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Perceived Behavioral Control, Stress, Body Image, and Exercise Intentions in Overweight African American Women

Heidi L. Paruch
Walden University

Walden University

College of Social and Behavioral Sciences

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Heidi Paruch

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Review Committee
Dr. Patti Barrows, Committee Chairperson, Psychology Faculty
Dr. Karen Gil, Committee Member, Psychology Faculty
Dr. Debra Wilson, University Reviewer, Psychology Faculty

Chief Academic Officer
Eric Riedel, Ph.D.

Walden University
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Abstract

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MS, Illinois State University, 2001

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Dissertation Submitted in Partial Fulfillment

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Abstract

A disproportionate number of African American women are at risk for illness and mortality due to obesity. The aim of this study was to explore perceived behavioral control (PBC), stress, body image, and exercise intentions (EI) using the theory of planned behavior (TPB) as the primary theoretical framework. The TPB is a leading model in health research to predict behavioral intentions, yet its application to the general female African American population is lacking. Seventy-nine African American women were sampled utilizing a cross-sectional, online survey method. A series of bivariate correlations tested the relationships among PBC, stress, body image, age, and physical activity with EI as the dependent variable. Findings showed that PBC and EI were significantly correlated (r = .62, p<.001). There was also a significant correlation between physical activity level and EI (r = .34, p=.003). Stress, body image, and age were not significantly correlated with EI. A standard multiple regression analysis was used to test if PBC, stress, and body image significantly predicted EI. PBC and stress explained 42% of the variance (R^2 = .42, F(3,75)=18.49, p<.001). These findings highlight the importance of strengthening PBC beliefs and reducing stress to enhance successful weight loss. Social change implications include a culturally-sensitive approach to weight loss that could help decrease obesity rates and related health problems.

Relationships between Perceived Behavioral Control, Stress, Body Image, and Exercise Intentions in Overweight African American Women

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Dedication

This research study is dedicated to my family. I am grateful to my parents who encouraged me from a young age to always reach for the stars. Their unconditional love and support has instilled confidence and strength during the tough times. I also am indebted to my husband, John, who is my rock and supports me 100%. To my grandmother, Jo Anne, for always standing behind me and telling me how proud I make her. I thank my in-laws for offering to babysit when I needed to work. This process has taken time and I appreciate having so many people in my corner.

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Chapter 1: Introduction to the Study

Introduction

Obesity is a global epidemic with numerous health implications. Weight-related health problems cost the United States billions of dollars (Finkelstein, Trogdon, Cohen, & Dietz, 2009; Wang & Beydoun, 2007), with an estimated $147 billion spent annually (Centers for Disease Control and Prevention [CDC], 2014). Afflicted health problems associated with overweight and obesity include hypertension, type 2 diabetes, coronary artery disease, stroke, gallbladder disease, osteoarthritis, sleep apnea, insomnia, and certain types of cancer (Kolotkin, Meter, & Williams, 2001; Kopelman, 2007; McTigue et al., 2006). More people die from being overweight than underweight, and nearly three million deaths occur annually worldwide from obesity-related causes (World Health Organization [WHO], 2012). Obesity-related illness is not limited to only physical disorders. There is also a high comorbidity rate between obesity and mental health problems (Blaine, 2008; Gariepy, Nitka, & Schmitz, 2010; Onyike, Crum, Lee, Lyketsos, & Eaton, 2003; Roberts, Deleger, Strawbridge, & Kaplan, 2003). Further, the stigma of obesity can prevent individuals from seeking needed medical treatment (Fontaine, Faith, Allison, & Cheskin, 1998; Needham, Epel, Adler, & Kiefe, 2010; Smits, Tart, Presnell, Rosenfield, & Otto, 2010).

On a national level, women have higher rates of obesity than men (CDC, 2014), with African American women having the highest rates overall (National Institute of Diabetes and Digestive and Kidney Diseases [NIDDK], 2013). Non-Hispanic Blacks have the highest rates of obesity nationally (49.5%), compared to 40.4% of Mexican

Americans and 34.3% of non-Hispanic Whites (CDC, 2014). Across all ethnicities, men tend to have less body fat than women (Wu et al., 2007). Given the higher burden of obesity, it is important to identify potential variables and obstacles to achieving healthy weight and wellness in overweight African American women.

Prejudicial and biased attitudes toward obese individuals are well known. Obese patients often view physician appointments negatively due to being weighed on a scale, told to lose weight, and examined physically (Hebel & Xu, 2003). As a result, overweight people often avoid medical treatment. Such avoidance of medical care can impede earlier detection of disease, contribute to poor health and decrease life span (Drury, 2002). Women report more weight discrimination than men (Carr & Friedman, 2005) and are more likely to be depressed due to feeling stigmatized (Annis, Cash, & Hrabosky, 2004). Overall, excess weight can negatively influence one's quality of life in many ways (Lynch et al., 2010).

Losing weight is often complicated. Difficulty with eating self-regulation (Teixeira et al., 2010), irregular eating schedules (Elfhag & Rossner, 2005), low self-efficacy beliefs (Bartfield, Ojehomon, Huskey, Davis, & Wee, 2010; Warziski et al., 2008), fear (Smits et al., 2010), stress (Adams, Greenway, & Brantley, 2011) and perceived lack of time (Heesch & Masse, 2004) often hamper weight loss efforts. These barriers often impede intentions to lose weight.

For years, the study of obesity has been of scientific interest in health research. Social scientists have examined genetic, environmental, sociological, and psychological factors in the etiology of obesity (Brannon & Feist, 2007). The theory of planned

behavior (TPB) is a commonly used framework to study behavior choices related to weight loss. The TPB posits that behavioral intentions are a function of individual attitudes, perceived behavioral control (PBC) and subjective norms (Ajzen, 2005, p. 118). PBC is the sense of control an individual has over a given behavior (Ajzen, 1991). In this study, I focused on PBC and exercise intentions using the TPB as the guiding theoretical foundation. Despite the accepted application of the TPB in obesity research, the theory's principles have not often been applied to African American adult women.

Stress is another primary variable of interest. The relationship between chronic stress and weight management may be one of the reasons for the weight disparity among ethnic groups (Cox et al., 2013). African American women report higher rates of stress than women of any other ethnic group (Turner & Avison, 2003). Walcott-McQuigg (1995) found a positive correlation between body weight and stress in a sample of African American women. A better understanding of the stress-body weight relationship is needed.

The third independent variable of interest in this study was body image. Body image beliefs, or the subjective picture one has of their body, has produced mixed results in the obesity literature. African American women tend to have a greater acceptance of weight than women of other ethnicities, and thus are less likely to diet and exercise for weight loss (Kumanyika, Morssink, & Agurs, 1992). I wanted to examine the relationship between PBC, stress, body image, and exercise intentions among overweight African American women as the combination of these study variables was lacking in the literature. Although the TPB is a popular framework in the study of health behaviors,

little attention has been paid to how PBC and EI interact with other known weight-related variables. The addition of stress and BI to this study allowed for a more complex evaluation of the disproportionate obesity rates among the population of interest.

