .01$ ).

Table 11 presents perceptions related to discrimination by race and gender. There were no differences by race and gender in reports of having felt discriminated against because of the respondents' personal weight situation. However, significantly more white men (48.9%) admitted to having negative feelings about overweight people than black men (32.1%), ( $X^2=5.351$ ;  $df 1$ ;  $p < .05$ ). There were no differences regarding having negative feelings about overweight people by race for females.

## **Chapter 7: Discussion and Conclusion**

Identifying and understanding risk factors which contribute to disparities in healthy weight status, specifically among black and white women, may help to mitigate racial and ethnic disparities in health status as well as the economic repercussions which stem from the hampering effects of obesity on individuals' health status. This exploratory study considered many factors related to understanding causes and consequences of obesity. This study also assessed the congruence between individuals' perceived weight and their BMI status along with individual perceptions of personal and structural constraints related to achieving a healthy weight status. Behaviors related to achieving a healthy weight status were also examined in addition to perceptions of important causes of obesity, experiences related to discrimination attributed to personal weight status, and admitted negative feelings toward overweight people.

The first research question in this thesis was how do black and white adults differ in their perceptions and behaviors regarding weight and obesity? The first perception addressed was respondents' perception of their personal weight status which was compared to actual weight status as specified by computed BMI categories which was calculated using self reports of height and weight. Contrary to previous findings (Cria et al. 2008), I found that proportionately more obese white women under-assessed their weight status compared to obese black women, though there were nearly twice as many obese black women in this sample as obese white women. Black and white obese males similarly under-perceived their weight status but to a greater extent than that of obese females.

Interestingly, I did not find the same race/gender-related differences in overweight individuals. Contrary to findings in other studies (Cria et al. 2008; Bennett and Wolin 2006; Paeratakul et al. 2002), weight status perceptions of overweight black females were relatively intact. Compared to earlier studies, these findings suggest that fewer overweight black females believe they are at a normal body weight, though incongruity in perceived and actual weight status persisted among obese black women. Consistent with other studies (Dorsey, Eberhardt, and Ogden 2008; Paeratakul et al. 2002), white women with normal BMI scores were more likely to over-assess their body size. These findings for men are similar to those in other studies (Yancey et al. 2006; Cria et al 2002) which found that men, regardless of race, were more likely to under-assess their weight than women.

Differences in body weight assessment among black and white females and, males, to a lesser extent, imply that public health messages and interventions aimed at generating awareness of the risks associated with overweight and obesity need to be designed specifically to target specific audiences. Since racial/ethnic and gender subgroups are likely to share different norms and cultural values, suggests that public health messages need to be framed to convey meaning which is relevant and important to the groups which influential messages are directed. Though this study focused on female racial differences in obesity and related factors, it is important to point out that males, both black and white, are failing to recognize how overweight they really are.

Because there is less cultural pressure for males to maintain a normal weight and less stigma accorded to overweight males than women, implies that getting males to acknowledge the true nature of their weight status may not be an effective catalyst for

behavioral changes directed towards weight loss. Rather, it may be especially important for males to recognize the grave health and economic implications which stem from being overweight and obese as a means to motivate healthy physical and dietary habits. Getting individuals to accurately perceive their weight is only a starting point to ameliorating the obesity epidemic. Regardless of gender, people also need to become aware of the practical consequences of being at an unhealthy weight.

The findings in this study regarding important causes of obesity suggest that black females and males face different constraints related to fighting obesity, including a lack of information on how to establish good eating habits, a lack of information on food content, and the cost of purchasing healthy food. Since important information related to maintaining a healthy weight is seemingly lacking among blacks, suggests that there is a heightened need for such educational information to be disseminated in black communities. Possible avenues for dissemination of such information could be in community centers, churches, and schools (especially in science or physical education classes).

For blacks, the costs of purchasing healthy food may be especially problematic when individuals do not understand the repercussions of the alternate choice: to purchase and consume low-priced readily available unhealthy food. This is why it becomes especially important for black people to be well educated and informed of the overarching connection between forming good eating habits and feeling healthy rather than reiterating the connection between dieting to be thin. This connection is particularly important for males, who do not face cultural pressures to be thin and are not valued or judged according to their physical appearance to the same extent as women.

As expected, education was negatively associated with BMI, indicating that individuals with higher levels of education are less likely to be overweight or obese than their counterparts. The relationship between age and BMI was also anticipated: older people were significantly more likely to be obese than younger people. The finding that living in a large city has a significant negative association with BMI was not anticipated. Contrary to literature which suggests that inhabitants of urban communities face greater obesity risks (Chang, 2006), the findings in this study suggest that inhabitants of smaller communities are more overweight. Future research which explicitly addresses community racial contexts and subsequent opportunity structures is needed to provide more conclusive evidence of the relationship between BMI, race, and community context.

