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The Association of Racial Identity and Locus of Control With Eating Attitudes and Obesity in African American College Women

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THE ASSOCIATION OF RACIAL IDENTITY AND LOCUS OF CONTROL WITH EATING ATTITUDES AND OBESITY IN AFRICAN AMERICAN COLLEGE WOMEN

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ABSTRACT

THE ASSOCIATION OF RACIAL IDENTITY AND LOCUS OF CONTROL WITH EATING ATTITUDES AND OBESITY IN AFRICAN-AMERICAN COLLEGE WOMEN

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African-American women have been disproportionately affected by the obesity epidemic in the United States, and studies have suggested that sociocultural factors may have a negative influence on weight and weight loss efforts. Relatedly, other studies have found that African-American women have reported feeling less motivated to lose weight than other ethnic groups. Previous research has also indicated that locus of control plays a role in some health outcomes for African America women. The current study aimed to examine the impact of Black identity, external locus of control, and exercise motivation on obesity in African-American college women. Uncontrolled eating and exercise activity were proposed as mediators, and depression and age were included as covariates.

Results indicated that racial identity, external locus of control, and exercise motivation did not predict obesity in this population. Depression and age were, however, significantly associated with obesity. Future studies should explore other aspects of culture for African-American women that may influence obesity and motivation to engage in healthier behaviors. Additionally, an examination of factors that contribute to depression and weight for this population would also prove beneficial for more culturally sensitive obesity interventions.

This dissertation is dedicated to my baby daughter, Eliza James. Thank you for giving me the motivation and focus, if not the sleep, necessary for finishing my degree. You are the very best.

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TABLE OF CONTENTS

APPENDICES

LIST OF TABLES

LIST OF FIGURES

Figure Page

CHAPTER I

LITERATURE REVIEW

According to the National Center for Health Statistics, the rate of overweight and obese individuals has increased steadily since 1960 (Ogden & Carroll, 2010). This is true for both sexes and various ethnic groups. The disproportionate impact of the obesity epidemic on the African-American community, however, is well-documented (Flegal, Carroll, Ogden & Curtain, 2010; see also Cox et al., 2011; Gary et al., 2004; Kumanyika et al., 2005), and is most critical for African-American women. Beydoun and Wang's (2009) comparison of National Health and Nutrition Examination Survey (NHANES) body mass index (BMI) data from 1988-1994 and 1999-2004 revealed that African-American women had the highest yearly increase in both overall obesity (BMI $\geq$ 30) and abdominal obesity, (i.e., waist circumference; BMI $\geq$ 30). Moreover, prevalence rates of 90.8% for abdominal obesity and 70.7% for overall obesity were projected for African-American women by 2020. Whereas the 2013 overweight rate (30 > BMI $\geq$ 25) for White women 20-74 years of age was 60.9%, it was 81.8% for African-American women in the same age group. The obesity rate (40 > BMI $\geq$ 30) for White women 20-74 years of age was 32.3%, and the corresponding obesity rate for African-American women was 57.5% (Ogden, Carroll, Kit, & Flegal, 2014).

The prevalence rates of overweight and obesity increase with women's age until approximately age 60, when it begins to decline (Ogden et al., 2014). An examination of NHANES data from 2011-2012 revealed that White women age 12-19 had a High Body Mass Index ($\geq 85^{th}$ percentile) rate of 31% whereas African-American women age 12-19 had a High Body Mass Index rate of 42.5%. The rates jump to 55% for White women between 20 to 39 years of age, and to 80% for African-

American women age 20-39. Prevalence rates continue to increase in women 40-59, with rates of 69.1% for White women and 85.2% for African-American women. Rates then slightly decline to 67.9% and 80.2% in White and African-American women 60 and older (Ogden et al., 2014). The worsening of rates as women move into middle age and beyond suggests that targeting younger women could be effective in curtailing the upward trend in High BMI prevalence. The purpose of this study was to explore factors that contribute to the significantly high rates of overweight and obesity in young adult African-American women and that could inform the development of effective early interventions.

Health Effects of Obesity

Exploring factors that contribute to obesity in this population is important because, unsurprisingly, African-Americans have higher morbidity and mortality rates related to obesity and obesity-related disease. There is a higher prevalence of cerebrovascular diseases among African-Americans (American Heart Association [AHA] 2013; Lloyd-Jones et al., 2010) and potentially double the risk of osteoarthritis of the knee (Rattue, 2011). The rate of cardiovascular diseases (CVD) among African-Americans is nearly 1 in 2 (44% for men and 48.9% for women) compared to 1 in 3 in the general United States population (AHA, 2013), and the rate of diabetes among African-Americans is estimated at 19.6%, compared with 9.5% among Whites (Centers for Disease Control and Prevention [CDC], 2014). Moreover, African-Americans have higher rates of diabetes-related complications such as blindness, kidney disease, amputations (American Diabetes Association, 2011), and CVD (Chlebowy, Hood, & LaJoie, 2010).

Weight Loss in African-American Women

Numerous health conditions could be partially ameliorated by weight reduction (Kumanyika, 2005). Even a moderate weight-loss of approximately 8% is associated with a reduction in hypertension, diabetes, and need for lipid-lowering medications (The Look AHEAD Research Group, 2007). Avenell et al. (2004) found that in women with obesity-related illnesses, intentional weight loss, irrespective of amount lost, resulted in a reduction in risk of death related to CVD, cancer, and diabetes. In Blissmer et al.'s (2006) study, women who completed a 6-month weight loss intervention were assessed again at 12 and 24 months. At the end of two years, participants regained some weight, only maintaining an average of 3 kilograms of weight loss; however, the maintenance of significant weight loss (>5%) was not necessary for improvements in physical functioning, vitality, general health and mental health.

A significant proportion of African-American women desire to lose weight (Striegel-Moore, Wifley, Caldwell, Needham, & Brownell, 1996), suggesting that the high prevalence of obesity and the BMI gap between African-American and White women does not reflect indifference on the part of the African-American women. Rogers-Wood and Petrie (2010) found that 70% of overweight African-American college women wanted to lose enough weight to be in the normal weight category. Among obese women, 20% wanted to lose enough weight to drop into the normal weight category, 60% reported an ideal BMI in the overweight group, and 20% wanted to remain in the obese category.

Barriers to Weight Loss: Diet, Exercise, and Program Effectiveness

Dietary habits. The deleterious effects of being overweight or obese and the desire of many to achieve a healthier BMI do not, however, necessarily result in significant weight loss. One of the barriers to weight loss among African-American women is related to diet. Obesity and high disease rates are related in part to dietary factors, and dietary modifications can greatly diminish the risk of many chronic diseases (Danaei et al., 2009; He, Nowson, & MacGregor, 2006). According to the U.S. Department of Agriculture's (USDA) Healthy Eating Index (HEI), 28% of African-Americans had a poor diet compared to 16% of Whites and 14% of other racial/ethnic groups (Basiotis et al., 2002). African-Americans report dietary habits high in fat and calories, a high intake of sodium and salt-cured, smoked, and nitrite-cured foods, and a low intake of fruits, vegetables, fiber, and grain (Kulkarni, 2004; U.S. Department of Health & Human Services [DHHS] 2000; See also Kumanyika, 1990). Sodium is particularly problematic as Danaei et al. (2009) found that high dietary salt intake had the largest negative effect among dietary factors and is responsible for 4% of adult deaths. In addition, the USDA reported that only 25% of African-Americans met the recommendation of <30% of calories from daily fat intake (USDA 1996). The USDA recommends 44-77 grams of fat a day and that less than 7% of total daily calories should come from saturated fat (around 3.5 grams a day). Gary et al. (2004) reported an average daily fat intake of 86 grams and the average daily fat intake of saturated fat was 24 grams among their African-American participant pool.

Although the USDA recommends that all Americans should increase fruit and vegetable intake (Ard, Skinner, Chen, Aickin, & Svetkey, 2005), minority populations consume fewer fruits and vegetables than the national average (Gans et al.,

2003; Subar et al., 1995). In a study by Gary et al. (2004), only 8% of African-American participants reported eating at least two servings of fruit per day, and only 16% reported eating three servings of vegetables a day. Similarly, Casagrande, Wang, Anderson, and Gary (2007) found that African-Americans were less likely to meet USDA guidelines for fruit and vegetable intake when compared to White Americans.

Overall, few African-Americans meet the Food Guide Pyramid recommendations: 18% met the guidelines for the grain group; 29% for the vegetable group; 16% for the fruit group; 15% for the dairy group; and 35% for the meat group (James, 2004; USDA, 2002). Hiza, Casavale, Guenther, and Davis (2013) found that African-Americans had lower consumption levels of total vegetables, milk, and whole grains, and higher scores for sodium and saturated fat than Whites. African-Americans also lag behind other American racial/ethnic groups in modifying their diets to fit national recommendations (James, 2004; Stables et al., 2002).

Dietary restraint. Given the literature on food choices among African-Americans, it is also of significance that African-American women have been found to exhibit lower levels of dietary restraint, defined as deliberately limiting one's intake of food. They have also been found to stay on a diet for shorter periods of time than White women, leading to the conjecture that White women are more fervent dieters (Akan & Grilo, 1995; Franko & Striegel-Moore, 2002; Gluck & Geliebter, 2002; Vaughan, Sacco, & Beckstead, 2008). James (2004) and Dietz (2001) found that taste overrode nutritional value among their African-American study participants. In a study by Blixen, Singh, and Thacker (2006), African-American women endorsed food cravings as a barrier to successful weight loss. Davis, Clark, Carrese, Gary, and Cooper (2005) found

that African-American women emphasized preferences for food characteristics (e.g., taste, texture, and type) in a projected ideal weight- loss method, whereas White women emphasized physical activity and made no mention of food characteristics. Schiffman, Graham, Sattely-Miller, and Peterson-Dancy (2000) also found an elevated and sustained preference for sweet foods in African-Americans as compared to European Americans. Similarly, El-Kebbi et al. (1996) reported that lack of taste of low-fat and sugar-free foods were barriers to dietary adherence among African-Americans with diabetes. A lack of dietary restraint is potentially a great contributor to obesity in African-American women: Brewer, Kolotkin, and Baird (2003) found that eating beyond satiation elevated the odds of obesity 6-fold for White women and 15-fold for African-American women.

Exercise. Research has indicated a negative correlation between BMI and physical activity (Eyler et al., 2002), which could disproportionately affect African-American women as they have higher BMIs on average. African-Americans report lower levels of physical activity than Whites or Hispanics (Haskell et al., 2007). Landry and Solmon (2004) identified minority women as the least active segment of the U.S. population and reported that the physical activity patterns of African-American women in particular are especially complex and confounded by other factors. In a qualitative study by Airhihenbuwa, Kumanyika, Agurs, & Lowe (1995), African-American participants espoused the belief that rest is more important than exercise. Eyler et al. (2002) noted that the importance placed on rest over physical activity can be a barrier, as African-American women in two qualitative studies believed they were already sufficiently active in daily activities and did not need more moderate-intensity activities. African-American women across age, income, and occupational groups report less leisure activity (e.g., running, walking for exercise, calisthenics, gardening) and less leisure time muscle strengthening activities than

White women (Schiller, Lucas, Ward, & Peregoy, 2012; Walcott-McQuigg, Zerwic, Dan, Kelley, 2001). Similarly, Crespo, Smith, Andersen, Carter-Pokras and Ainsworth (2000) found that African-American men and women reported a higher prevalence of leisure time inactivity than their White counterparts across numerous variables, including marital status, education, income, poverty, occupation, and employment. In addition, Wallace, Buckworth, Kirby, and Sherman (2000) found that African-American college women were more likely to be sedentary than their White counterparts.

Bish et al. (2005) found that among individuals trying to lose weight, African-American adults were less likely to have reduced calories and also spent less time in leisure-time physical activity than Whites. Davis et al. (2005) found that African-American women made no mention of physical activity when describing their ideal weight loss method, whereas White women emphasized physical activity in their ideal weight loss methods. In Rohm-Young and Voorhees' (2003) survey of 234 African-American women living in Baltimore, 21% met national recommendations for moderate or vigorous physical activity. The negative effects of too little physical activity are compounded due to their impact on metabolic rate throughout the day: After adjusting for body weight, Shook et al. (2014) found that African-American women have a lower resting metabolic rate compared to their White counterparts and that lower cardiorespiratory fitness explained 25% of this difference (i.e., sedentary individuals have a lower resting metabolic rate than individuals who engage in moderate-to-vigorous physical activity).

However, there may be barriers to exercise that are unique to minority women. Research indicates that sweating and messing up one's hair are identified as barriers to physical activity for African-American women, especially during the workday (Airhihenbuwa et al., 1995; Carter-Nolan, Adams-Campbell, & Williams, 1996; Eyler et al., 2002; Walcott-McQuigg

& Prohaska, 2001). In a study of African-American women, physical activity, and hair care, Hall et al. (2013) found that 37.9% of women reported avoiding exercise at times due to hair-related issues, and women with relaxed, or chemically straightened, hair were more likely to avoid doing exercise because of their hair. Similarly, Dietz (2001) found that the amount of money and time that African-American women spend on hair care was one of the top barriers to physical activity. The neighborhoods of minorities might also be less safe for physical activity and exercise: African-American study participants have cited unsafe streets and a lack of facilities and/or equipment for exercise as barriers to physical activity (Dutton, Johnson, Whitehead, Bodenlos, & Brantley, 2005; Eyler et al., 2002; Kumanyika & Grier, 2006).