The prevalence of obesity has increased at a steady rate among all races and genders over the past forty years (NIDDK, 2013). The negative health consequences of obesity have led researchers to search for more efficacious weight loss solutions, yet increased knowledge about obesity in African American women is needed for positive social change to happen. In a group that is disproportionately affected by obesity, it is important to explore variables that may lead to increased exercise intentions and improved health status. As stated, stress is known to contribute to obesity and impede weight loss efforts (Ng & Jeffery, 2003) and African American women report higher stress levels that interfere with exercise intentions (Hawkins, 2007). Social change implications for this study include the initiative to identify stress level and how to modify or channel it into the formation of exercise intentions. Further, higher levels of PBC and increased intentions to engage in exercise may foster social change through healthier and more physically active lifestyles, more regular exercise routines, better coping strategies, and thus successful weight loss. Finally, social change is present when a better understanding of body image beliefs contributes to more innovative weight loss programs that are appropriate and desirable for African American women. In addition to telling women to eat less and exercise more, health psychologists can implement a more comprehensive and culturally-sensitive approach with overweight clients. It is my hope that my research has broadened our understanding of how stress, body image, and PBC

are related to the experience of overweight African American women so that more clear-cut initiatives to increase healthier lifestyles are put in place. The remainder of this chapter contains a background of the study, statement of the problem, defined purpose of the study, theoretical foundation, list of definitions, and the study's significance and limitations.

Background

African American women are overweight and affected by obesity at a disproportionate rate compared to other groups (CDC, 2014). According to the U.S. Census Bureau (2011), an African American is "a person having origins in any of the Black racial groups of Africa" (p. 2). The study of obesity prevalence in minority women remains prominent. However, weight loss impediments to desired health behavior changes in African American women are beginning to receive more attention (Fitzgibbon et al., 2008). Health professionals now recognize that a population-based and culturally-appropriate treatment program for obesity is necessary (WHO, 2013).

It is important to look at associated risk factors of obesity to understand the challenges faced by African American women (Hawkins, 2007). Compared to other ethnicities, African American women report higher levels of stress interfering with the ability to lose weight (Kim, Borsac, DiLillo, White, & West, 2009), as well as higher rates of sedentary behavior (Nies, Vollman, & Cook, 1999). Higher rates of hypertension, diabetes, angina, and body fat draw attention to the need to focus on this particular group (Appel, Harrell, & Deng, 2002).

The study of obesity and its etiology remains manifold. Individual behavior choices, such as incorporating physical activity into a daily routine, are often associated with cultural traditions that can play a role in weight loss (Kiveniemi, Voss-Humke, & Seifert, 2007). In a study by Eyler et al. (2003), a sample of African American women identified physical activity barriers that included the lack of neighborhood sidewalks or adequate street lighting. Davis et al. (1999) found that African American women were less likely to perceive themselves as being overweight, regardless of BMI, and did not express a need to engage in regular physical activity. These findings highlight the complex nature of understanding ethnic differences and the importance of addressing weight loss programs appropriately.

The TPB is a leading health model that explains behavioral performance based on the relationship between intentions and actions (Doll & Ajzen, 1992). The use of the TPB to weight loss has shed light on strong and weak predictors of behavioral outcomes related to exercise intentions (Connor, Norman, & Bell, 2002). The TPB has demonstrated utility in predicting the cessation of cigarette smoking (Hanson, 1997), breast cancer screening (Ashing-Giwa, 1999), and condom use (Albarracin, Johnson, Fishbein, & Muellerleile, 2001) in African American women. Perceived behavioral control appears to be one of the strongest predictors of behavioral outcomes (Armitage & Christian, 2006; Brickell, Chatzisarantis, and Pretty, 2006). As described, the variables PBC, stress, and body image beliefs are relevant to the study of health psychologists to help individuals reduce weight. A gap exists in the study of PBC, stress, and body image. These variables have not been studied together in obesity research. Further, these

variables have not been applied to the experience of overweight African American women. An understanding of how PBC, stress, and body image relate to desired exercise intentions can assist health professionals in the design and implementation of better physical activity and exercise programs.

Problem Statement

African American women suffer the burden of obesity at a higher rate than men and other racial groups. They also report higher levels of stress, which interferes with weight loss efforts. The TPB is commonly used to guide health psychology and the relationship between PBC and exercise intentions in the general population is well documented. Equal attention has not been given to the study of these variables in overweight African American women. Most of the research on weight differences has focused on comparisons of African American women to other ethnicities, particularly among adolescent and college students. Studies that have applied planned behavior concepts to African American groups have largely ignored PBC in the research design (Smith-Barnes et al., 2007). Despite a plethora of obesity research and identification of factors that can impede weight loss efforts, African American women have the highest rates of obesity, stress, and weight-related health problems (CDC, 2014). Body image research shows mixed findings, warranting further attention in the overall complex process of increasing exercise to lose weight. The incongruities found within the literature warranted further investigation into PBC, stress, body image, and exercise intentions among this defined group at risk.

Purpose of the Study

The purpose of my quantitative research study was to examine the relationships between PBC, stress, body image, and exercise intentions. The target population included overweight African American women, ages 18 and older. My correlational study was cross-sectional in nature and looked at the relationship between PBC, stress, and body image in predicting exercise intentions. I utilized a survey method to describe the relationships found between the defined variables. The independent variables included PBC, stress, and body image. The dependent variable was exercise intentions. Age and physical activity were additional variables of interest. In addition to establishing any significant correlations between all the variables, I also aimed to look at the ability of the independent variables to predict exercise intentions. I wanted to learn more about the experience of overweight African American women by asking questions about PBC, stress, and body image and how these variables relate to intentions to exercise.

Research Questions

The following research questions were formulated based on the review of existing research in the areas of PBC, stress, body image, and exercise intentions. Data was gathered to test the following hypotheses.

Research Question 1: Is there a relationship between perceived behavioral control (PBC) and exercise intentions (EI) as measured by the TPB Inventory in overweight African American women?

$H_0$1: There is not a significant correlation between PBC and EI for overweight African American women.

$H_1$1: There is a significant correlation between PBC and EI for overweight African American women.

Research Question 2: Is there a relationship between stress as measured by the Perceived Stress Scale (PSS) and EI as measured by the TPB Inventory in overweight African American women?

$H_0$2: There is not a significant correlation between stress and EI for overweight African American women.

$H_1$2: There is a significant correlation between stress and EI for overweight African American women.