It is important to identify limitations of the current study. First, there are limitations to examining BMI as a dependent variable given that BMI cutoff points can be somewhat arbitrary representations of underweight, normal weight, overweight, and obesity. This limitation is especially a problem when values are near the cut-off points, since BMI is a reasonably simple measure of body fat which does not consider body composition (Cria et al. 2008). Given that this study is particularly concerned with understanding differences in obesity among black and white women, it is also relevant to mention that concordance between BMI measures and actual body fat has been shown to vary according to race/ethnicity, gender, and age (Cria et al. 2008). Despite this limitation, BMI remains an acceptable classification tool (CDC 2009). Other limitations are related to the nature of the data analyzed, which was cross sectional in design and not administered to a large enough racial/ethnic population to examine racial groups other than non-Hispanic blacks and whites. This study is also limited by the use of single

questions to assess multidimensional concepts such as perceived weight status, discrimination attributed to weight status, and negative feelings toward overweight people. Lastly, only a limited number of variables were included to assess individual and structural factors in contributing to weight status as determined by the BMI.

Regardless of race or gender, it is necessary for people to have access to affordable healthy foods and to build environments which encourage physical activity. Future research which focuses on environmental factors could help isolate the range of issues and effective approaches related to curtailing the obesity epidemic which varies across communities. In order to create effective intervention strategies, future obesity intervention research should focus on the role that community actions and organizations play to incite healthy lifestyles. Possible economic incentives for food industry/manufactures to produce and distribute healthy foods in disadvantaged communities should also be explored. The way food assistance programs are designed and allocated could also be reconsidered in encouraging consumption of healthy balanced diets.

Finally, information conveyed in food packaging and labeling as well as the role of media, marketing, and advertising in constructing messages about physical beauty, diet and exercise should be examined as proxies for influencing behaviors related to maintaining a healthy weight. In addition, zoning regulations related to structural developments within black communities should be implemented to insure that healthy environments are formed and maintained. Lastly, from the standpoint of implementing effective modes of intervention, the role that schools and worksites play in encouraging diet and physical activity should also be more closely examined.

Table 1: Actual Body Mass Index (BMI) Category by Race and Gender

BMI Category	Females***		Males	
	Whites	Blacks	Whites	Blacks
Obese	16.3	30.6	17.8	30.2
Overweight	25.3	37.1	47.6	30.2
Normal	58.4	32.3	34.6	39.6
Total=	100%	100%	100%	100%
(N=971)	(423)	(62)	(433)	(53)

\*P <.05

\*\*P <.01

\*\*\*P <.001

Note: The “underweight” category is omitted from the above analysis.

Table 2: Self Perceived Weight Status by Race and Gender

Self Perceived Weight Status	Females*		Males	
	Whites	Blacks	Whites	Blacks
Very Overweight	6.4	13.2	2.7	3.9
Somewhat Overweight	38.1	41.2	34.1	19.6
About Right	48.6	45.6	57.8	68.6
Underweight	5.4	6.9	7.8	0.0
Total=	100%	100%	100%	100%
(N=1,029)	(467)	(68)	(443)	(51)

\*P &lt;.05

\*\*P &lt;.01

\*\*\*P &lt;.001

Table 3: Eating Out Habits in Restaurants and Fast Food Outlets by Race and Gender

	Eating Out Habits							
	Any Restaurant				Fast Food			
	Males*		Females		Male		Females	
	Whites	Blacks	Whites	Blacks	Whites	Blacks	Whites	Blacks
Never	10.6	15.4	13.9	23.9	31.6	24.5	36.8	38.2
Less than Weekly	14.9	21.2	18.1	14.9	20.1	20.8	22.1	26.5
One Time a Week	26.2	23.1	33.3	31.3	22.3	34.0	22.5	14.7
Two Times a Week	16.3	26.9	15.1	11.9	11.3	9.4	11.3	8.8
Three or More Times a Week	31.9	13.5	19.6	17.9	14.7	11.3	7.3	11.8
Total	100%	100%	100%	100%	100%	100%	100%	100%
(N=1,030)	(442)	(52)	(469)	(67)	(N=1,031)	(443)	(467)	(68)

\*P <.05

\*\*P <.01

\*\*\*P <.001

Table 4: Food Consumption Related Behaviors by Race and Gender

Food Consumption Related Behaviors (Blacks)	Females		Males	
	Whites	(Blacks)	Whites	
Keeps Track of Calories	43.3	38.2	25.3	30.8
Keeps Track of Fat	56.3**	36.8	37.5	48.1
Keeps Track of Carbohydrates	42.9	38.8	26.0	23.1
Keeps a Supply of Fresh Fruits and Veggies	91.2	91.0	85.3	84.6

\*P &lt;.05

\*\*P &lt;.01

\*\*\*P &lt;.001

Table 5: Perceptions and Behaviors Related to Maintaining a Healthy Weight by Race and Gender