Effectiveness of weight loss programs. Another possible deterrent to weight loss is that, overall, attempts to lose weight among African-American women tend to be less successful than attempts among White women. On average, African-Americans lose less weight than White participants in the same weight reduction interventions (Hollis et al., 2008; Kumanyika et al., 2005; Kumanyika, Obarzanek, Stevens, Hebert, & Whelton, 1991; West, Prewitt, Bursac, & Felix, 2008). In Epstein et al.'s (2012) Dietary Approaches to Stop Hypertension study, it was found that ethnicity was the only predictor of dietary adherence, with African-American participants less adherent than White participants. In West et al.'s (2008) study, diabetic African-American participants lost the same amount of weight as other participants in a medication (Metformin) condition, but significantly less in the lifestyle intervention condition. African-American women also report finding weight loss programs less helpful for losing weight (Blixen, Singh, Xu, Thacker, & Mascha, 2006).

In a study of White and African-American women attempting to lose weight, Nothwehr (2004) found that African-American women attempting to lose weight reported less self-efficacy and lower outcome expectations, as well as lower usage of multiple weight loss strategies (e.g., preventative measures, immediate management, use of social skills). Shankar, Long-Dilworth, and Cone (2004) also found that although the weight loss goals of African-American and White college women were similar, White women showed greater utilization of every weight loss strategy, with the exception of skipping meals and laxatives, than African-American women. Explanations for differences in weight loss include that African-American women engage in weight loss methods for a shorter period of time (Tyler, Allan & Alcozer, 1997), are less likely to continue to exercise after the intervention, express greater frustration with insufficient results, and are more likely to cite a lack of personal motivation to change at the outset compared to White women (Mattfeldt-Beman et al., 1999). Kieffer et al. (2004) also found that a lack of motivation was a barrier to adapting a health behavior regimen for African-Americans with diabetes. Less motivation to change could prove especially problematic as Love, Davoli, and Thurman (1996) found intention to change to be the most powerful predictor of success in weight loss or regular exercise efforts.

In a 24-week home-based walking exercise study conducted by Wilbur, Michaels, Chandler, and McDevitt (2003) in which program adherence was measured with heart rate monitors and logs, adherence was significantly higher in White women than in African-American women. In a separate study of exercise adherence, Arikawa, O'Dougherty, and Schmitz (2011) found that White women were more adherent (70.3%) than African-American women (48.6%). In a weight loss intervention, Hollis et al. (2008) found that African-American participants attended fewer sessions, reported less physical

activity, and kept fewer food records than Non–African-American participants. Notably, the significant effect of race occurred after the intervention transitioned from supervised exercise (meeting with certified exercise instructor) to unsupervised (exercising on one's own).

Sociocultural Influences on Weight

Health-related attitudes and behaviors are primarily determined by cultural, psychosocial, and economic factors (James, 2004). Several researchers have observed cultural factors associated specifically with being an African-American woman that may influence problematic nutrition and exercise habits associated with obesity. Cultural, family and peer factors are also important when considering attempts at improving health-related behaviors.

Food and social support. Chlebowy et al. (2010) found that support from family and peers promoted adherence to self-management behaviors (e.g., engaging in daily physical activity, following a prescribed diet) among their sample of African-American adults with type 2 diabetes. Moreover, African-American women expressed a greater desire for social support in their weight loss efforts than White women (Blixen et al., 2006a), and indeed, social support exerts a powerful influence on attempts to lose weight and exercise regularly (Eyler et al., 2002; Love et al., 1996). However, James (2004) and Nothwehr (2004) reported that within the African-American community, friends and family are not usually supportive of dietary change. African-American participants in Kieffer et al.'s (2004) study reported that social norms did not support healthy eating or regular physical activity. This may have a substantial negative impact as El-Kebbi et al. (1996) found that lack of family support and family pressure were major barriers to dietary adherence cited by African-Americans with diabetes.

In Blixen et al.'s (2006a) focus group study, African-American women felt that social and family attitudes about food played a crucial role in preventing them from losing weight. For example, African-American women cite male partners and children as barriers to healthy eating. They report that men feel entitled to eat whatever they want after a day at work and that women can be banned from family reunions for bringing a salad (James, 2004, p. 360). African-American participants in Blixen et al.'s (2006a) study similarly observed that people would not come to parties if the hostess cooked less "oily" food (p. 294), and identified preparing large quantities of food as a way of caring for others. Participants in Lynch, Chang, Ford, and Ibrahim's study (2007) expressed the belief that friends liked them less post weight loss, especially if they could no longer shop at the same stores or share clothing. Bagley, Character, and Shelton (2003) note that one aspect of African-American culture is the constant availability of food and its role in increasing environmental comfort. Food is involved at church gatherings, holidays, family reunions, Sunday dinners, events, etc. In Davis et al.'s (2005) study, African-American women identified the prominent role of food across settings (e.g., church, sorority meetings) as well as expectations and beliefs about food, as hindrances to weight loss. Similarly, participants with diabetes in Chlebowy et al.'s (2010) study reported that it is difficult to follow dietary recommendations when food is present within a social context, such as family gatherings.

Cultural food preferences. The African-American women in Blixen et al.'s (2006a) study described a past and current orientation to large quantities of high fat and high salt foods. Bovell-Benjamin, Dawkin, Pace, and Shikany (2009) conducted eight focus groups of African-Americans age 18 to 75 in Alabama and found a preference for high-fat traditional foods: The majority of participants endorsed high consumption of processed, salted, and fried meats. The most common

preparations of vegetables were boiling and frying with the addition of butter. Frying was the most common method for preparing poultry and pork. Participants were more likely to leave the fat on chicken than to remove it, and approximately half of participants reported trimming fats when they prepared meats. Dacosta and Wilson (1996) found that African-American women expressed a greater preference for fried food than White women; and Popkin, Siega-Riz, Haines, and Jahns (2001) reported that African-Americans obtain much of their dietary fat from luncheon meats, bacon and fried poultry. The African-American participants in Kieffer et al.'s (2004) study endorsed diets high in meat and starch. In a study of college women by Shankar et al. (2004), African-American students reported higher fat, cholesterol, and caloric intakes and were more influenced by cultural traditions (48%) than White students (20.4%). In Davis et al.'s (2005) focus group study, African-American women across SES groups identified cultural food types, such as collard greens and fried chicken, as well as abundance and preparation, as hindrances to weight loss. In addition, it is often the cooking methods of the foods (e.g., eating chicken with the skin, seasoning vegetables with fat and meat, not trimming fats from meat, reusing oils, grease, and fats to flavor foods and save money), rather than the foods themselves, that contribute to health issues (James, 2004; USDA, 2000).

Food and African-American identity. Focus groups of African-Americans with diabetes in Kieffer et al. (2004) cited cultural traditions as a barrier to adapting health behavior routines. Similarly, African-American women in Blissmer et al.'s (2006) study believed that their cultural background promoted weight gain significantly more than did White women. In addition, African-American women in Blixen et al.'s (2006b) study indicated that it was significantly more important for weight-loss programs to have information on food common to their culture than did White women. There is a perception that

eating healthy foods means giving up part of African-American cultural heritage and conforming to the dominant culture (James, 2004): soul food is called such "because the foods of the ancestors are believed to nourish the body, nurture the spirit, and comfort the soul" (James, 2004, p. 361). Participants in Antin and Hunt's (2012) study also defined soul food as synonymous with comfort. Liburd (2003) found that the ritualized nature of food selection and eating as well as the meanings inherent in foods and food-centered events in the African-American community may make dietary modifications particularly difficult for African-American women.

James (2004) found that African-Americans did not believe the Food Pyramid reflected the types of food they eat and that health and nutrition messages presented at clinics and hospitals were too general or not culturally relevant to African-Americans. It was acknowledged that traditional foods are not necessarily healthy, but that they bring back good memories of childhood and that not eating them would be a sign of disrespect toward elders. Participants noted that traditional foods are an important part of all cultural groups and moreover, distinguish one group from another. Furthermore, participants in Kieffer et al.'s (2004) study reported not feeling motivated to change their diets because they preferred the taste of culturally-based foods and often disliked healthier options, particularly vegetables. Kittler and Sucher (2008) suggest that culturally based foods are frequently one of the last traditions to change when people move or assimilate into a new culture. In Airhihenbuwa et al.'s (1996) qualitative study, African-American participants expressed the belief that being Black has a strong influence on eating patterns and that African-Americans have similar tastes in food. Similarly, Devine, Sobal, Bisogni, and Connors (1999) found that African-American participants often expressed their ethnic identity through food choice, especially at family gatherings

and holidays. In addition, Ard et al. (2005) found that more traditional African-Americans consumed fewer fruits and vegetables and more calories from fat than less traditional African-Americans. Airhihenbuwa et al. (1996) noted that conventional dietary interventions are less effective with African-Americans than Whites and that some potential areas of difficulty might involve contextual factors that appear to be important aspects of food culture in African-American communities.

African-American identity and disordered eating. Although the research above indicates that Black identity may promote some unhealthy eating habits, other research suggests that it may have a protective effect against disordered eating of the restrictive and purging types: Pumariega, Gustavson, Gustavson, Motes, and Ayers (1994) found that a strong Black identity was negatively correlated with a "preoccupation with a desire to be thinner" (p. 13). Rogers-Wood and Petrie (2010) found a direct relationship between internalization of societal beauty ideals and disordered eating and proposed that, for ethnic minority women, a strong ethnic group identity may decrease the risk for body dissatisfaction and disordered eating due to a reduction in the internalization of general societal beauty ideals. In Abrams, Allen and Gray's (1993) study, college-age African-American women exhibiting disordered eating behaviors, specifically, restraint, body dissatisfaction, and drive for thinness, were more highly acculturated. Similarly, in a study of eating attitudes and dieting behaviors, Villarosa (1994) found that the stronger the Black identity, the less likely African-American women were to develop eating disorders. Rogers-Wood and Petrie (2010) argue that the accumulation of evidence that ethnic identity plays a role in disordered eating among ethnic minority women points to the need for measures of ethnic identity in studies related to the development of disordered eating. It

is noteworthy that the above research has focused on ethnic identity's relationship to disordered eating whereas there has been much less quantitative research on ethnic identity among overweight and obese women. Therefore, this study will add to the literature by exploring the relationships among racial identity, eating behavior, and exercise for African-American women.

Cultural impact on body image. This detrimental/protective paradoxical effect of African-American identity is partially a result of differing attitudes in the African-American community towards obesity and ideal body image. Degree of acculturation has been associated with a variety of health-related behaviors in African-Americans. Kumanyika (1993) noted that a belief in the 'melting pot' of the U.S. has obscured recognition of fundamental differences in norms, values, and world views of different ethnic groups. As noted previously, African-American women do not necessarily prefer to be obese and report a desire to be thinner (Cox, Zunker, Wingo, Thomas, & Ard, 2010). However, although a significant proportion of African-American women express concerns about their weight, there are a number of sociocultural differences between African-American women and White women that promote a larger body shape. Firstly, Kumanyika (1995) reported that African-Americans are much less likely to associate obesity with poor health. Gary et al. (2004) found that 81% of the participants in a diabetes intervention group self-rated their health as excellent, very good, or good, despite the fact that two-thirds of the 2,172 participants were overweight or obese, 21% had a doctor recommend that they lose weight, and 11% indicated that they had diabetes. Cox et al. (2011) found that for African-American women, quality of life (QOL) is instead influenced by how far one is from her desired body size. Body discrepancy (i.e., the difference between actual and ideal body size) completely mediated the relationship between BMI and QOL's self-esteem, and partially mediated the relationships

between BMI and physical function, public distress (e.g., concern about public ridicule, worry about fitting into seats or through turnstiles), and its effect on work. However, whereas both African-American and White women desire to be thinner, African-American women's QOL is not as dramatically impaired by excess weight (Cox et al., 2011).

Secondly, a unique component of the African-American community's weight-related issues is its general acceptance and embracing of larger body sizes (Gary, Gross, Browne, & LaVeist, 2006; Yates, Edman, & Aruguete, 2004; Shankar et al., 2004). This cultural factor, a preference for larger body sizes, complicates and potentially obscures the assessment of the true impact of BMI on quality of life (Cox et al., 2010). Furthermore, African-American women do not perceive themselves as unattractive if they are overweight (Hesse-Biber, Howling, Leavy, & Lovejoy, 2004). African-American women endorse a desire to be muscular and shapely, which they view as distinct from White women's desire to be excessively skinny (Akan & Grilo, 1995; James, 2004). In Bagley et al.'s (2003) study, for an average height woman of 5'4", African-American women set an ideal weight of 139 pounds, and White women set a weight of 128 pounds. In addition, the average African-American woman weighed 20 pounds more and identified higher highest weights and higher longest-maintained weights than the average White woman. In Blixen et al.'s (2006b) study, African-American women attributed significantly larger pound criteria for the categories of "overweight" or "obese" than White women.