Research Question 3: Is there a relationship between body image (BI) as measured by the Body Image States Scale (BISS) and EI as measured by the TPB inventory in overweight African American women?

$H_0$3: There is not a significant correlation between BI and EI for overweight African American women.

$H_1$3: There is a significant correlation between BI and EI for overweight African American women.

Research Question 4: Is there is a relationship between age and EI as measured by the TPB Inventory for overweight African American women?

$H_0$4: There is not a significant correlation between age and EI for overweight African American women.

$H_1$4: There is a significant correlation between age and EI for overweight African American women.

Research Question 5: Is there a relationship between physical activity as measured by the Godin Leisure Time Questionnaire (GLTQ) and EI as measured by the TPB inventory for overweight African American women?

$H_0$5: There is not a significant correlation between physical activity and EI for overweight African American women.

$H_1$5: There is a significant correlation between physical activity and EI for overweight African American women.

Research Question 6: Does the linear combination of PBC, stress, and body image significantly predict EI.

$H_0$6: The linear combination of PBC, stress, and body image does not significantly predict EI.

$H_1$6: The linear combination of PBC, stress, and body image significantly predicts EI.

Theoretical Foundation

Health research is often guided primarily by the principles of the TPB. This leading health theory has utility in research when the aim is to gain a better understanding of the relationship between attitudes and behaviors (Doll & Ajzen, 1992). Researchers have applied TPB principles to the study of weight loss intentions and actual outcomes (Armitage & Christian, 2006). The utility of the TPB for predicting diet intentions (Armitage & Connor, 1999; Connor et al., 2002; Connor, Povey, Sparks, James, & Shepherd, 2003) and exercise intentions (Blanchard et al., 2008; Symons-Downs & Hausenblas, 2005; Sheeran & Orbell, 2000) is well documented. The TPB posits that

beliefs and attitudes strongly influence weight-related behaviors (Ajzen, 1991) and these beliefs and attitudes are related to weight loss success (Armitage & Christian, 2006).

Developed by Ajzen (2001), the TPB examines the relationship between intentions and behaviors. The best predictor of a behavioral outcome is the intention to carry out the desired behavior (Armitage & Christian, 2006). Intentions and behaviors are a function of subjective norms, attitudes, and PBC. Subjective norms are beliefs related to the perception of others, whereas attitudes are the negative and positive evaluations associated with the desired behavior. The third determinant, PBC, evaluates how easy one can obtain the goal of weight loss (Armitage, 2006). A more detailed analysis of the TPB research occurs in Chapter 2.

Leading stress theory also guided my research hypotheses. Stress is a two-way process that includes an interaction between the environment and the person (Folkman, Lazarus, Dunkel-Schetter, DeLongis, & Gruen, 1986). Lazarus proposed the cognitive appraisal theory of stress in the 1950s, and it has remained popular in psychology research (Keller et al., 2012). Lazarus (2011) promoted the importance of appraisal evaluating stress. Daily stress can contribute to obesity and interfere with weight loss attempts (Ng & Jeffery, 2003). High stress often contributes to poor food choices, lapses in diet, and the interruption of intentions to exercise (Walsh, 2011). Chronic stress can lead to long-term physiological and hormonal dysregulation, resulting in compromised health status and weight problems (McEwen & Gianaros, 2010). Difficulty managing stress over time interferes with weight loss efforts and weight regain commonly occurs (McEwen & Gianaros, 2010). Stetson, Rahn, Dubbert, Wilner, and Mercury (1997)

indicated that women reported lower self-efficacy about their ability to lose weight during periods of high stress, and they consequently exercised less than intended. In a similar study evaluating the relationship between stress and weight loss, Kim et al. (2009) found that stress levels significantly correlated with failed weight loss efforts. Block, He, Zaslavsky, Ding, and Ayanian (2009) reported similar findings, indicating that stress levels and weight regain were positively correlated after successful weight loss had occurred. Knowing that stress can impede efforts to exercise and lose weight, it made sense to look at how stress related to exercise intentions in overweight African American. Relevant stress research is discussed more thoroughly in Chapter 2.

Nature of the Study

This research study was quantitative in nature and examined the relationship between the defined variables of interest. My purpose was to gather information about overweight African American women to understand better the variables related to health and weight and how they are connected. I obtained data by utilizing an online survey method, using the Walden University participant pool and a social media site. A web-based survey approach was appropriate as my goal was to gather information at one point in time using standardized questionnaires (Babbie, 2010). Data from this correlational study was used to establish and validate relationships between the independent variables (PBC, stress, body image), and the dependent variable (exercise intentions). Age and physical activity were also examined. A quantitative method was appropriate for this study as theory guided the research questions. Further, the hypotheses were designed to

examine relationships between the independent and dependent variables (Creswell, 2009).

Definition of Terms

Attitudes: A part of planned behavior theory, the beliefs or evaluations associated with a given action/behavior (Ajzen, 2005).

Body image: An individual's concept or attitude about his or her body (Cash, Fleming, Alindogan, Steadman, & Whitehead, 2002), an independent variable examined.

Body Image States Scale (BISS): A six item inventory designed to evaluate body image (Cash et al., 2002).

Body Mass Index (BMI): For screening and diagnosis purposes BMI is calculated using a person's body weight in kilograms divided by height in meters squared (Brannon & Feist, 2007). Health care practitioners use this number as a diagnostic tool to categorize individuals as underweight, overweight, or obese (CDC, 2014).

Exercise intentions: The dependent variable in this study to measure the intention to engage in the behavior of exercise; intentions are a part of the TPB that entail one's readiness to complete a desired behavior (Ajzen, 2005).

Godin Leisure Time Exercise Questionnaire: an instrument containing three questions to assess exercise frequency of mild, moderate, and strenuous activity (Godin & Shephard, 1997).

Moderate intensity exercise: Examples include a brisk 30 minute walk, or three 10 minute brisk walks during a 24 hour period (Blanchard et al., 2003).

Obese: A medical condition characterized by excess body fat, defined as a BMI score of 30.0 or higher (CDC, 2014).

Overweight: Individuals with a BMI score in the range of 25.0-29.9 (CDC, 2014).

Perceived behavioral control: Self-efficacy, or beliefs related to the level of mastery held over a given behavior (Armitage & Christian, 2006), an independent variable measured by the TPB inventory.

Perceived Stress Scale: A ten item instrument used to measure the perception of stress and the degree to which situations are stressful (Cohen, Kamarck, & Mermelstein, 1983).

Positive energy balance: An excess of energy (calories) that exists, when the number of calories consumed exceeds the number expended (Murgatroyd et al., 1999).

Self-efficacy: Beliefs related to the capability to perform a given behavior (Bandura, 1997), often used interchangeably with Ajzen's (2005) concept of perceived behavioral control.