Perceptions and Behaviors Related to Weight	Females		Males	
	Whites	Blacks	Whites	Blacks
Would Like to Lose Weight	69.1	64.2	49.7	39.6
Find Time to Get Exercise in a Typical Week	76.8	72.7	81.0**	66.0
Exercise is more likely to be Vigorous (not modest)	28.1	39.6	33.5 *	51.5

\*P <.05                      \*\*P <.01                      \*\*\*P <.001

Table 6: Average Number of Times one Exercises in a Week by Race and Gender (Behaviors)

Times in a Week one Exercises	Females**		Males**	
	Whites	Blacks	Whites	Blacks
1 to 2 times a week	8.1	18.4	7.6	22.9
3 to 4 times a week	40.4	49.0	40.3	51.4
5 to 6 times a week	27.0	6.1	24.6	17.1
7 or more times a week	24.5	26.5	27.5	8.6
Total=	100%	100%	100%	100%
(N=800)	(359)	(49)	(357)	(35)

\*p &lt;.05

\*\*p &lt;.01

\*\*\*p &lt;.001

Table 7: Number of Times Respondents Followed a Weight Loss Diet Plan in the Past by Race and Gender (Behaviors)

Times Followed a Weight Loss Diet Plan	Females		Males	
	Whites	Blacks	Whites	Blacks
Has not Tried	59.9	66.2	79.9	94.2
1 time	9.9	14.7	11.7	1.9
2 times	8.6	5.9	3.2	0.0
3 to 5 times	12.0	8.8	3.2	3.8
6 or more times	9.7	4.4	2.0	0.0
Total=	100%	100%	100%	100%
(N=1,029)	(466)	(68)	(443)	(52)

\*P <.05

\*\*P <.01

\*\*\*P <.001

Table 8: Personal Perception about the hardest thing about Losing Weight

Hardest thing about Losing Weight	Females		Males	
	Whites	Blacks	Whites	Blacks
Having the Willpower	43.5	42.9	41.5	19.0
Having Enough Time	20.5	19.0	20.8	33.3
Knowing What to Do	3.2	7.1	4.3	9.5
Paying For Healthy Food	7.2	8.2	0.0	11.9
Taking the Trouble to Count Calories	9.5	7.1	13.5	23.8
Doing the Physical Exercise	15.1	11.9	12.6	14.3

\*P &lt;.05

\*\*P &lt;.01

\*\*\*P &lt;.001

Table 9: Important Cause of Obesity in this Country Gender (Perceptions)

Important Cause of Obesity	Females		Males	
	Whites	Blacks	Whites	Blacks
Poor Eating Habits	89.5*	80.6	82.5	77.4
Restaurant Portions are too large	51.9	53.0	34.3	46.0
Watching too much Television	63.7*	50.7	59.0**	40.0
Not Getting Enough Physical Exercise	87.2	86.8	83.5	88.5
Genetics	54.6	61.2	41.6**	64.7
Lack of Info on Good Eating Habits	42.9**	58.2	38.2***	67.3
Lack of info about Food Content	36.4**	52.2	28.2***	66.7
Marketing of Sweets/High-calorie food to Children	72.0	70.1	56.4*	71.4
The Cost of Buying Healthy Food	49.7**	69.1	34.1**	52.8

\*P &lt;.05

\*\*P &lt;.01

\*\*\*P &lt;.001

Table 10: Regression of Body Mass Index on the following predictors: Race, education, income, age, opinion that you get enough exercise as you probably should, the average number of times individuals exercise in a week, resident of a large city, sense that lack of information on good eating habits and lack of information on food content is a cause of obesity, sense that marketing of unhealthy foods is a cause of obesity, and the idea that the cost of buying healthy food is a cause of obesity.

	Model 1	Model 2	Model 3	Model 4
Race	.467*** (.123)	.452*** (.121)	.426*** (.119)	.498*** (.121)
Education		-.118** (.038)	-.127*** (.037)	-.135*** (.038)
Income		-.052 (.031)	-.054 (.031)	-.062* (.031)
Age		.075** (.030)	.099*** (.031)	.098** (.031)
Exercise			-.255** (.094)	-.238** (.093)
Time Exercise			-.035 (.025)	-.037 (.024)
Large City				-.241* (.098)
Lack Healthy Eating Habit Info.				.043 (.092)
Lack Food Content Info.				-.237** (.096)
Marketing Unhealthy Foods				.045 (.089)
Healthy Food Cost				.036 (.087)
R <sup>2</sup>	.206	.358	.402	.443
Adjusted R <sup>2</sup>	.040	.117	.146	.168

\*P <.05                      \*\*P <.01                      \*\*\*P <.001

Table 11: Perceptions Related to Discrimination by Race and Gender

Perceptions Related to Discrimination	Females		Males	
	Whites	Blacks	Whites	Blacks
Has Negative Feelings about Overweight people	39.7	36.4	48.9*	32.1
Has Felt Discriminated Against Because of Personal Weight	10.7	9.0	5.9	7.5

\*p <.05                      \*\*p <.01                      \*\*\*p <.001

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