African-American women also appear to have a positive body image bias: overweight African-American women are less likely than BMI-matched White women to perceive themselves as overweight (Williamson et al., 2000). A self-perception of a smaller body size may have a positive impact on quality of life and self-esteem but could, in turn, reduce motivation to

achieve a healthier body weight (Cox et al., 2010). Paeratakul, White, Williamson, Ryan and Bray (2002) found that more than one half of the overweight and approximately 20% of the obese African-Americans believed they were of normal weight. In contrast, White women who considered themselves to have no weight problem were near or below the lower limit of the recommended weight range. Bennett and Wolin (2006) found that overweight African-American women were twice as likely as overweight White or Hispanic women to misperceive their weight, and obese African-American women were three times more likely to misperceive their weight than White women.

In addition, African-American women experience a disparity between current and ideal weights at a higher BMI than White women (Fitzgibbon, Blackman, & Avellone, 2000). In Bish et al.'s (2005) study, 29.5% of White participants with a BMI less than 25 were trying to lose weight compared to 20% of African-American participants. In the 25 to 29.9 BMI category, 60.9% of White participants versus 47.9% of African-American participants were trying to lose weight. The difference did not disappear until the highest weight category (BMI ≥ 30), with 69.4% of White participants and 68.4% of African-American participants attempting to lose weight. However, Williamson et al. (2000) reported that at virtually all body sizes above a BMI of 18, African-American women perceive less discrepancy between current and ideal body sizes and thus experience less body dissatisfaction.

The stigma associated with obesity is well-established (Puhl & Brownell, 2003; Puhl & Heuer, 2010; see also Bell & Morgan, 2000). However, from a developmental perspective, it appears that African-American and White women receive different messages about weight and eating during childhood and adolescence, with White women reporting significantly

greater negative social pressure regarding their weight (Striegel-Moore et al., 1996). Blixen et al. (2006a) and Blixen et al. (2006b) found that White women endorsed a greater sense of stigma associated with being overweight than did African-American women. In Altabe's (1998) study, African-American women had significantly higher scores than Hispanics, Asian-Americans, and Whites on a measure of automatic positive body image thoughts, supporting the perspective that there is less stigma attached to weight. Moreover, Vaughn et al. (2008) found that race/ethnicity predicted perceived romantic appeal of thinness. African-American males prefer larger bodied women than White males (Blixen et al., 2006a; Blixen et al., 2006b; Hesse-Biber et al., 2004; Powell & Kahn, 1995; Thompson, Sargent, & Kemper, 1996).

Overall, African-American women report less pressure to be thin, less dieting, less dissatisfaction with their weight, and greater acceptance of being overweight than White women (Fitzgibbon et al., 2000; Grabe and Hyde, 2006; Paeratakul et al., 2002; White and Grilo, 2005). In summary, Cox et al. (2010) propose a "2-layered disconnect" that contributes to the intensified obesity problem among African-American women: 1) African-American women perceive themselves as overweight at a significantly higher BMI, and 2) African-American women that might wish to obtain lower weight are not particularly motivated to reach a normal BMI due to a greater cultural acceptance of being overweight.

The Role of Locus of Control in Weight-Related Health Behaviors

Whereas there is a significant literature on the sociocultural factors reviewed above, a much smaller amount of research has examined the important role of psychological factors. Turning to another focus of the proposed study, one psychological factor that may be particularly significant in weight-related health behaviors is locus of control. Several studies have

suggested that African-Americans and Whites may differ in their loci of control when considering health-related outcomes. Aladesanmi and Blixen (2004) report that American ethnic minorities are less likely than White Americans to identify with values associated with the U.S. medical system, such as the dichotomization of body and mind, the belief that individuals have control over their environment, and the value of assuming responsibility for one's health. For example, Malcarne, Drahota, and Hamilton (2010) found that African-American children scored higher than White children on measures of powerful others (e.g., health care providers) and chance (e.g., that luck plays a role in one's health). Additionally, in a sample of college students, Landrine and Klonoff (1994) found that African-Americans attributed illnesses to higher powers to a greater extent than Whites.

Barroso et al. (2000) investigated health beliefs and locus of control related to breast cancer and found that African-American women were significantly more likely than White women to believe in chance and to depend on powerful others for their health. Among African-American women, doubts about the value of early diagnosis (i.e., African-American women with higher scores on Powerful Others viewed early diagnosis as less beneficial), perceived susceptibility to cancer (i.e, African-American women who agreed that all women could be cured had higher scores on Powerful Others) and beliefs about the seriousness of breast cancer (i.e., higher scores on Chance among African-American women who believed breast cancer was fatal) were all significantly associated with powerful other scores. Swinney (2002) found that African-American women with breast cancer tended to view God as the powerful other capable of influencing their health and well-being. This is particularly relevant as researchers (Grotz, Hapke, Lampert, & Baumeister, 2011) have found that participants scoring higher on the chance

dimension of the Multidimensional Health Locus of Control (MHLC) had less dental protection, participated in less sports activity, took fewer health courses, and engaged in less systematic information-seeking and concluded that high chance health locus of control is a risk factor for inadequate health behaviors.

In particular, fatalism, which reflects an external locus of control, may influence health behaviors in African-Americans. Egede and Bonadonna (2003) found that fatalism was negatively associated with self-management among African-Americans with type 2 diabetes and that participants with higher fatalism scores indicated that diabetes is uncontrollable, an inevitable generational fate, and a death sentence. In Chlebowy et al.'s (2010) study, a perceived lack of control over diabetes was cited as a barrier to treatment adherence for African-American participants. Philip, DuHamel, and Jandorf (2010) found that a decrease in fatalism post intervention differentiated African-American patients who underwent colorectal cancer screening from those who did not. Zollinger et al. (2010) found that African-American women with higher education were more knowledgeable and had lower fatalism scores than African-Americans with lower levels of education. Similarly, Powe's (2001) study found that among African-American women, less education, higher age, and less knowledge predicted high levels of fatalism related to cancer. These studies suggest that interventions should be tailored to education level and that locus of control may underlie some of the motivational barriers to weight loss noted above.

The inclusion of health locus of control as a variable in intervention design may result in better health outcomes. Bundek, Marks, and Richardson (1993) found that individuals with an internal locus of control were more likely to engage in screening behaviors over which one has a high degree of personal control, e.g., attending to health-related information, picking

up pamphlets, whereas those with an external locus of control were more likely to engage in physician-dependent screening activities, e.g, recency of pap smear and physician breast exams. In a study of adults with at least one chronic illness, Rybarczyk, DeMarco, DeLaCruz, and Lapidos (1999) found that a decrease in health locus of control "chance" beliefs varied as a function of type of intervention. In a study promoting mammography utilization, Williams-Piehota, Schneider, Pizarro, Mowad, Salovey (2004) found that women who received messages tailored to their health locus of control orientation were more likely to obtain mammograms in the six and twelve months following the intervention than women who received messages inconsistent with their orientation. Quadrel and Lau (1989) also found that health locus of control matched messages related to breast self-examination were more effective in motivating behavior. In a study by Wallston, Wallston, Kaplan, and Maides (1976), subjects matched on health locus of control orientation were assigned to an internally or externally directed weight loss intervention. Subjects in programs consistent with their health locus of control orientation reported more satisfaction and demonstrated more weight loss than those in programs inconsistent with their health beliefs. Finally, Martins and Carvalho (2013) found that among oncology patients, preferences for the delivery of bad news by health care professionals varied as a function of health locus of control orientation.

CHAPTER II

RATIONALE FOR THE CURRENT STUDY

Whereas examinations of health locus of control and ethnic identity have proved fruitful in other health areas, their role in obesity has been under-researched. Health locus of control could be targeted in prevention and intervention work—at the community and/or individual level. The study population, African-American women college students, was chosen for several reasons: Firstly, African-American women are at considerable greater risk for being overweight or obese. Secondly, young people are believed to be more knowledgeable about nutrition and health than older adults, and African-American women in particular are considered to be good targets for health-related interventions (James, 2004; Kieffer et al., 2004). Finally, there is some evidence that health locus of control orientation plays a greater role in the health behaviors of younger individuals than older individuals (James, 2004; Powe, 2001; Schneider et al., 2006), and it was deemed worthy of further investigation.

Primary Aim

The primary aim of the current investigation was to examine how well several specific psychosocial factors, Black identity, locus of control, and exercise motivation, predict eating habits and BMI in a sample of African-American college women.

Hypotheses

Controlling for age and SES, self-report measures of several key psychological constructs would predict weight and eating behaviors in a sample of African-American college women. More specifically, given the previously reviewed

association between external locus of control and less adaptive health related behavior in other diseases (e.g. breast cancer), as well as evidence of a link between cultural/ethnic identification in African-American women and poorer eating habits, it was predicted that:

1. A greater external health locus of control and a stronger Black identity mediated by Uncontrolled Eating would predict a higher BMI. That is, a mediation model was proposed, whereby Uncontrolled Eating would clarify or identify the mechanism by which the specified independent variables affect BMI.
2. A greater external health locus of control, a stronger Black identity and less exercise motivation mediated by exercise activity would predict a higher BMI.

CHAPTER III

METHODS

Participant Characteristics

The study was specifically looking at eating and exercising attitudes among African-American college women, and 449 participants were recruited from an HBCU located in southeastern Virginia. Data from participants who identified as other than African-American (N = 38) were removed from the original sample. In addition, four "trap" questions were embedded in the survey in order to detect random responders, e.g., "Please answer neutral" with answer choices of "Strongly Disagree", "Neutral" and "Strongly Agree" (Smith, 2013). One of these questions was determined to be too ambiguous and thus was not used. The data of those who failed any of the three remaining trap questions (N = 57) were removed. The final sample consisted of 354 participants. Initial analyses were conducted to examine participant characteristics with respect to demographics, BMI, and other relevant factors. In terms of demographic variables, the mean age for the sample was 21.9 years of age (SD=2.87). The majority of the sample had a relationship status of Single, Never married (N= 262; 74.0%) and did not have children (N=303; 85.6%). One hundred and sixty six of the participants (46.9%) lived on campus and 188 (53.1%) lived off campus (see Table 1 for Ms and SDs).

Table 1

Sample Descriptive Statistics: Demographics All Participants (N=354)

Characteristic	*N* (%)
Father education level	
Less than high school	32 (9.0)
High school degree or equivalent	134 (37.9)
Some college	107 (30.2)
Associates	24 (6.8)
Bachelors	35 (9.9)
Graduate degree	22 (6.2)
Mother education level	
Less than high school	14 (4.0)
High school degree or equivalent	84 (23.7)
Some college	80 (22.6)
Associates	57 (16.1)
Bachelors	75 (21.2)
Graduate degree	44 (12.4)
Education level	
Undergraduate	318 (89.8)
Graduate	36 (10.2)
Grade	
Freshman	31 (8.8)
Sophomore	78 (22)
Junior	106 (29.9)
Senior	101 (28.5)
N/A	37 (10.5

Table 1 Continued

Characteristic	*N* (%)
Residence status	
On campus	166 (46.9)
Off campus	188 (53.1)
Relationship status	
Married	18 (5.1)
Divorced	1 (.3)
Separated	4 (1.1)
Domestic partnership/civil union	12 (3.4)
Single but cohabitating	57 (16.1)
Single never married	262 (74)
Children	
Yes	51 (14.4)
No	303 (85.6)
Weight loss strategy use	
Exercising	179 (50.6)
Eating less	134 (37.9)
Healthier diet	170 (48)
Appetite suppressants	24 (6.8)
Herbal remedies	14 (4)
Laxatives	2 (.6)
Purging	1 (.3)
N/A	101 (28.50)

Procedures

All procedures were approved by the Institutional Review Board.

Recruitment. The questionnaires were administered through an online survey. All African-American women attending the university were sent a link to the survey, inviting them to participate. Individuals who completed the survey were entered into a random drawing, and two were selected using a random number generator (random.org) to receive gift cards worth $50 at the university bookstore.

Administration of the measures and assessments. The study commenced with an information statement describing the study and yes/no click boxes where participants indicated their informed consent (see Appendix A). All questionnaires were administered online via Survey Monkey. The information was anonymous, and students who elected to enter the raffle were directed to a link that was not associated with their survey data to provide contact information.

Measures

Demographic Questionnaire (Appendix B)**.** Participants were asked to provide demographic information in order to identify gender, ethnicity, age, grade classification, income bracket, residency, whether or not they had children, weight and height (to calculate BMI), and ideal weight. McAdams, Van Dam, and Hu (2007) found BMI calculated from self-reported weight and height BMI to be highly correlated with technician-measured BMI (.93 for African-Americans) and thus was sufficient for the purposes of this study. Ideal weight was used in conjunction with actual weight to establish a measure of body discrepancy (Castonguay, Brunet, Ferguson, & Sabiston, 2012).

Depression. Depression and suicide ideation has been found to be associated with a higher BMI in both White and African-American women (Carpenter, Hasin, Allison, & Faith, 2000). The Patient Health Questionnaire, Depression Module (PHQ-9) (see Appendix C) consists of 9 questions assessing the 9 criteria upon which the diagnoses of DSM-IV depressive disorders are based. Participants are asked how often they have been bothered by a series of problems over the course of the past two weeks. Each item on the PHQ-9 is scored on a Likert Scale of 0 to 3 in which 0 corresponds to "Not at All" and 3 corresponds to "Nearly Every Day." The items are then summed for a composite score: A score of 1-4 is interpreted as minimal depression; a score of 5-9 is interpreted as mild depression; a score of 10-14 is interpreted as moderate depression; a score of 15-19 is interpreted as moderately severe depression; and a score of 20-27 is interpreted as severe depression.