Stress: The independent variable of interest; conceptualized as a two way process that involves an interaction between a person and their environment involving an evaluation of whether the situation is relevant (Folkman et al., 1986), measured using the Perceived Stress Scale.

Subjective norms: The perception of social pressure related to given behaviors (Armitage & Christian, 2006).

Assumptions

There were assumptions I noted for the current study. First, I assumed that participants were interested in improving their health and had some general awareness of the general benefits of exercise. My study recruited volunteer participants, thus, I assumed the subjective responses provided were truthful. Another assumption was that the survey instruments chosen aligned properly with the defined theoretical constructs. I addressed the primary problem from the perspective of correlations and predictor variables to better understand the generated hypotheses. A quantitative study allowed for the collection and analysis of data within the sample of interest (Creswell, 2009).

Limitations

My study examined a targeted, defined group that included African American women. The data gathered were anonymously self-reported by individuals who were part of Walden University's Participant pool. I recruited participants using convenience sampling; therefore, the ability to generalize results may be limited to this identified group. More research is needed to determine if the results from this study generalize to men, other regions and/or ethnicities. Another limitation included the inability to define or describe causal relationships from data gathered (Gravateer & Wallnau, 2009). A correlational approach was warranted to describe the relationships between the defined variables; thus, I could not assume any causal relationships from data gathered.

Scope and Significance

African American women disproportionately represent obesity rates in the United States, resulting in an elevated risk for health-related problems (Lewis et al., 2005). This

group has an increased chance for the development of stress, mental health problems, and physical disease. Few studies have examined the relationship between PBC, stress, and body image and how these variables interfere with exercise intentions in overweight African American women. Despite the plethora of research being conducted on obesity, a gap remained in understanding the weight-related behaviors of overweight African American adult women residing in the states with the highest rates of obesity. A better understanding of weight-related variables and how they relate to exercise intentions was my goal. My hope was to bring awareness to the experiences of a group burdened by obesity.

The data I gathered came from individuals who were part of the Walden University Participant Pool. Data also was obtained from a social media web site, Facebook. I opened the study's criteria to all African American women who have been told by a healthcare provider or physician they are overweight or need to lose weight. The specific sample was chosen because of this group's higher rates of obesity and associated health risks. In Chapter 3, there is a detailed discussion of participant selection and study eligibility.

The goal of my study was to provide new information to the health literature about the relationship between PBC, stress, body image, and exercise intentions, all important variables in the overall picture of weight in African American women. The information I gathered offers the opportunity for overweight and obese African American women to conceptualize how stress, excess weight, and exercise intentions may be contributing to foiled attempts at weight loss. Health psychologists can better assist

individuals who want to become healthier and exercise more by helping them identify the presence of PBC, stress recognition, and body image beliefs. The significance of my study is to advance further understanding of what relates to exercise intentions in a group of women affected by excess weight. My inquiry adds to the current obesity literature by tying together PBC, stress, and body image beliefs with exercise intentions.

Summary and Transition

Obesity rates are high for African American women. Being overweight is related to an elevated risk for physical and mental health problems (Blaine, 2008). Nationwide, African American women have the highest rates of obesity compared to all other ethnic groups (NIDDK, 2013). To address this discrepancy, my study examined variables related to obesity, with the goal of evaluating how these factors relate an at-risk group. There was a critical need to look at what contributes to exercise intentions.

In Chapter 2, I review the literature that guided the research hypotheses. The utility of the TPB and how it has been applied is discussed. Stress theory and relevant stress research is covered. Body image research is also explored

Chapter 2: Literature Review

Introduction

Two theories, the TPB and stress theory, guided the direction of my research hypotheses. A leading model in health research, the TPB approaches the study of behavioral outcomes by examining the relationship between attitudes and behaviors (Armitage & Christian, 2006). This theory has received considerable support in the literature, particularly in correlational studies (Rivas & Sheeran, 2004). Stress theory also underlies the current research, with a focus on a cognitive approach to stress and cognitive appraisal (Lazarus, 2011). The physiological impact of stress can be detrimental to an individual's health and can also interfere with weight loss efforts (McEwen, 1998). The TPB and stress theory are both reviewed in the following sections.

Literature Search Strategy

A search for literature began with the utilization of Walden University's EBSCOHOST online database system and Google Scholar. The PsychArticles, MEDLINE, PsychINFO, Academic Search Complete, ScienceDirect, ProQuest, and SAGE databases provided research articles used in this dissertation. Search terms included *obesity, overweight, perceived behavioral control, body image, planned behavior theory, stress, daily stressors, primary and secondary appraisals, self-efficacy, diet intentions, weight loss intentions, weight loss, diet, race, African American women,* and a combination of these terms. A search for national statistical data was obtained via internet searches for official government data and research findings. To locate statistics related to gender, location, and race, search terms included *African American, women,*

ethnic differences, culture, and *state obesity* data. Textbooks were referenced from previous health psychology courses and a nearby university and medical school library. Hard copy and online textbooks were used as well to provide an overview of theoretical research on the topic of interest. Most of the literature reviewed spans the past ten years. However, older literature was included as necessary. Lazarus's research on stress theory was an important contributor this research and dates back to the 1950s.

Theory of Planned Behavior

In the health literature, the TPB has received significant attention. This leading theory is particularly useful when the goal is to predict or clarify specific health actions, such as weight loss (Armitage, 2006). The TPB is an extension of self-efficacy theory, which developed from research about behavioral attitudes in social psychology (Bandura, 1977). Bandura's self-efficacy theory posits that beliefs about a given behavior influence whether it will be attempted or attained (Brannon & Feist, 2007).

According to Bandura (1977), the expectations of personal efficacy (or control) over any given action determines time spent on goal achievement. Self-efficacy theory has been applied to the prediction of health performance outcomes, including smoking cessation, diet adherence, and the maintenance of an exercise regimen (Brannon & Feist, 2007). Self-efficacy emphasizes people's beliefs about the engagement in health behaviors.

Doll and Ajzen (1992) developed the theory of reasoned action to expand upon Bandura's self-efficacy theory. Doll and Ajzen found self-efficacy theory fell short due the lack of attention paid to behavioral intentions and the beliefs of others. Reasoned

action theory posits that behaviors are influenced by subjective norms and the attitudes held regarding evaluations of the behavior (Connor et al., 2003). Subjective norms include the perceived societal pressure to complete a given action (Armitage & Christian, 2006). The intentions to complete a given behavior are a mediator of the relationship between attitude and behavior (DeBruin et al., 2012). The theory of reasoned action became popular as it accounted for a large proportion of variance in the prediction of behavioral outcomes (Armitage & Christian, 2006).