In a study of 6,000 patients in 8 primary clinics and 7 obstetrics-gynecology clinics, construct validity was assessed using the Short-Form General Health Survey, self-reported clinic visits and sick days, and symptom-related difficulty. An independent structured mental health professional interview was used to assess the criterion validity of the PHQ-9 in a sample of 580 patients. It was determined to be a reliable and valid measure of depression severity (Kroenke, Spitzer, & Williams, 2001). The internal consistency of the PHQ-9 in the current study was .85.

Racial identity. Racial identity involves the degree to which individuals gravitate to and identify with their racial/ethnic group. Ethnic identity encompasses elements such as racial/ethnic pride, affinity for in-group culture (e.g., food, language), attitudes toward majority culture, association with in-group members, and the importance placed on conserving one's culture (Resnicow, et al., 2009). The Multidimensional Inventory of Black Identity, (MIBI) (see Appendix D) is 56

questions that comprise 7 subscales representing 3 stable dimensions of African-American identity: centrality, ideology, and regard. The Centrality scale consists of 8 items that assess the extent to which being African-American is central to one's definition of oneself (e.g, "In general, being Black is an important part of my self-image"). The Ideology scale assesses how African-Americans view socio-cultural issues, intergroup relations, economic-political issues, and attitudes toward the majority group. The Ideology scale consists of 36 items measuring four philosophies, each with 9 items: Assimilation, Humanist, Minority, and Nationalist. The Regard scale consists of two subscales, Private Regard and Public Regard, each with 6 questions.

The Centrality subscale (e.g, "In general, being Black is an important part of my self-image") and Assimilation subscale ((e.g., "Blacks should view themselves as being American first and foremost"), was utilized in the current study. Each item is scored on a Likert Scale in which "strongly disagree" corresponds to 1 point and "strongly agree" corresponds to 7 points. Items are averaged across each subscale with several questions reverse scored. A composite score is not appropriate for the MIBI, because it is a multidimensional conceptualization of racial identity. In an examination of the MIBI's reliability and construct validity, the Kaiser-Meyer-Olkin (KMO) test was used to evaluate the results of factor analysis and revealed that the MIBI represents three inter-related factors as opposed to one single construct (Sellers, Rawley, Chavous, Shelton & Smith, 1997). Sellers et al. (1997) found that the Cronbach's alphas for Assimilation was .73 and .77 for Centrality. The internal consistency in the current study was .67 for both the subscale Assimilation and the subscale of Centrality. Sellers et al. (1997) also found evidence of external validity: the MIBI scales were correlated with race-related activities (e.g., likelihood of

interacting with other African-Americans and of taking Black Studies courses) in the predicted directions. The current study's hypotheses specifically involved the Centrality (items 1(R), 6, 9, 13 (R), 19, 33, 48, and 51(R); possible range of 8-56) and Assimilation (items 10, 18, 37, 39, 40, 41, 43, 44, and 46; possible range of 9 to 63) scales in Appendix D. The interscale correlation between Centrality and Assimilation has been found to be in the predicted direction, with the correlation between individuals high on Centrality being less likely to endorse Assimilationist attitudes (Sellers et al., 1997). Likewise, in the current study, the Centrality and Assimilation scales were significantly negatively correlated as one would expect, r (354) = -.147, $p < .05$.

Health locus of control. The Multidimensional Health Locus of Control (MHLC) is one of the most frequently used measures of health related beliefs. The MHLC was developed in response to Rotter's (1975) assertion that situation-specific locus of control measures could be more informative than general locus of control measures. In support of this, Wallston et al. (1976) and Wallston and Wallston (1978) found that an area-specific measure of generalized expectancy had greater functional utility than Rotter's (1966) nonspecific locus of control I-E scale. Further, the correlation between the original MHLC and the Rotter I-E was .33 ($p <.01$), supporting the concurrent validity of the MHLC as well as establishing discriminant validity (Wallston & Wallston, 1981). The MHLC was created to be a generalized expectancy measure that cuts across many healthcare settings and behaviors such that highly specific health locus of control measures for each health condition (e.g., hypertension, cancer) and health behavior (e.g., smoking, information seeking, medication compliance) would be unnecessary (Wallston & Wallston, 1981). There are three versions of the MHLC: Forms A and B are "general" health locus of control

forms whereas Form C is "condition-specific." Form A was used for the current study and is an 18 item scale (see Appendix E) comprising three subscales: Internality ("If I get sick, it is my own behavior which determines how soon I get well again"); Powerful Others Externality ("My family has a lot to do with my becoming sick or staying healthy"); and Chance Externality ("No matter what I do, if I'm going to get sick, I'm going to get sick") (Wallston, Stein, & Smith, 1994). Internality is the only subscale that reflects an internal locus of control; the other two subscales represent an external locus of control. There is no total score for the MHLC. Scores are compiled for each subscale by summing the items comprising the subscale. Each item is scored on a Likert Scale in which "strongly disagree" corresponds to 1 point and "strongly agree" corresponds to 6 points. Form A measures one's general health locus of control beliefs and is typically the form used with healthy samples (Wallston, 1993). The alpha reliabilities of the three scales have found to be moderately reliable (i.e., they have Cronbach alphas in the .60 - .75 range and test-retest stability coefficients ranging from .60 - .70) and adequate for research purposes (Wallston & Wallston, 1981; Wallston et al., 1994). The external locus of control subscales of Chance (items 2, 4, 9, 11, 15, and 16; possible range of 6-36) and Powerful Others (3, 5, 7, 10, 14, and 18; possible range of 6 to 36) were utilized in the current study, and the internal consistency (the combined subscales of Chance Externality and Powerful Others Externality) in the current study was .72.

Exercise motivation. The Behavioural Regulation in Exercise Questionnaire (BREQ-2) (see Appendix F) measures exercise motivation and is intended to capture the essence of the stages of change. The BREQ-2 consists of 19 items comprising five subscales that range on a continuum from completely non-self-determined to completely self-determined:

Amotivation, External Regulation, Introjected Regulation, Identified Regulation, and Intrinsic Regulation. Amotivation is defined as lacking any intention to engage in a behavior and is a non-self-determined form of regulation (e.g., "I think exercising is waste of time"). External Regulation is defined as engaging in an activity due to external contingencies (e.g., "I take part in exercise because my family/friends/partner say I should''). Introjected Regulation is also a type of external motivation, but the contingencies have been internalized to some extent, such that the individual acts to increase self-esteem or diminish guilt (e.g., "I feel guilty when I don't exercise"). Identified Regulation refers to engaging in an activity because one consciously recognizes the positive outcome associated with the behavior. At this level of motivation, individuals are doing something because they want to, not because they should (e.g., "It's important to me to exercise regularly"). Intrinsic Regulation is defined as engaging in an activity for enjoyment or as an end in itself; the activity is fully congruent with the individual's values (e.g., "I exercise because it's fun). Intrinsic motivation, as opposed to external motivation, is typically associated with more sustained engagement in an activity or behavior (Ingledew & Markland, 2008). Each subscale consists of 4 items with the exception of Introjected Regulation which has 3.

BREQ-2 items are scored on a Likert Scale with 0 representing "Not true for me", 1-3 representing "Sometimes true for me", and 4 representing "Very true for me." The BREQ-2 can be scored as multidimensional scores by calculating the mean score for each subscale, or a single score can be derived from the subscales: the Relative Autonomy Index (RAI). The RAI, which was developed and validated by Connell and Ryan (1985) and was used for the current study, provides an index score of the extent to which the individual feels self-determined. The RAI is calculated by applying a weighting to each

subscale (Amotivation = -3; External Regulation = -2; Introjected Regulation = -1; Identified Regulation = +2; Intrinsic Regulation = +3) and then summing these weighted scores. The purpose of including the BREQ-2 was twofold: to gain a fuller understanding of the role stage of change plays in exercise participation and to examine the BREQ-2's relationship to BMI among African-American women. Although no specific reliability and validity information could be found regarding the RAI itself, the factorial validity of the BREQ-2 is supported by the work of Mullan, Markland, and Ingledew (1997) and Wilson, Rodgers, and Frasier (2002). Rose, Markland, and Parfitt's (2001) workplace study found correlations in the expected direction between the BREQ and the Exercise Causality Orientations Scale, supporting the convergent and discriminant validity of the BREQ-2. Wilson, Rodgers, Blanchard, and Gesell's (2003) research involving a 12-week exercise program also supported the convergent, discriminant, and predictive validity of the BREQ-2. In the current study, the internal consistency coefficients for the subscales were as follows: .88 for Amotivation; .82 for External Regulation; .68 for Introjected Regulation; .72 for Identified Regulation; and .92 for Intrinsic Regulation.

Exercise activity. The Godin Leisure-Time Exercise Questionnaire (GLTEQ) (see Appendix G) is a self-report measure of physical activity. It asks how many times, on average, a person does more than 15 minutes of mild, moderate, and strenuous exercise over the course of a week. It also asks how often a person works up a sweat over the course of a week. Its creators' objective was to develop a physical activity questionnaire that is reliable, valid, easy to complete, and that does not require detailed checking by professional staff. The purpose of the GLTEQ is to group people into activity categories in order to examine the association of this aspect of behavior with psychosocial variables (Godin & Shepherd, 1985). The concurrent

validity of the GLTEQ was established in a study of 306 adults, and body fat (BF) and maximum oxygen intake ($VO_{2)}$ were used as criteria of validity for the questionnaire. The highest individual correlations between subjective and objective data were between BF percentile and a self-rating of sweat-inducing exercise (r =.21; p<.001) and VO_2 and self-rating of strenuous exercise (r = .38; p < .001). Discriminant validity was also established: Individuals were assigned to FIT and UNFIT categories (based on $VO_{2)}$ and THIN and FAT categories (BF). The GLTEQ was able to discriminate the majority of THIN from FAT and FIT from UNFIT participants (Godin & Shepherd, 1985). In a simultaneous evaluation of 10 frequently used physical activity questionnaires, Jacobs, Ainsworth, Hartman, & Leon (1993) found the GLTEQ to have average validity. The total test-retest reliability of the GLTEQ is .74 and particularly high for the "Sweat" (.80) and "Strenuous" categories (.94) but relatively low for the categories of "Light" (.48) and "Moderate" (.46). This is a common issue (i.e., greater reliability for the more intense categories of physical activity) among self-administered physical activity questionnaires (Jacobs et al, 1993; Shepherd, 2003).

The GLTEQ is scored by multiplying the weekly frequencies of strenuous, moderate, and light exercise by 9, 5, and 3 METS, respectively. A MET is an estimated metabolic equivalent of energy expenditure. The scores are then tallied for a total leisure activity score. The second question is used to calculate the frequency with which a person works up a sweat over the course of a week.

Eating habits. The Three Factor Eating Questionnaire (TFEQ-R18) (see Appendix H) consists of 18 items that measure 3 aspects of eating behavior: cognitive restraint (CR), uncontrolled eating (UE), and emotional eating (EE). Cognitive

Restraint (6 items) refers to a conscious restriction of food intake for the purposes of weight loss or body weight maintenance (e.g., “I deliberately take small helpings as a means of controlling my weight”); Uncontrolled Eating (9 items) refers to a tendency to eat more than usual because of a loss of control over intake combined with subjective feelings of hunger (e.g., “I am always hungry so it is hard for me to stop eating before I finish the food on my plate”); and Emotional Eating (3 items) refers to an inability to resist emotional cues (e.g., “ When I feel anxious, I find myself eating”).

Each item is scored on a 4- point Likert scale (1-4), and higher scores reflect higher levels of restrained eating, disinhibited eating, and emotional eating. The TFEQ-R18 has been found to be reliable and applicable for distinguishing among eating patterns in both obese and general populations (de Lauzon et al., 2004). The three factors have been shown to distinguish between the reported and desired use-frequency and liking for certain fat and sugar-containing foods. Karlsson, Persson, Sjöström, and Sullivan (2000) evaluated the construct validity and scaling values of the TFEQ-18. Reliability for the Uncontrolled Eating subscale has been reported at .83 (de Lauzon et al., 2004), but its internal consistency in the current study was .62. BMI has been found to be significantly associated with Uncontrolled Eating in African-American participants (Porter & Johnson, 2011). The Uncontrolled Eating scale (items 1, 4, 5, 7, 8, 9, 13, 14, and 17; possible range 9 to 36) in Appendix H was used for the purposes of the current study.

CHAPTER IV

ANALYTIC PLAN

Based on a power analysis conducted in G Power 3 (Erdfelder, Faul, & Buchner, 1996) with four predictor variables, 89 participants were required for this study. This sample size should yield a power of about .80 in testing hypotheses in the regression analyses, with an anticipated medium effect size (R^2= .15) and a nominal alpha level of .05. Preliminary analyses were planned to ensure that characteristics of the data did not violate statistical test assumptions. Zero- order correlations and two multiple regression analyses were planned for the entire sample to evaluate the proposed associations. The PHQ-9 score and the demographic variables of age and SES were to be entered as covariates in the first step of the multiple regression analyses because of the established association between depression and BMI (Carpenter et al., 2000), and the possibility that age and SES would be associated with health locus of control, eating attitudes, and BMI: As noted above, health locus of control may play a bigger part in the health behaviors of younger individuals (James, 2004; Powe, 2001; Schneider et al., 2006). In addition, the frequency of overweight increases with age to reach a peak at age 55-64 in women (Bray & Bellanger, 2006). Lower SES has been found to be correlated with higher BMI (Sobal & Stunkard, 1989; Wardle et al., 2004).

Preacher and Hayes' (2004) nonparametric bootstrapping procedure was planned to simultaneously assess for the effects of the independent variables: health locus of control (MHLC, external locus of control subscales) and Black identity (MIBI, Assimilation and Centrality subscales, as well as for an indirect effect of Uncontrolled Eating in the direction predicted by the mediation model in the hypothesis (see Figure 1).

Figure 1.

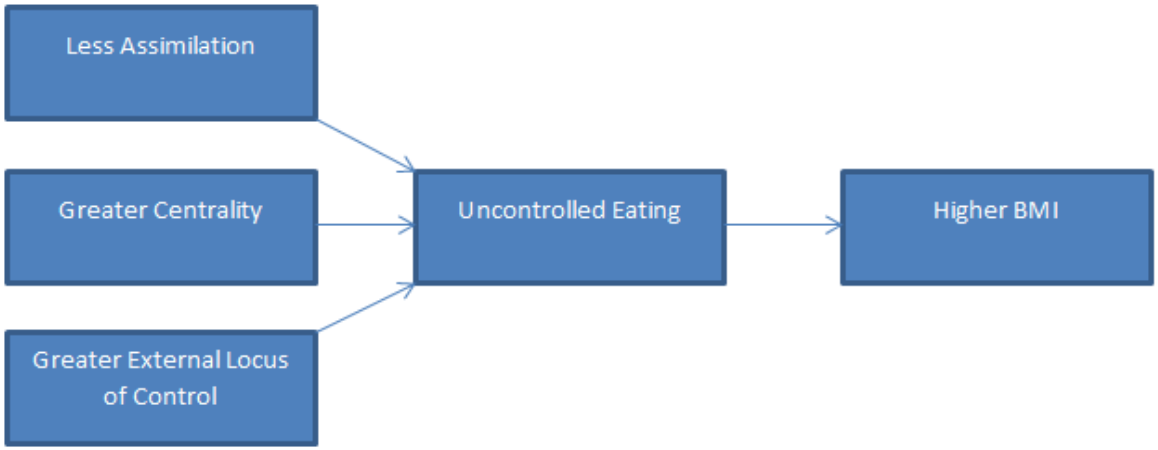

Figure 1. Mediation model of hypothesis 1. Assimilation, Centrality, and external locus of control are the predictors. Uncontrolled Eating is the mediator. BMI is the dependent variable.

In the second regression, the dependent variable will be BMI, and the independent variables were health locus of control (MHLC, external locus of control subscales), Black Identity (MIBI, Assimilation and Centrality subscales), and exercise motivation (BREQ-2, RAI), with the bootstrapping method simultaneously assessing for a mediating, or indirect, effect of exercise activity (GLTEQ).

Figure 2.

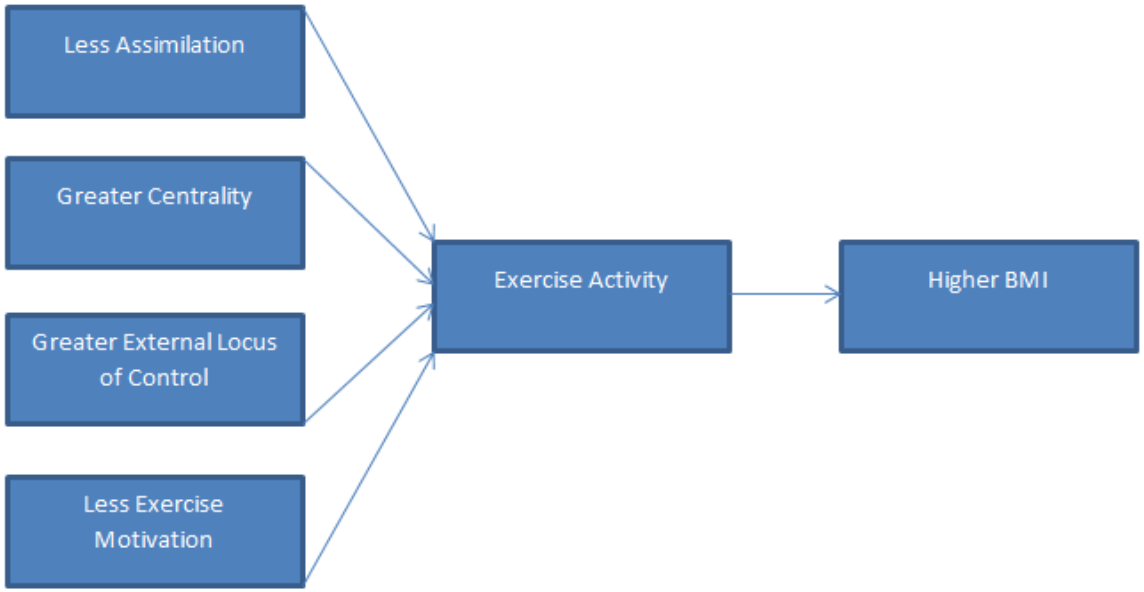

Figure 2. Mediation model of hypothesis 2. Assimilation, Centrality, external locus of control, and Exercise motivation (as measured by the Relative Autonomy Index) are the predictors. Exercise activity is the mediator. BMI is the dependent variable.

CHAPTER V

RESULTS

Data Cleaning

Prior to conducting analyses, all data were screened for accuracy in order to ensure that all values were within range and all standard deviations were plausible. Three GTLEQ scores were 3.5 standard deviations from the next highest score and deemed to be the results of user error. These three scores (255) were transformed to the next highest score (150) (Tabachnick & Fidell, 2013). All other data were within normal range for the respective variables.

Preliminary analyses were performed to ensure no violation of the assumptions of normality, linearity, and homoscedasticity. The data was assessed for normality via the Shapiro-Wilk test in SPSS (Ghasemi & Zahediasl, 2012), and the BMI distribution was found to be non-normal. BMI was skewed ($z = 7.38$) and slightly kurtotic ($z = 2.03$), but an examination of its scatterplot indicated the assumptions of linearity and homoscedasticity were met. Tabachnick and Fidell (2013) contend that variables should be transformed to bring them closer to normal unless there is a compelling reason not to transform. Thus, various transformations (log, inverse, and square root) were conducted in order to find the best fit (inverse transformation) for BMI. All subsequent analyses were then conducted with the transformed, inverse BMI scores.

Descriptive Statistics for Study Variables

BMI data. The mean BMI for the sample was 28.54 kg/m^2 (*SD*=7.54). See Table 2 for an analysis of BMI categories. The average weight discrepancy (i.e., difference between current

and ideal weight) was 22.9 pounds, although the mode (37 participants) was 0, indicating that the most frequent response was contentment with one's current weight. Twenty pounds was the next most frequently endorsed weight discrepancy with 21 participants.

Table 2

BMI Categories for the Sample (N = 354)

BMI Category	*N* (%)	*M* (*SD*)
Underweight (<18.5)	7 (1.98)	17.67 (.70)
Normal (18.5≤BMI≤24.9)	136 (38.53)	22.11 (1.70)
Overweight (25≤ BMI≤29.9)	90 (25.50)	27.46 (1.38)
Obese (30≤BMI≤40)	89 (25.21)	34.59 (2.89)
Very Obese (BMI>40)	31 (8.78)	44.81 (3.36)

Predictors. The *M*s and *SD*s for the predictor variables of Assimilation, Centrality, external locus of control, and RAI, as well as for the covariates of depression and Age, are presented in Table 3. The *N*s differed among scales due to participant drop-out.

Table 3

Ms and SDs for the Predictor Variables

Variable	*M* (*SD*)	*N*
Assimilation	47.26 (8.01)	234
Centrality	37.92 (8.57)	226
External Locus of Control	36.14 (9.36)	218
RAI	32.52 (28.02)	213
Age	21.89 (2.87)	354
PHQ-9	6.16 (5.23)	341
GTLEQ	46.90 (30.31)	210
Uncontrolled Eating	24.58 (4.56)	191

The psychological symptomatology of depression was assessed via the PHQ9 in order to determine its relationship to BMI in the current study. See Table 4 for the distribution of PHQ9 depression scores in the sample.

Table 4

Frequency of PHQ-9 Scores (N=341)

PHQ9 Depression Score	*N* (%)
None (0-4)	161 (47.2)
Mild (5-9)	104 (30.5)
Moderate (10-14)	51 (15.0)
Moderately Severe (15-19)	15 (4.4)
Severe (20-27)	10 (2.9)

Missing Data

Because there was a significant amount of missing data, all variables were examined for patterns of Missing Completely at Random (MCAR), Missing at Random (MAR), and Missing Not at Random (MNAR). A Missing Values Analysis was conducted in SPSS and separate variance *t*-tests were run to determine whether missing values on any variable was related to any other variables. The separate variance *t*-tests revealed that there were no systematic relationships between missingness on any of the variables with the exception of age. Those who did not complete the following scales were significantly younger: RAI, $t(313.5)$, $p < .05$; GTLEQ, $t(314.9)$, $p < .05$; Centrality, $t(280.7)$, $p < .05$; and external locus of control, $t(298.3)$, $p < .05$. Little's MCAR test was non-significant, $p = .244$, so MCAR can be inferred. Because the proportion of missing values was substantial for all variables with the exception of age, BMI, and PHQ-9, Multiple Imputation (MI),

currently considered the most respectable method for handling missing data according to Tabachnick and Fidell (2013), was chosen as the most reasonable approach for the imputation of missing data. Fully Conditional Specification (suitable for MCAR data) was the designated imput method, and five imputations were performed. All analyses were then conducted with the pooled data from MI (Tabachnick & Fidell, 2013).

Correlation and Regression Analyses

Pearson correlations. The first hypothesis predicted significant relationships between the psychological variables of external locus of control (assessed by the MHLC, Form A) and Black identity (assessed by the Assimilation and Centrality variables of the MIBI) and BMI, mediated by Uncontrolled Eating. The second hypothesis also included external locus of control, Black identity, and added exercise motivation (measured by RAI) as a predictor and exercise activity (GTLEQ) as a mediator. Therefore, prior to conducting the regression and bootstrap analyses, bivariate Pearson correlations were conducted as a preliminary investigation of the relationships among BMI, and the psychological variables of interest, including external locus of control, RAI, Centrality, Assimilation, the mediators, Uncontrolled Eating and exercise activity, and the two covariates, age and the PHQ-9 (see Table 5 for correlation coefficients). The demographic variable of interest, age, was significantly correlated with BMI, r (354) = .146, $p < .01$, but the demographic variables of maternal education level and paternal education level (proxies for SES) were not associated with BMI. As predicted, the clinical variable of interest, PHQ-9, was significantly correlated with BMI, r (354) = .150, $p < .05$. Contrary to the hypotheses, external locus of control, Centrality, Assimilation, and RAI were not significantly correlated with BMI.

Table 5

Associations between Body Mass Index and Psychological Variables of Interest for All Subjects (N=354)

Variables	BMI	Assimilation	Centrality	External Locus	RAI	Age	PHQ-9	Mother Education	Father Education	GTLEQ	Uncontrolled Eating
BMI		.007	.093	.046	.018	.145**	.129*	-.005	-.058	-.059	.009
Assimilation			-.147*	.288**	.096	.014	.155*	.007	.078	.189*	-.050
Centrality				-.069	.074	.082	-.079	.092	.049	.105	.003
External Locus					-.180*	-.102	.253**	.012	-.043	.100	-.267**
RAI						.028	-.198**	-.048	-.102	.335**	.311**
Age							-.105	-.021	.035	-.144	.113
PHQ-9								-.021	-.094	-.069	-.179**
Mother Education									.299**	-.049	-.080
Father Education										.048	.048
GTLEQ											-.024
Uncontrolled Eating											

Note. RAI = Relative Autonomy Index; PHQ-9 = Patient Health Questionnaire; GTLEQ = Godin Leisure Time Exercise Questionnaire. BMI is transformed to the inverse of BMI. All data was calculated using MI pooled data. *= $p < .05$; ** = $p < .01$.

Regression analyses. For hypothesis 1, a regression analysis was then conducted with age and PHQ-9, the control variables, entered in Step 1, the predictors of external locus of control, Centrality, and Assimilation entered in Step 2, and BMI entered as the dependent variable. SES was not controlled for using the proxy measures of Father or Mother Education because neither of these measures had a significant relationship with any variables other than one another. The results of the regression analyses (see Table 6) revealed that the only significant relationships were those between BMI and age, $t(354) = 2.91$, $p < .01$, and BMI and PHQ-9, $t\ (354) = .266$, $p < .01$.