Icek Ajzen proposed a more inclusive theory, the TPB, to explain the relationship between attitudes and behaviors (Schifter & Ajzen, 1985). The TPB adds another variable, PBC, which measures the degree of perceived control one has over a desired behavioral change (Ajzen, 2005) PBC relates to the personal sense of how difficult or easy a given task will be to complete (Doll & Ajzen, 1992). Attitudes, subjective norms, and PBC function as determinants of behavioral intentions that lead to behavior changes (Armitage, 2006). Attitudes include the positive and negative evaluations associated with a behavioral goal (Schifter & Ajzen, 1985). General attitudes emerge from developed belief systems. Subjective norms are the beliefs held regarding the perception of others (Rivas & Sheeran, 2004). Subjective norms include the sense of social pressure related to whether or not one should perform a given behavior (Doll & Ajzen, 1992). PBC evaluates the ease of which the desired behavior can be achieved (Armitage & Christian, 2006). PBC exhibits the level of confidence one has to complete a behavioral goal.

Researchers have demonstrated the effectiveness of the TPB in weight loss studies. Hausenblas, Carron, and Mack (1997) conducted a meta-analysis that applied

TPB variables in a group of adults joining a gymnasium. The researchers reported large effect sizes for the relationships between intentions, attitudes, subjective norms, PBC, and actual weight loss. In a similar study, Armitage and Connor (1999) evaluated the predictive validity of the TPB variables over time. They found good internal and test-retest reliability of the theory over a three month period of evaluation. Connor, Sheeran, Norman, and Armitage (2000) looked at the power of the TPB to predict long term diet intentions in a sample of adult members of a health promotion clinic. The researchers found that intentions and PBC were strong predictors of healthy food choices. These findings were consistent among the same group six years later. In an early study of TPB involving college women, Schifter and Ajzen (1985) hypothesized that intentions to lose weight were accurately predicted by attitudes, subjective norms, and PBC. Participants completed questionnaires addressing the TPB variables in relation to intentions to lose weight. Multiple regression analyses demonstrated all three variables of interest independently contributed to the prediction of weight loss intentions, with PBC demonstrating the most impact on successful weight loss (Schifter & Ajzen, 1985). A noted limitation of this study is that PBC focused solely on the six weeks of treatment and did not account for previous weight loss attempts or failures. However, this landmark study promoted the utility of the TPB and paved the way for more research. In another study evaluating the effectiveness of the TPB, Linde, Rothman, Baldwin, and Jeffery (2006) studied a group of women who were enrolled in a weight loss program. Linde et al. (2006) found that higher PBC predicted more weight loss. A strongpoint of this prospective study is that it evaluated the relationship of PBC and weight loss outcomes

over a time span of eight weeks. Nordgren, van der Pligt, and van Harraveld (2008) applied the principles of the TPB to a group of dieters involved in a commercial weight loss program study. The researchers found that hungry dieters had lower PBC related to adherence to the diet. Chang, Brown, Baumann, and Nitzke (2008) studied the relationship between self-efficacy beliefs (PBC) and fat reduction in a sample of obese mothers. Higher PBC was significantly associated with a tendency to stick to a low fat diet (Chang et al., 2008). Blanchard et al. (2008) tested the utility of the TPB to explain physical activity intentions in a group of African American and Caucasian college females. The researchers found that PBC was a significant predictor of physical activity across both groups. A noted limitation of this study is that the sample consisted only of college students.

People know about the benefits of exercise, yet many do not follow the recommended guidelines to incorporate activity into daily routines. Sedentary behavior is particularly common among individuals who are overweight and obese (Smits et al., 2010). National government guidelines recommend taking part in at least 150 minutes of physical activity per week, and at least some exercise is better than none (NIDDK, 2013). Exercise is known to help reduce depression, anxiety, and age-related cognitive deficits (Walsh, 2011). Regular exercise helps combat obesity, which can prevent and control a plethora of medical problems including hypertension, fatigue, and diabetes (Keele-Smith & Leon, 2003). For pre-existing disorders, physical activity can improve symptomology and increase mobility (Fox & Hillsdon, 2007). Physical activity contributes to increased

muscle strength, reduced pain levels and increased mobility in individuals with osteoarthritis (Rejeski et al., 2002).

The intention to exercise relate to a person's willingness to execute physical activity behaviors (Ajzen, 2005). The efficacy of the TPB in predicting exercise behavior is well documented (Blanchard, Courneya, Rodgers, Daub, & Knapik, 2002; Blue, 2007; Godin, 1993, Symons-Downs & Hausenblas, 2005). Specifically looking at exercise intentions, Hausenblas et al. (1997) found a large effect size between stated intentions to exercise and actual physical activity. They also reported a large effect size between PBC and exercise intentions (EI). Hagger, Chatzisarantis, and Biddle (2002) duplicated these results and expanded upon this analysis in their review of 72 research studies that applied TPB to physical activity behaviors. Medium and large effect sizes were reported for PBC and intention relationships, suggesting strong support for the TPB (Hagger et al., 2002). In another review, Blue (1995) examined seven cross-sectional studies that evaluated the relationship between PBC and EI. Blue found a significant relationship between PBC and EI across all studies.

There is also evidence for the TPB and the maintenance of EI. A longitudinal study by Armitage (2005) examined the predictive utility of the TPB to physical activity and maintenance of EI. Over the course of 12 weeks, exercise behaviors of 94 participants who belonged to an exercise facility were monitored. Armitage found that PBC significantly predicted EI, as well as continued efforts over time. Armitage also reported that successful exercise efforts also increased participants' PBC. In other research studying EI, Presseau, Tait, Johnston, Francis, and Sniehotta (2013) evaluated

PBC and EI in a sample of college students. The researchers hypothesized that PBC beliefs related to personal goals would predict exercise behaviors. PBC predicted exercise goals, as well as successful follow through with EI (Presseaut et al., 2013). In a related study, Galea and Bray (2006) evaluated PBC in a group of individuals who experienced pain when engaging in physical exercise. These researchers found PBC explained 67% of the variance in participants' intentions to engage in exercise. The utility of the TPB in the study of EI has consistently demonstrated strong support.

The majority of studies reviewed above have utilized samples of college students. In one of the few studies of African American women, Blanchard et al. (2008) tested the TPB to explain successful physical activity intentions in African American and Caucasian college students. Blanchard et al. reported PBC was significantly associated with predicting EI in both groups, Blanchard et al. also found attitudes and mood as significantly important factors related to EI among the Caucasian women, but not relevant to the African American women in the study. Although this study looked at the experience of the population of interest in my study, a limitation of this study includes not being able to generalize beyond the college realm. A thorough review of the TPB revealed that studies honing in on the experience of African American women outside of the college-aged environment are lacking.