Table 6

Predictors of BMI (Assimilation, Centrality, and External Locus of Control)

Predictor	β	F	R	Adj. R^2	ΔR^2
Step 1		4.37*	.198	.030	.039
Age	-.123*				
PHQ-9	-.161*				
Step 2		2.12*	.219	.025	.009
Age	-.118*				
PHQ-9	-.163*				
Assimilation	.014				
Centrality	-.086				
External Locus	-.034				

Note. PHQ-9 = Patient Health Questionnaire. * = $p < .01$

A second regression was conducted for hypothesis 2; the only difference was the addition of RAI as a predictor variable. The relationships between Age and BMI remained significant, $t\ (354) = 2.93$, $p < .01$, as did the relationship between PHQ-9

and BMI, t (354) = 2.73, $p < .01$, but no other variables contributed significantly to the different levels of BMI. See Table 7.

Table 7

Predictors of BMI (Assimilation, Centrality, External Locus of Control, and RAI)

Predictor	β	F	R	Adj. R^2	ΔR^2
Step 1		3.91*	.190	.027	.036
Age	-.119*				
PHQ-9	-.154*				
Step 2		1.57*	.209	.016	.008
Age	-.115*				
PHQ-9	-.156*				
Assimilation	.017				
Centrality	-.078				
External Locus	-.039				
RAI	-.010				

Note. PHQ-9 = Patient Health Questionnaire. * = $p < .01$

The proposed mediation analyses of the hypotheses were not conducted because there were not significant relationships between BMI and the variables of RAI, external locus of control, Centrality, or Assimilation. Since the initial predictions were not significant, there was no justification to proceed with an exploration of how the predictors were related to the DV of BMI.

CHAPTER VI

DISCUSSION

The purpose of the current study was to examine the relationships among racial identity, locus of control, exercise motivation, and BMI in African-American college women. The current study made two predictions: First, an external locus of control and Black identity, mediated by Uncontrolled Eating, would predict BMI. Second, that an external locus of control, Black identity, and exercise motivation, mediated by exercise activity, would predict BMI. Due to their suspected influence on BMI, SES (assessed via parental education level), age, and the PHQ-9 depression measure were included in analyses as covariates. The results revealed significant relationships between BMI and depressive symptomology and BMI and age, but no other predicted relationships were significant.

Findings and Implications

Black identity and obesity. African-American women have expressed the belief that their culture makes them more susceptible to obesity (James, Pobee, Oxidine, Brown & Joshi, 2012). Thus, the current study sought to build upon research examining the cultural underpinnings of obesity by looking at the relationship between obesity and Black identity (as assessed by the Assimilation and Centrality scales of the MIBI). If indeed African-American women not only prefer larger body types (Gordon, Castro, Sitnikov, & Holm-Denoma, 2010), but also lack social support for weight loss (James et al., 2012; Wolfe, 2004) and in fact are frequently discouraged from losing weight (Bagley et al., 2003), it was hypothesized that those scoring high on a scale of Black identity would more readily embrace these ideals, be more likely to engage in Uncontrolled

Eating (proposed mediator 1) and less likely to exercise (proposed mediator 2), and would thus have a higher BMI.

No association was found between the Black identity scales and BMI. A strong ethnic identity has been found to predict less disordered eating (Rogers-Wood & Petrie, 2010) and a healthier body image, i.e., a reduced drive for thinness, less tendencies toward bulimia, and less body dissatisfaction (Schooler, Ward, Merriwether, & Caruthers, 2004), but it did not predict obesity in the current study. Thus, despite African-American women frequently citing culture as a barrier to losing weight, it is possible that a strong ethnic identity is associated with a healthier body image and less disordered eating of the restrictive and purging varieties and not with disordered eating related to obesity.

It is also possible that the MIBI did not adequately assess Black identity in this population or that the subscales of Assimilation and Centrality did not capture the sociocultural influences that affect obesity in African-American college aged women: the participants in both the Schooler et al. (2004) and the Rogers-Wood and Petrie (2010) studies were administered Phinney's (1992) Multigroup Ethnic Identity measure (MEIM). The MEIM consists of two factors: a cognitive and developmental factor of ethnic identity search and an affective component of affirmation, belonging, and commitment. The fact that some questions on the MEIM (e.g., "I participate in cultural practices of my own group, such as special food, music", and "I have spent time trying to find out more about my ethnic group, such as its history, traditions, and customs") reflect a more active and personal (e.g., the use of first person) approach to racial identity than the MIBI and may explain its stronger association to eating attitudes.

In addition, the participants in the current study had a lower mean score on Centrality (4.74) and higher mean score on Assimilation (5.25) than 272 African-American college students attending a predominantly White public university (5.35 on Centrality and 4.77 on Assimilation) in Vandiver, Worrell, and Delgado-Romero's study (2009). The mean Centrality score in the current study was also lower than that of African-American students attending either an Historically Black College or University (5.05) or a Predominantly White Institution (5.03) in a study by Simmons, Worrell, & Berry (2008). Thus, it is possible that the participants who elected to participate in the current study do not identify as strongly with African-American culture, which would make it more difficult to detect an association between Black identity and BMI in the current study.

External locus of control and obesity. The second part of the study incorporated locus of control as measured by the MHLC. Due to previous research that has looked at African-Americans and locus of control's impact on health behaviors such as breast cancer screening, (Peek, Sayad,& Markwardt, 2008), cervical cancer screening (Bazargan, Bazargan, Farooq, & Baker, 2004), diabetes regimen adherence (O'hea et al., 2005), and approach to cancer treatment (Mansfield, Mitchell, & King, 2002), the current study sought to determine whether locus of control also played a role in obesity. In all of the above studies, a higher external locus of control was associated with worse health behaviors or outcomes. Thus, it was hypothesized that a higher external locus of control, since it indicates a belief that health outcomes are outside one's control, would be associated with less eating restriction and less exercise, and thus a higher BMI.

External locus of control was not, however, significantly associated with BMI as predicted. This is possibly due to an over-generalization of health locus of control in

theoretical conceptualization. Although scoring high on external locus of control has been found to be associated with a number of poor health outcomes, it is possible that the health behaviors contributing to obesity are distinct from those related to cancer screening or treatment adherence.

It is also possible that there are other factors (e.g., sociocultural context) that take precedence over the role of locus of control for obesity-related behaviors. Interestingly, although external locus of control was not positively correlated with BMI as predicted, it was significantly and positively correlated with depressive symptomology, r (354) = .222, p = .01, and Assimilation, r (354) = .327, p < .01. This is consistent with research that found higher perceived control to be associated with less depression among African-American women exposed to acute or chronic stressors (Grote, Bledsoe, Larkin, Lemay, & Brown, 2007).

Finally, a separate examination of the obese group (BMI ≥ 30) may have been more likely to detect a relationship between BMI and health locus of control. This group might represent a distinct subgroup with a unique profile in terms of locus and control, as Sonntag et al. (2010) found that individuals with a BMI > 30 were more likely to attribute their weight to genetic origins, in line with an external, as opposed to an internal, locus of control.

Exercise motivation and obesity. The final component of the study incorporated exercise motivation as assessed by the BREQ-2's RAI. The BREQ-2 measures exercise motivation via a stage of change model ranging from completely non-self-determined to self-determined. African-American women report the least amount of leisure time physical activity of any ethnic or gender group (Hughes, McDowell, & Brody, 2008).

However, Rogers-Wood and Petrie (2010) found that 70 percent of overweight African-American women undergraduates wanted to lose enough weight to be in the normal weight category. Consequently, the BREQ-2 was included in order to assess one's stage of change in terms of exercise motivation. It was hypothesized that exercise motivation, along with Black identity and external locus of control, mediated by exercise activity (as assessed by the GTLEQ), would predict BMI.

The results revealed that exercise motivation was not significantly associated with BMI. One possible explanation is that the exercise motivation scores in the current study were igher than expected: Landry and Solmon (2004) conducted a study with African-American women comparing scores on the BREQ-2 and scores on the Stages of Exercise Scale (based on Prochaska's Transtheoretical model of behavioral change). They found that RAI scores were indeed higher in African-American women engaged in more advanced stages of exercise. The RAI mean for the "Exercisers" in their study (those in the Action or Maintenance stages) was 30.18, whereas the RAI mean in the current study was 32.5. The participants also had a higher mean GTLEQ exercise score (M = 46.9) than the African-American college women (M = 34.8) in McArthur and Raedeke (2009) study examining race and sex differences in physical activity. These differences in conjunction with the fact that the participants had a lower mean BMI (28.54) than anticipated suggests that the participants in the current study may represent a slimmer and more active group than is typical for this demographic. RAI was also significantly negatively correlated with external locus of control, r (354) = -.180, $p < .05$, indicating that participants who took more personal responsibility for their health were higher in exercise motivation.

Association between obesity and mood. The main finding of the study, in fact, was the significant and positive relationship between BMI and depressive symptomology. This association is not altogether surprising: In a metanalysis of obesity and depression research (Faith et al., 2011), obesity was associated with depression in 80% of the studies. Carpenter, Hasin, Allison, and Faith (2000) found that obesity was associated with a 37% increase in being diagnosed with major depression for women. This association may be amplified in the population in the current study: Sachs-Ericcson et al. (2007) found that the influence of BMI on depression was greater for African-Americans than for Whites. Moreover, Simon et al. (2006), and Siegel et al. (2000) found that the association between mood disorders and obesity was stronger for African-American women of high education, and it is possible that it would then also be higher in the study population of university students.

Study Strengths

The current study contributes to the body of literature on African-American women and obesity by further teasing out which psychological factors are important for intervention design. Although various studies have documented the contributing role of sociocultural factors to obesity in African-American women, the mechanism of influence appears to be more complex than was captured by the MIBI's Black identity Assimilation and Centrality scales. Despite the lack of findings in the predicted hypotheses, there was a significant, positive association between Assimilation and exercise activity, r (354) = .189, $p < .05$, indicating that a relationship between ethnic identity and behaviors related to BMI cannot be completely discounted. The current study also adds to the literature that has identified the association between depression symptoms and obesity, and, as such, it

highlights the need to incorporate an assessment of depression in any obesity intervention. Finally, the results of the current study suggest that targeting locus of control may not be as critical for obesity interventions as it is for other health interventions. The health behaviors that contribute to obesity, such as overeating and a lack of exercise, may not be as affected by locus of control as are behaviors such as cancer screening or even adherence to a diabetes regimen.

General Limitations

Data collection method. There were a number of factors including the data collection method, the instruments selected, and the participant pool that may have obscured the relationships between the predictors and BMI as well as limited the generalizability of the findings. In terms of limitations with data collection method, the study was entirely based on self-report. Although BMI calculations based on self-reported weight are frequently used in research and McAdams, Van Dam, and Hu (2007) found self-reported weight to be highly correlated with actual weight, Klassen, Garrett-Mayer, Houts, Shankar, and Torio (2008) reported that participants, and in particular participants of color, tend to underestimate their weight, with greater discrepancies for those of higher weight. This may be true in the current study, as the calculated mean BMI was significantly lower than that of other studies (Blanchard, 2009; Klassen, et al., 2008 Lynch, Chang, Ford & Ibrahim, 2007) and lower than the NHANES statistic of an 82.1% rate of overweight or obese among African-American women 20 and older (Ogden et al., 2014). In a future study, it could be beneficial to obtain an objective measure of BMI. It could also be useful to examine whether there are other differences,

e.g., on measures of racial identity, between participants who accurately estimate their BMI and those who do not.

In addition, the order of presentation of the measures should have been varied, or counterbalanced, in order to prevent the order effect that occurred. Participants appeared to become fatigued during survey completion and a significant proportion dropped out, resulting in the different *N*s for the various scales. Counterbalancing would have resulted in a better distribution of data, with less missing data for the measures administered toward the end of the battery.

Survey instruments: SES. Another limitation involves specific survey items. One potential issue was the use of parental education levels as a proxy for SES. The parental education level was higher than that in Vandiver, Worrell, and Delgado-Romero's (2009) study of 272 African-American college students in which 20% of the students' fathers and 15% of their mothers had at least a Bachelor's Degree. In the current study, 16% of the fathers and 33% of the mothers had at least a Bachelor's Degree. These measures were not correlated with BMI, however, an assessment of parental educational level may not have adequately captured SES as it relates to BMI: In a study by Baltrus et al. (2005), SES was significantly associated with BMI, but four measures (father's occupation, years of education, self-reported occupation, and income) were used to effectively assess SES. Thus, Baltrus et al. (2005) observed that it is important to use a cumulative factor and not just education.

An accurate assessment of SES would have been particularly important in the current study due to the significant association that was found between BMI and depressive symptomology: Siegel, Hyg, Yancey, and McCarthy (2000) found that lower

income and a greater number of pounds overweight were associated with depression, and similarly, Eisenberg, Gollust, Golberstein, and Hefner (2007) found that students with financial problems were at a greater risk for depression. Therefore, it is possible that there were associations between BMI, depression, and SES for the current population, but that the survey did not adequately assess the socioeconomic position of the participants.

Survey instruments: MIBI. In terms of potential assessment issues, it is possible that the MIBI, or the two subscales chosen, did not provide an adequate measure of Black identity. In a critique of racial identity measures, Simmons et al. (2008) reported that the MIBI has modest to moderate reliability with subscale consistency estimates in the .59 to .78 range. Moreover, Assimilation, one of the two subscales used in the current study, had the lowest estimate. It is possible, therefore, that the measure of Black identity did not adequately capture ethnic identity for the study population, particularly since the internal consistency for both the Assimilation and Centrality scales was an unimpressive .67 in the current study.

Survey instrument: BREQ-2's RAI: Chemolli and Gagne (2014) recently argued against the use of the RAI because the evidence for a continuum underlying the regulations is weak, and the index itself is statistically problematic: the RAI is a difference score and as such, less reliable statistically than individual components (Edwards, 2001). Second, difference scores may mask important information, for example, two individuals scoring high on dissimilar scales and with very distinct motivational profiles can still end up with the same composite RAI score. Chemolli and Gagne (2014) also argue that the weights assigned to the scales assume a distance between different levels of motivation may not reflect the actual distance. Moreover,

there is inadequate evidence for the weights assigned to each regulation. Since motivation is multidimensional, it may be better measured with separate scores for each type of regulation, as opposed to an aggregrate score. Thus, the RAI, a unidimensional index, may not have been sufficient for assessing the motivation level of the participants in the current study.

Participant pool. Finally, the sample population was limited to African-American women attending an Historically Black University. As such, it is possible that the participants were not representative of African-American college women in general (e.g, a lower average BMI, higher exercise motivation, higher level of maternal education). In addition, the link to the survey was sent to all African-American women (N = 2377) attending the university, but only 435 women responded. Since the introductory email and survey link made the purpose of the study clear, it is possible that the students who responded had a more vested interest in health and well-being than those who did not. Therefore, the results are not necessarily generalizable to all African-American women, or even to the subpopulation of African-American college women.

Future Directions

The current study highlights the need for further investigation into the relationships among depression, obesity, and ethnic identity. First, a suggestion for additional research on the relationship between obesity and ethnic identity: In a future study, the use of racial identity scale with higher internal consistency might shed more light on the association between obesity and identity. The Cross Racial Identity Scale might prove a better substitute for the MIBI: Simmons et al. (2008) reported that it has stronger internal consistency and structural validity than the MIBI. Additionally, an

experimental design that activates and makes cultural values and/or cultural standards of attractiveness more salient might be more likely to detect an association between ethnic identity and obesity- related behaviors. For example, some participants could be asked to read a profile or brief biographical sketch of a powerful African-American leader while participants in the control condition could read a neutral article (e.g., an article about the Empire State Building). Participants would then have the opportunity to choose from a healthy snack and an unhealthy snack. Both choice and quantity would be measured to assess whether there was a correlation (after controlling for hunger) between food choice and experimental condition. Either of these, the substitution of a different racial identity scale or an experimental design, would be helpful in determining whether ethnic identity's influence on body weight is limited to disordered eating of the restrictive or purging varieties.

Another potential area of research is that of food choices based on one's racial identity. There is much support in the obesity literature for the contributory role of African-American social customs, such as the preference for high fat and high salt (Blixen et al., 2006a; Bovell-Benjamin et al., 2009; Popkin et al., 2001) as well as sweet foods (Elfhag & Erlanson-Albertsson, 2006; Kumanyika, 2007). Study participants also cite the constant availability of food within African-American culture (Bagley et al., 2006a) and a lack of social support (Kieffer et al., 2004; Nothwehr, 2004) within the community as barriers to weight loss. Thus, scales of racial identity might not adequately capture what may be more accurately identified as sociocultural influences playing a major role in the obesity epidemic within the African-American community. It is also possible that much of the research on food preferences among African-Americans reflects

regional preferences rather than African-American preferences. Disentangling ethnic food preferences from regional food preferences could be helpful in better understanding the relationships among food choices, sociocultural factors, and obesity.

The relationship between obesity and depressive symptomology also warrants further exploration: Since, as in the current study, depression has been found to be associated with obesity, and even moreso in African-American women (Baltrus et al., 2005), a future study might benefit from the inclusion of a stress measure in order to more precisely tease out depression's relationship with obesity. Schiffman et al. (2000) found that African-American women reported higher levels of perceived stress than White women and noted that stress is associated with weight gain, and Torres and Nowson (2007) reported that chronic life stress leads to greater food intake. In addition, it could be useful to examine whether it is specifically race-related or general stress that is associated with obesity in African-Americans. Discrimination has been linked to physical health outcomes including obesity (Lewis, Cogburn, & Williams, 2015), indices of cardiovascular disease and overall mortality in African-Americans (Lewis, Aiello, Leurgans, Kelly, & Barnes, 2010). Increased knowledge about the type of stress impacting obesity would be instructive in intervention development.

Finally, the relationship between ethnic identity, depression, and obesity merits additional investigation. Walker, Wingate, Obasi, and Joiner (2008) found that ethnic identity and acculturative stress moderated depression in African-American college students. Strong ethnic identity, and specifically, higher levels of Centrality, has also been found to be associated with lower levels of stress and psychological distress (Sellers, Caldwell, Schmeelk-Cone, & Zimmerman, 2003). Although no predictions were

made in the current study regarding racial identity and depression, the results indicated a significant and positive relationship between Assimilation and depressive symptomology, r (354) = .137, $p < .05$. As noted above, a strong ethnic identity has also been found to predict less disordered eating. Siegel et al. (2000) found that low ethnic identity was an independent predictor of depression and suggested that enhancing ethnic identity would be more likely to attract individuals to lifestyle change programs, such as weight reduction programs. Thus, it appears that ethnic identity and depression may interact in some way that impacts BMI, and teasing out the manner in which this occurs would prove fruitful for future weight loss interventions.

Clinical Implications

In terms of clinical implications, the current study highlights the need to include an assessment of depressive symptoms in any overweight or obesity intervention. The PHQ-9 was significantly correlated not only with BMI but also with the weight loss related variable of exercise motivation. Since African-American women have cited less motivation at the outset of weight loss interventions, this may be further compounded in African-American women with depressive symptoms and thus further diminish their chances of a successful outcome.

In addition, the current study supports other research that has found a significant relationship between a more assimilated ethnic identity and depressive symptoms. This suggests that culturally sensitive health-related and psychological-related interventions that both enhance and target racial identity would be more effective.

Finally, the study found a positive correlation between depressive symptoms and an external locus of control. If it is indeed true that more severe levels of obesity (BMI ≥

30) are related to a higher external locus of control (Sonntag et al., 2010), and a higher external locus of control is associated with greater depressive symptoms, interventions that enhance participants' sense of personal control, or internal locus of control, could prove more effective.

Conclusion

The obesity epidemic in the United States has received an increasing amount of attention in recent years and deservedly so. Researchers have identified major increases in the percentage of obese adults; Wang and Beydoun (2007), for example, reported a jump in prevalence in obese adults from 13% to 32% from the 1960s to 2004. The trend is evident in all racial and ethnic groups, but the prevalence of overweight and obesity is higher among African-American women than any other ethnic or gender group in the United States (Adamus-Leach et al., 2013; Baltrus, Lynch, Everson-Rose, Raghunathan, & Kaplan, 2005).

Due to the deleterious health effects of obesity, including an increased risk for cardiovascular disease, type 2 diabetes, and some forms of cancer, there has been an amplified effort within the medical, public health, and psychological research communities to determine the factors that link African-American women in particular to obesity. Research has examined SES, psychosocial, biological, and behavioral correlates, because an understanding of these underlying factors is critical for designing and guiding effective obesity interventions. The current study adds to the literature by highlighting the association between depressive symptomology and obesity for African-American college aged women. An ongoing investigation into the factors contributing to obesity is of vital importance because, in addition to the need for minimizing obesity's disproportionate

impact on African-American women, Kumanyika et al. (2007) emphasized the importance of targeting African-American women as the heads of household and as such, very influential.

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APPENDIX A

ONLINE SURVEY CONSENT FORM

CONSENT TO PARTICIPATE

STUDY DESCRIPTION

This study aims to explore women's attitudes toward food, exercise, weight, and racial identity. You are being invited to participate in this study because you are a female, African-American student at Norfolk State University. The study should approximately 30 minutes to complete. For your participation you are eligible to enter a raffle to win one of two $50 gift certificates.

You must be female, between 18 and 29 years of age, and self-identify as African-American to complete this questionnaire.

PROJECT TITLE

Food and Exercise-Related Attitudes, NSU

INTRODUCTION

The purposes of this form are to give you information that may affect your decision whether to say YES or NO to participation in this research, and to record the consent of those who say YES. All questionnaires related to this project will be conducted online.

RESEARCHERS

Jamie Grisham, MPH, M.A., The Virginia Consortium Program in Clinical Psychology

Desideria S. Hacker, Ph.D., Norfolk State University, School of Graduate Studies and Psychology Department

DESCRIPTION OF RESEARCH STUDY

This research focuses on women's attitudes toward food, exercise, weight, and racial identity.

INCLUSIONARY CRITERIA

To be eligible for this study you must be between 18 and 29 years of age, female, self-identify as African-American, and a student at Norfolk State University.

EXCLUSIONARY CRITERIA

Individuals with hypothyroidism, Cushing’s Syndrome, and polycystic ovarian syndrome (PCOS) should not participate in this study.

RISKS

The information covered in this survey may be sensitive to some individuals. People may experience personal emotions regarding racial identity, food, weight, or exercise-related attitudes. The researchers do not see any additional risks for participating in this study.

BENEFITS

Benefits include learning more about your own attitudes related to food, exercise, weight, and racial identity. You will be eligible to participate in a raffle in which you can win one of two $50 gift cards.

COSTS AND PAYMENTS

There are no costs or payments associated with this study other than the time committed to complete the surveys.

NEW INFORMATION

If the researchers find new information during this study that would reasonably change your decision about participating, then they will make this available to you.

CONFIDENTIALITY

All information obtained in this study is strictly anonymous. All data will be analyzed as a whole so no survey or demographic data will be identifiable. If you chose to enter the raffle, this information will be kept separate from your survey data. The results of this study may be used in reports, presentations and publications, but the researcher will not identify you.

WITHDRAW PRIVILEGE

It is OK for you to say NO. Even if you say YES now, you are free to say NO later, and walk away or withdraw from the study at any time. Your decision will not affect your relationship with Norfolk State University, or otherwise cause a loss of benefits to which you might otherwise be entitled. The researchers reserve the right to withdraw your participation in this study, at any time, if they observe potential problems with your continued participation.

VOLUNTARY PARTICIPATION

By participating in this research study, you are saying several things. You are saying that you have read this form or have had it read to you, that you are satisfied and you understand this form, the research study, and its risks and benefits. If you have any questions later on, please contact the researchers:

Jamie Grisham, MPH, M.A., j.grisham@spartans.nsu.edu

Dr. Desideria Hacker at dshacker@nsu.edu

If there are any concerns or questions regarding the treatment of participants, please contact Dr. Rowena Wilson, Human Subjects Institutional Review Board, Chair, 757-823-9053.

By selecting NEXT I am acknowledging that I have read this page and the last several pages and agree to all indicated terms.

APPENDIX B

DEMOGRAPHIC QUESTIONNAIRE

DEMOGRAPHIC QUESTIONNAIRE

1. What is your age? _____

2. What is your gender?

Female

Male

3. Are you an undergraduate or graduate student?

Undergraduate

Graduate

4. If you are an undergraduate, what is your classification status?

Freshman

Sophomore

Junior

Senior

Not applicable

5. How would you identify yourself?

African-American/Black

Caucasian/White

Latina

Asian/Asian American

Native American

Multiracial

Other_____

6. What is the highest level of education your parents have completed?

Some high school

High school

Some college

College degree

Graduate degree

7. Do you live on or off campus?

On campus

Off campus

8. Do you have children?

Yes

No

9. What is your relationship status?

Single, never married

Single and Dating

Married/Partnered

Co-habitating

Separated

Divorced

Widowed

10. What is your height? _____ feet _____inches

11. What is your weight? _____lbs

12. What is your ideal weight? _____lbs

13. Are you currently trying to lose weight?

Yes

No

14. If you are trying to lose weight, which of the following strategies are you using?

Exercising

Eating less

Healthier diet

Appetite suppressants

Herbal remedies

Laxatives

Purging

Not Applicable

APPENDIX C

PATIENT HEALTH QUESTIONNAIRE (PHQ-9)

PHQ-9

Over the last 2 weeks, how often have you been bothered by any of the following problems?