Stress Theory

Stress is related to obesity and weight loss success through diet changes and exercise. Stress impacts all areas of health and can become problematic over time (Keller et al., 2012). In 2008, nearly 50% of Americans reported increased stress, with women

reporting the highest levels (American Psychological Association [APA], 2008). Daily stress that continues unmanaged can contribute to weight gain (Bjorntorp, 2001), and often interferes with weight loss intentions (Walsh, 2011).

When stress theory was first popularized in the 1930's, stress was defined as a physiological response to a stressor (Brannon & Feist, 2007). Hans Selye (1953) introduced the first popularized stress theory. Selye (1953) coined the term general adaptation syndrome, which identifies three stages involved in stress reactions: alarm, resistance, and exhaustion (Brannon & Feist, 2007). Several decades later a cognitive view of stress was popularized (Lazarus, Deese, & Osler, 1952). Cognitive stress theory proposed that situations are appraised and assessed in terms of potential outcomes. Primary appraisal evaluates the threat risk of a given situation and determining if it will be beneficial or harmful (Folkman, et al. 1986). Secondary appraisal evaluates what can be done to prevent or cope with a stressful situation. Leading stress theory shifted from the sole evaluation of physiological responses to the perception of challenges (Folkman et al., 1986). Stress became conceptualized as a two-way process consisting of an interaction between the environment and person (Folkman et al., 1986). The theories proposed by Selye and Lazarus paved the way for stress research.

Health psychologists study stress from the standpoint of how it affects the body physiologically and psychologically. Exposure to stress over time increases the risk for mental health problems (Miller, Chen, & Zhou, 2007). Depression and anxiety often occur as a result of ineffective stress management (Brannon & Feist, 2007). Other psychological symptoms from prolonged stress can include irritability, anger, fatigue,

insomnia and lack of motivation (APA, 2008). Some individuals cope more effectively with daily stress, whereas others are at an increased vulnerability to mental illness. Hay and Diehl (2010) studied daily stressors in an adult sample to examine a vulnerability to mental health problems. Hay and Diehl found younger adults were more likely to struggle with stress management; older adults had higher rates of stress when they had lower perceived behavioral control.

On a physiological level, unmanaged stress can damage and alter the endocrine system. The endocrine system is responsible for secreting hormones in the body (McEwen, 1998). Chronic stress can affect hypothalamic-pituitary-adrenal (HPA) axis function, which plays a central role in stress regulation (Bjorntorp, 2001). The HPA axis serves as a feedback loop for neuroendocrine hormones and assists in regulating important bodily process (McEwen). Allostasis, or physiological homeostasis, is defined by McEwen (1998) as the adaptive function of responding to stress. When chronic stress overloads the HPA axis, allostasis cannot occur (McEwen & Gianaros, 2010). Chronic stress leads to abnormal changes in various hormone levels, including glucocorticoids, catecholamines, growth hormones, and prolactin (Ranabir & Reetu, 2011). Ghrelin, an appetite-inducing hormone, is associated with higher stress levels (Adams et al., 2011).

Adverse physical symptoms result with unmanaged stress. Upset stomach, headache, chest tightness, teeth grinding, menstrual cycle change and erectile dysfunction are negative physical effects associated with stress (APA, 2008). Chronic stress leads to an increase in cortisol, which contributes to increased fat accumulation and difficulty with weight loss (Cox et al., 2013). Keller et al. (2012) examined national survey data to

determine the effect of perceived stress on mortality rates. High levels of perceived stress relate to poorer health status and increased risk of mortality.

Weight Loss

A plethora of obesity treatments exist for weight loss. Treatment programs are typically not successful in the long term (Lutes et al., 2008). Health researchers have attributed the rise in obesity rates to sedentary lifestyles (Swinburn & Shelly, 2008), ease of access to high fat foods (Schelling et al., 2009), and decreased physical activity at home and in the workplace (CDC, 2014). Although obesity continues to remain problematic, it is preventable.

Most health disciplines recommend a combination of diet and exercise as the primary means to reduce weight (Kolasa, Collier, & Cable, 2010; Yaskin, Toner, & Godfarb, 2009). The co-occurrence of diet and exercise are common among adult cross-sectional weight loss studies (Gillman et al., 2001; Pronk et al., 2004). A combination of diet and exercise are important for healthy weight maintenance and stress management (Kim et al., 2009). A literature review conducted by Soderlund, Fischer, and Johansson (2009) investigated studies involving trials of weight loss through physical activity and diet modification. Of the twelve studies examined, all yielded similar results: a combination of diet and exercise is necessary for substantial weight loss to occur. Miller, Koceja, and Hamilton (1997) conducted a meta-analysis examining a 25-year span of peer-reviewed literature on weight loss research using diet and exercise. Weight loss through diet alone yielded some results, but the addition of exercise exhibited significant weight reduction (Miller et al., 1997). Mata et al. (2009) examined the role of motivation

in the relationship of diet, exercise, and weight loss. Mata et al. reported an interaction effect between expressed motivation to diet and exercise, in that the motivation to engage in physical activity increased when people ate healthier foods (Mata et al., 2009). Further, the effects of both eating better and exercising continued over time. When exercise efforts increased, women in a two-year weight loss program made better food choices (Dunn et al., 2006). In a group of women trying to lose weight, Dutton, Napolitano, Whiteley, and Marcus (2008) found a positive correlation between increased physical activity and the consumption of healthier food choices.

Losing weight is not as simple as eating less and exercising more. Despite efforts to lose weight by eating better and exercising, most people do not consistently follow this recommended combination for extended periods of time (Serdula et al., 1999; Wadden, Brownell, & Foster, 2002) and usually cycle into a pattern of weight gain and loss (Wu, Gao, Chen, & vanDamn, 2009). Dibonaventura and Chapman (2008) found that people who were actively dieting and exercising underestimated the barriers they perceived as interfering with successful outcomes. Although participants reported high intentions to lose weight and voiced any expected barriers to their desired goals, they found a large inconsistency with what people intended to do and what they did (Dibonaventura & Chapman, 2008).

There is limited weight loss research related to sustained weight loss among African American women. Although diet and exercise are the primary factors related to weight loss, African American women are less likely to engage in routine physical activity (CDC, 2014) or follow a healthy diet plan (Arab, Carriquiry, Steck-Scott, &

Gaudet, 2003; Patt, Yanek, Moy & Becker, 2004). African American women who join weight loss programs are more likely to drop out and they lose less weight than other women (Baturka, Hornsby, & Schorling, 2000). When African American women attempt to lose weight, their attempts are not as long lasting or successful compared to other ethnicities (Tyler, Allen, & Alcozer, 1997). Sleep problems and chronic sleep deprivation were higher in a sample of African American adults than Caucasians, resulting in weight gain and less exercise (Bidulescu et al., 2010). In general, suboptimal diet and lack of exercise tend to co-occur more commonly in African American women when compared to other ethnicities (Gillman et al., 2001).