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

APPENDIX D

MULTIDIMENSIONAL INVENTORY OF BLACK IDENTITY (MIBI)

MULTIDIMENSIONAL INVENTORY OF BLACK IDENTITY (MIBI)

	Strongly Disagree			Neutral			Strongly Agree
1. Overall, being Black has very little to do with how I feel about myself.	1	2	3	4	5	6	7
2. It is important for Black people to surround their children with Black art, music and literature.	1	2	3	4	5	6	7
3. Black people should not marry interracially.	1	2	3	4	5	6	7
4. I feel good about Black people.	1	2	3	4	5	6	7
5. Overall, Blacks are considered good by others.	1	2	3	4	5	6	7
6. In general, being Black is an important part of my self-image.	1	2	3	4	5	6	7
7. I am happy that I am Black.	1	2	3	4	5	6	7
8. I feel that Blacks have made major accomplishments and advancements.	1	2	3	4	5	6	7
9. My destiny is tied to the destiny of other Black people.	1	2	3	4	5	6	7
10. Blacks who espouse separatism are as racist as White people who also espouse separatism.	1	2	3	4	5	6	7
11. Blacks would be better off if they adopted Afrocentric values.	1	2	3	4	5	6	7
12. Black students are better off going to schools that are controlled and organized by Blacks.	1	2	3	4	5	6	7
13. Being Black is unimportant to my sense of what kind of person I am.	1	2	3	4	5	6	7
14. Black people must organize themselves into a separate Black political force.	1	2	3	4	5	6	7
15. In general, others respect Black people.	1	2	3	4	5	6	7

	Strongly Disagree			Neutral			Strongly Agree
16. Whenever possible, Blacks should buy from other Black businesses.	1	2	3	4	5	6	7
17. Most people consider Blacks, on the average, to be more ineffective than other racial groups.	1	2	3	4	5	6	7
18. A sign of progress is that Blacks are in the mainstream of America more than ever before.	1	2	3	4	5	6	7
19. I have a strong sense of belonging to Black people.	1	2	3	4	5	6	7
20. The same forces which have led to the oppression of Blacks have also led to the oppression of other groups.	1	2	3	4	5	6	7
21. A thorough knowledge of Black history is very important for Blacks today.	1	2	3	4	5	6	7
22. Blacks and Whites can never live in true harmony because of racial differences.	1	2	3	4	5	6	7
23. Black values should not be inconsistent with human values.	1	2	3	4	5	6	7
24. I often regret that I am Black.	1	2	3	4	5	6	7
25. White people can never be trusted where Blacks are concerned.	1	2	3	4	5	6	7
26. Blacks should have the choice to marry interracially.	1	2	3	4	5	6	7
27. Blacks and Whites have more commonalties than differences.	1	2	3	4	5	6	7
28. Black people should not consider race when buying art or selecting a book to read.	1	2	3	4	5	6	7

	Strongly Disagree			Neutral			Strongly Agree
29. Blacks would be better off if they were more concerned with the problems facing all people than just focusing on Black issues.	1	2	3	4	5	6	7
30. Being an individual is more important than identifying oneself as Black.	1	2	3	4	5	6	7
31. We are all children of a higher being, therefore, we should love people of all races.	1	2	3	4	5	6	7
32. Blacks should judge Whites as individuals and not as members of the White race.	1	2	3	4	5	6	7
33. I have a strong attachment to other Black people.	1	2	3	4	5	6	7
34. The struggle for Black liberation in America should be closely related to the struggle of other oppressed groups.	1	2	3	4	5	6	7
35. People regardless of their race have strengths and limitations.	1	2	3	4	5	6	7
36. Blacks should learn about the oppression of other groups.	1	2	3	4	5	6	7
37. Because America is predominantly white, it is important that Blacks go to White schools so that they can gain experience interacting with Whites.	1	2	3	4	5	6	7
38. Black people should treat other oppressed people as allies.	1	2	3	4	5	6	7
39. Blacks should strive to be full members of the American political system.	1	2	3	4	5	6	7
40. Blacks should try to work within the system to achieve their political and economic goals.	1	2	3	4	5	6	7

	Strongly Disagree			Neutral			Strongly Agree
41. Blacks should strive to integrate all institutions which are segregated.	1	2	3	4	5	6	7
42. The racism Blacks have experienced is similar to that of other minority groups.	1	2	3	4	5	6	7
43. Blacks should feel free to interact socially with White people.	1	2	3	4	5	6	7
44. Blacks should view themselves as being Americans first and foremost.	1	2	3	4	5	6	7
45. There are other people who experience racial injustice and indignities similar to Black Americans.	1	2	3	4	5	6	7
46. The plight of Blacks in America will improve only when Blacks are in important positions within the system.	1	2	3	4	5	6	7
47. Blacks will be more successful in achieving their goals if they form coalitions with other oppressed groups.	1	2	3	4	5	6	7
48. Being Black is an important reflection of who I am.	1	2	3	4	5	6	7
49. Blacks should try to become friends with people from other oppressed groups.	1	2	3	4	5	6	7
50. The dominant society devalues anything not White male oriented.	1	2	3	4	5	6	7
51. Being Black is not a major factor in my social relationships.	1	2	3	4	5	6	7
52. Blacks are not respected by the broader society.	1	2	3	4	5	6	7

	Strongly Disagree			**Neutral**			**Strongly Agree**
53. In general, other groups view Blacks in a positive manner.	1	2	3	4	5	6	7
54. I am proud to be Black.	1	2	3	4	5	6	7
55. I feel that the Black community has made valuable contributions to this society.	1	2	3	4	5	6	7
56. Society views Black people as an asset.	1	2	3	4	5	6	7

APPENDIX E

MULTIDIMENSIONAL HEALTH LOCUS OF CONTROL (MHLC-FORM A)

Form A

Instructions: Each item below is a belief statement about your medical condition with which you may agree or disagree. Beside each statement is a scale which ranges from strongly disagree (1) to strongly agree (6). For each item we would like you to circle the number that represents the extent to which you agree or disagree with that statement. The more you agree with a statement, the higher will be the number you circle. The more you disagree with a statement, the lower will be the number you circle. Please make sure that you answer **EVERY ITEM** and that you circle **ONLY ONE** number per item. This is a measure of your personal beliefs; obviously, there are no right or wrong answers.

1=STRONGLY DISAGREE **(SD)** 2=MODERATELY DISAGREE **(MD)** 3=SLIGHTLY DISAGREE **(D)**	4=SLIGHTLY AGREE **(A)** 5=MODERATELY AGREE **(MA)** 6=STRONGLY AGREE **(SA)**

		SD	**MD**	**D**	**A**	**MA**	**SA**
1	If I get sick, it is my own behavior which determines how soon I get well again.	1	2	3	4	5	6
2	No matter what I do, if I am going to get sick, I will get sick.	1	2	3	4	5	6
3	Having regular contact with my physician is the best way for me to avoid illness.	1	2	3	4	5	6
4	Most things that affect my health happen to me by accident.	1	2	3	4	5	6
5	Whenever I don't feel well, I should consult a medically trained professional.	1	2	3	4	5	6
6	I am in control of my health.	1	2	3	4	5	6
7	My family has a lot to do with my becoming sick or staying healthy.	1	2	3	4	5	6
8	When I get sick, I am to blame.	1	2	3	4	5	6
9	Luck plays a big part in determining how soon I will recover from an illness.	1	2	3	4	5	6
10	Health professionals control my health.	1	2	3	4	5	6
11	My good health is largely a matter of good fortune.	1	2	3	4	5	6
12	The main thing which affects my health is what I myself do.	1	2	3	4	5	6
13	If I take care of myself, I can avoid illness.	1	2	3	4	5	6
14	Whenever I recover from an illness, it's usually because other people (for example, doctors, nurses, family, friends) have been taking good care of me.	1	2	3	4	5	6
15	No matter what I do, I 'm likely to get sick.	1	2	3	4	5	6
16	If it's meant to be, I will stay healthy.	1	2	3	4	5	6
17	If I take the right actions, I can stay healthy.	1	2	3	4	5	6

18	Regarding my health, I can only do what my doctor tells me to do.	1	2	3	4	5	6

APPENDIX F

BEHAVIORAL REGULATION QUESTIONNAIRE (BREQ-2)

BEHAVIORAL REGULATION IN EXERCISE QUESTIONNAIRE (BREQ-2)

Age: _____ years Sex: male female (please circle)

WHY DO YOU ENGAGE IN EXERCISE?

We are interested in the reasons underlying peoples' decisions to engage, or not engage in physical exercise. Using the scale below, please indicate to what extent each of the following items is true for you. Please note that there are no right or wrong answers and no trick questions. We simply want to know how you personally feel about exercise. Your responses will be held in confidence and only used for our research purposes.

		Not true for me		Sometimes true for me		Very true for me
1	I exercise because other people say I should	0	1	2	3	4
2	I feel guilty when I don't exercise	0	1	2	3	4
3	I value the benefits of exercise	0	1	2	3	4
4	I exercise because it's fun	0	1	2	3	4
5	I don't see why I should have to exercise	0	1	2	3	4
6	I take part in exercise because my friends/family/partner say I should	0	1	2	3	4
7	I feel ashamed when I miss an exercise session	0	1	2	3	4
8	It's important to me to exercise regularly	0	1	2	3	4
9	I can't see why I should bother exercising	0	1	2	3	4
10	I enjoy my exercise sessions	0	1	2	3	4
11	I exercise because others will not be pleased with me if I don't	0	1	2	3	4

		Not true for me		Sometimes true for me		Very true for me
12	I don't see the point in exercising	0	1	2	3	4
13	I feel like a failure when I haven't exercised in a while	0	1	2	3	4
14	I think it is important to make the effort to exercise regularly	0	1	2	3	4
15	I find exercise a pleasurable activity	0	1	2	3	4
16	I feel under pressure from my friends/family to exercise	0	1	2	3	4
17	I get restless if I don't exercise regularly	0	1	2	3	4
18	I get pleasure and satisfaction from participating in exercise	0	1	2	3	4
19	I think exercising is a waste of time	0	1	2	3	4

Thank you for taking part in our research

APPENDIX G

GODIN LEISURE-TIME EXERCISE QUESTIONNAIRE (GLTEQ)

Godin Leisure-Time Exercise Questionnaire

1. During a typical **7-Day period** (a week), how many times on the average do you do the following kinds of exercise for **more than 15 minutes** during your free time (type on each line the appropriate number).

Times Per Week

a) STRENUOUS EXERCISE
(HEART BEATS RAPIDLY) _____

(e.g., running, jogging, hockey, football, soccer, squash, basketball, cross country skiing, judo, roller skating, vigorous swimming, vigorous long distance bicycling)

MODERATE EXERCISE
(NOT EXHAUSTING) _____

(e.g., fast walking, baseball, tennis, easy bicycling, volleyball, badminton, easy swimming, alpine skiing, popular and folk dancing)

b) MILD EXERCISE
(MINIMAL EFFORT) _____

(e.g., yoga, archery, fishing from river bank, bowling, horseshoes, golf, snow-mobiling, easy walking)

2. During a typical **7-Day period** (a week), in your leisure time, how often do you engage in any regular activity **long enough to work up a sweat** (heart beats rapidly)?

OFTEN	SOMETIMES	NEVER/RARELY
1. |_|	2. |_|	3. |_|

APPENDIX H

THE THREE FACTOR EATING QUESTIONNAIRE (TFEQ-R18)

THE THREE FACTOR EATING QUESTIONNAIRE—REVISED 18-ITEM

	Definitely True (4)	Mostly True (3)	Mostly False (2)	Definitely False (1)
1. When I smell a sizzling steak or a juicy piece of meat, I find it very difficult to keep from eating, even if I have just finished a meal	**4**	**3**	**2**	**1**
2. I deliberately take small helpings as a means of controlling my weight	**4**	**3**	**2**	**1**
3. When I feel anxious, I find myself eating	**4**	**3**	**2**	**1**
4. Sometimes when I start eating, I just can't seem to stop	**4**	**3**	**2**	**1**
5. Being with someone who is eating often makes me hungry enough to eat also	**4**	**3**	**2**	**1**
6. When I feel blue, I often overeat	**4**	**3**	**2**	**1**
7. When I see a real delicacy, I often get so hungry that I have to eat right away	**4**	**3**	**2**	**1**
8. I get so hungry that my stomach often seems like a bottomless pit	**4**	**3**	**2**	**1**
9. I am always hungry so it is hard for me to stop eating before I finish the food on my plate	**4**	**3**	**2**	**1**
10. When I feel lonely, I console myself by eating	**4**	**3**	**2**	**1**
11. I consciously hold back at meals in order not to gain weight	**4**	**3**	**2**	**1**

	Definitely True (4)	Mostly True (3)	Mostly False (2)	Definitely False (1)
12. I do not eat some foods because they make me fat	**4**	**3**	**2**	**1**
13. I am always hungry enough to eat at any time	**4**	**3**	**2**	**1**

14. How often do you feel hungry?

Only at meal times	Sometimes between meals	Often between meals	Almost always

15. How frequently do you avoid stocking up on "tempting foods"

Almost never	Seldom	Usually	Almost always

16. How likely are you to consciously eat less than you want?

Unlikely	Slightly unlikely	Moderately likely	Very likely

17. Do you go on binges though you are not hungry?

Never	Rarely	Sometimes	At least once a week

18. On a scale of 1 to 8, where 1 means no restraint in eating (eating whatever you want, whenever you want) and 8 means total restraint (constantly limiting food intake and never "giving in"), what number would you give yourself?	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**

VITA

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EDUCATION

2009-2015	Virginia Consortium Program in Clinical Psychology Doctor of Psychology (August 2015) University-based, APA accredited program, jointly sponsored by: The College of William & Mary, Eastern Virginia Medical School, Norfolk State University, and Old Dominion University
2012-2013	APA-ACCREDITED PREDOCTORAL CLINICAL INTERNSHIP The Johns Hopkins University Counseling Center Baltimore, Maryland
2011	Norfolk State University M.A. Community/Clinical Psychology
2005	The George Washington University M.P.H Global Health Promotion Track
2000	University of Wisconsin-Madison B.A., English/Psychology