The Obesity Reduction Black Intervention Trial (ORBIT) study was designed specifically to address and study weight loss in African American women (Fitzgibbon et al., 2008). The ORBIT researchers randomly assigned 213 obese African American women to either weight loss intervention or control group. Participants tended to under-report daily food intake and tended to eat more than the recommended daily level of fat and calories. The ORBIT researchers concluded that diet and exercise behaviors among African American women need more attention.

There are societal factors related to weight loss differences across ethnicities. Grier and Kumanyika (2008) wanted to know why obesity rates remain high among minority groups. In their study, the researchers found that African Americans were exposed to food marketing strategies aimed at promoting fast food and junk food options at a higher rate than Caucasians. Grier and Kumanyika concluded that marketing strategies contributed to higher obesity rates in the sample they studied. Adler and

Stewart (2009) reported women in minority neighborhoods had less access to chain supermarkets and health stores with healthier food and drink choices. Another obstacle faced by African American women is the access to conveniently located health and fitness centers and commercial weight loss programs (Walcott-McQuigg et al., 2002). Walcott-McQuigg et al. (2002) interviewed overweight African American women in a weight loss program and found they were more likely to adhere to recommended diet and exercise changes when transportation was available. These researchers also reported that African American women preferred time for group support time to aid in successful weight loss.

The role of culture in the study of obesity differences offers another perspective to consider. Blixen, Singh, and Thacker (2006) formed focus groups to examine cultural differences in eating and dieting behaviors among African American and Caucasian women. The researchers found that African American women were more prone to make food choices that were influenced by their culture. Blixen et al. concluded that African American women's family history of eating was significantly important and often overrode decisions to choose food that is healthier or lower in calories. Further, African American women reported feeling more comfortable in their bodies regardless of their weight and less stigma attached to body image than Caucasian women (Blixen et al.). Kumanyika et al. (2007) found that African American women were typically the primary shopper and preparer of foods in the household and changing to healthier options did not often seem feasible. This cultural adherence may limit or lower motivation to lose weight. Because of these findings, Davis et al. (1999) proposed an ethnic-specific

approach when studying diet and exercise behaviors. The researchers suggested the application of mainstream diet and exercise programs is not the most effective way to address the needs of African American women. In a study by Shuttlesworth and Zotter (2011), African American women's adherence to their ethnic identity served as a protective factor from bulimia and anorexia, but was a risk factor for binge eating and obesity. Ethnic identification and values are important in the study of obesity.

Another cultural factor that has shown to influence weight loss is hair care and its relationship to physical activity behaviors. Hair maintenance is an important issue to African American women when it comes to physical exertion (Railey, 2000). Increased heat and sweating contributes to hair maintenance concerns and has been identified as a contributing factor to the avoidance of exercise (Williams & Yeo, 2014).

Stress and Weight

Stress can contribute to weight gain and impede efforts to shed pounds. Weight loss has documented health benefits, including the prevention of diabetes, reduced blood pressure, and lower risk for disease (CDC, 2014). Stress compromises health and threatens successful weight loss intentions. Ng and Jeffery (2003) found daily stress interrupted diet plans and increased preferences for unhealthy foods. Balfour, White, Schiffrin, Dougherty, and Defresne (1993) tested the hypothesis that stress would predict lapses in a planned diet in a group of women diagnosed with diabetes. Dietary control was difficult for women with high stress (Balfour et al., 1993). Epel, Lapidus, McEwen, and Brownell (2001) evaluated the relationship between cortisol levels and stress-induced

eating. Following stressful situations, individuals with higher stress levels ate more high sugar content foods (Epel et al., 2001).

Exposure to stress over time can result in maladaptive changes to the hypothalamic-pituitary-adrenocortical (HPA) axis (Farag et al., 2008). The HPA axis is part of the neuroendocrine system that helps the body respond to stress and maintain homeostasis (Kudielka & Kirschbaum, 2005). Over time, unmanaged stress causes the HPA axis to be chronically stimulated and impaired. Cortisol levels become abnormal and the increased risk for obesity and associated disease increase (Farag et al., 2008). Cortisol suppresses immunity, thus hyperactivity of the HPA axis is associated with decreased immune system functioning (McEwen, 1998). Prolonged stress exposure inhibits the body's ability to maintain homeostasis and thus immunity is compromised. Chronic fatigue syndrome, diabetes, hypertension, and cardiovascular disease are all associated with chronic stress and a hyperactive HPA axis (Kudielka & Kirshbaum, 2005; Patel & Hu, 2008).

Overeating is a common response to stress. Poor coping techniques and faulty appraisals can interfere with stress management (Block et al., 2009). Grunberg and Straub (1992) found when the appraisal of a situation was stressful, women chose snacks high in fat and sugar. High calorie foods were consumed instead of healthier choices that participants had previously mentioned on a planned diet. Stetson et al. (1997) studied a group of women who were exercising on their own over an eight week period. During week of high stress, women exercised less and did not meet desired physical activity and weight goals (Stetson et al., 1997). In a related study, Steptoe, Kimbell, and Basford

(1998) asked a sample of adults to keep a diary of stress, diet, and exercise behaviors to address the hypothesis that exercise would help combat daily stressors. Steptoe et al. (1998) found daily stress levels were significantly lower when participants exercised. Finally, regaining lost weight is significantly associated with difficulty combating stress and poor coping responses (Elfhag & Rossner, 2005). Stress often hampers weight loss intentions.

African American women report higher levels of stress than women of other ethnicities (Hawkins, 2007). Kim et al. (2009) identified stress as being a significant factor in racial weight disparities. African American women reported higher levels of stress than women of other ethnicities, and were more likely to drop out of weight loss programs (Kim et al., 2009). Cox et al. (2013) studied a group of African American women trying to lose weight. The experimental group of women participated in a behavioral weight loss intervention that was augmented with a stress management component. The control group received the behavioral weight loss intervention only. At the study's end, participants who received the behavioral intervention and stress management component lost more weight than those only receiving the behavioral therapy (Cox et al., 2013).

There is limited stress research study including minority women. However, in the existing literature, African American women report higher levels of stress than other women (Turner & Avison, 2003). Walcott-Mcquigg (1995) interviewed a sample of African American women to investigate the relationship between stress level and weight control. More than 50% of the women interviewed reported stress negatively affected

their weight loss efforts (Walcott-McQuigg, 1995). Walcott-Mcquigg concluded that stress interfered with the belief that weight loss efforts would be worthwhile. The need to further explore the role of stress in overweight African American women is important.

Body Image

Attitudes and cultural norms play an important role in weight loss behaviors. Body image, or the perceptions and feelings about one's body, is of interest to health researchers when studying obesity differences across groups (Cash et al., 2002). Paeratakul, White, Williamson, Ryan, and Bray (2002) pointed out that accurate body image perception plays an important role in treating obesity. For instance, overweight women who do not view their weight as problematic may be at increased risk for obesity-related disease. Despite societal messages that define obesity in a negative light, a substantial number of women report between body image perceptions that do not coincide with actual body weight (Paeratakul et al., 2002).

An examination of body image beliefs is important in addressing the process involved with successful weight loss. Poor body image beliefs have been linked to higher obesity in women (Carraca et al., 2011) and correlate with higher levels of depression and diminished quality of life (Cash, Phillips, Santos, & Hrabosky, 2004). African American women tend to have a greater acceptance of body weight than women of other ethnicities, and thus are less likely to diet and exercise for weight loss (Kumanyika et al., 1992; Senekal, Steyn, Mashego, & Nel, 2001). In a meta-analysis by Roberts, Cash, Feingold, and Johnson (2006), 55 studies were reviewed about body image perceptions of Caucasian and African American women. Roberts et al. (2006) found that African

American women held more positive body image perceptions than Caucasian women. The most significant difference between these two groups was the largest for women in their 20s and decreased as women turned 40. Parker et al. (1995) conducted a similar study and compared weight concerns and body image beliefs between African American and Caucasian adolescents. African American females reported a wider range of body acceptance and were more satisfied with their weight than the Caucasian females (Parker et al., 1995).

Mainstream media often displays desired thinness as the culprit for distorted body image issues (Greenwood & Dal Cin, 2012). African American women are less likely to relate to the media's ideal of thinness (Jefferson & Stake, 2009). Sabik, Cole, and Ward (2010) reported women who link feelings of self-worth to their weight voiced greater body image dissatisfaction. Sanchez and Crocker (2005) found that African American women showed lower reliance on external expectations of thinness than women of other ethnicities. In an older study, Harris, Walters, and Waschull (1991) found that African American men were more likely to view overweight women as being more desirable than the Caucasian men. The authors suggested that better personal and societal acceptance of body weight in the African American women contributed to less pressure to lose weight for health reasons.

A strong identification with African American culture may serves as a buffer against the negative body images of extreme thinness in mainstream media (Rogers & Petrie, 2010). Flynn and Fitzgibbon (1998) suggested that stronger body image

perceptions have contributed to this group's high obesity rates. A strong positive body image may decrease motivation to lose weight and live a healthier lifestyle.

Conflicting research indicates that body image differences across race are not as apparent as in years past. A separate body of literature indicates that disparities among body image beliefs have decreased (Demarest & Allen, 2000; Shaw, Ramirez, Trost, Randall, & Stice, 2004) and it is more important to evaluate body image on a more individualized level (Davis et al. 1999). Baturka, et al. (2000) reported that many overweight and obese African American women are very dissatisfied with their weight and report a negative body image. Using figure drawings, Demarest and Allen (2000) found that both African American and Caucasian women misjudged body shapes the opposite sex would rate as being attractive. Both ethnicities were unsatisfied with their current body weights and wanted to be thinner (Demarest & Allen, 2000; Singh, 1994). Mixed findings in the body image literature highlighted the need to address body image as a variable in my research, particularly in relation to how body image beliefs relate to exercise intentions in overweight African American women.

Summary and Transition

Health psychology research has relied heavily on the principles of TPB to better understand obesity and weight loss. Researchers support the TPB and its utility to weight loss in the health literature (Armitage & Christian, 2006). Researchers continue to study what interferes with weight loss intentions by identifying the factors involved in success or failure. Barriers to weight loss, including poor PBC, have been identified as interfering with desired weight loss and improved health. How these barriers specifically relate to

exercise intentions of adult African American women in states with high obesity remains understudied. Thus, the close examination of this at-risk population is important to contribute to the current literature to fill this gap.

The purpose of this study was to take a closer look at PBC, stress, and body image in relation to how these factors relate to the exercise intentions of overweight African American women. I evaluated these factors to gain a better understanding of weight-related beliefs and intentions of African American women. As Fitzgibbon et al. (2008) pointed out, the factors related to weight loss and the perceived control to follow through with stated intentions are lacking in the literature and need further attention. Chapter 3 discusses the study's research design, approach, setting, instrumentation, materials, and ethical considerations for participants.

Chapter 3: Research Method

Introduction

African American women comprise a group of individuals who are disproportionately affected by excess weight. As such, the primary purpose of my research study was to examine factors that are known to be related to obesity. Specifically, I was interested in evaluating how PBC, stress, and BI are related to exercise intentions. The research questions were designed to establish any significant relationships among the defined variables using Pearson product moment correlations. Multiple regression analysis was also used to evaluate the ability of the independent variables (PBC, stress, BI) to predict exercise intentions (EI) in overweight African American women. Age and baseline physical activity level were additional variables of interest.

The following chapter lays out the methodology used in this research study. In Chapter 3, I describe the rationale and design, including how the sample was selected, its size, and the instrumentation used. Data analysis, ethical considerations, and the protection of participants' rights are also discussed. Threats to validity are discussed to conclude this chapter.

Research Design and Rationale

In my study, I utilized a quantitative method to explore the variables of interest. A quantitative approach was appropriate as theory guided the current research questions and hypotheses (Creswell, 2009). I sought to better understand the relationship between PBC, stress, and BI by identifying how these variables relate to intentions to exercise. PBC and

EI were measured using an established TPB Inventory, as this theory's application to exercise research is longstanding (Armitage, 2005). Stress was measured using the Perceived Stress Scale (PSS). I measured BI using the Body Image States Scale (BISS). To measure physical activity, I used Godin's Leisure Time Questionnaire (GLTQ). I sought to gain the most objective data available using a quantitative approach.

An online cross-sectional, correlational approach was utilized with validated survey instruments. A cross-sectional design was appropriate because I sought to examine relationships between the independent and dependent variables (Creswell, 2009). Cross-sectional surveys offer the advantage of recruiting a relatively large sample and interviewing participants at one defined point of time (Babbie, 2007). Data can be collected quickly and inexpensively in survey research (Cresswell, 2009). Surveys also provide for flexible analysis as needed. Survey research does not, however, allow for the inference of causation (Babbie, 2007). For the purpose of my research, a cross-sectional approach was deemed as being most appropriate. My goal was to obtain descriptive information about the population rather than show a cause-effect relationship.

Setting and Sample

I utilized convenience sampling to recruit volunteers online, using both Walden University's participant pool and a social media web site, Facebook. Both of these recruitment methods allowed for gathering information from a diverse population around the world. The participant pool at Walden University is a resource for students, staff, and faculty to participate in research studies. Information about the study's purpose and inclusion criteria is posted on the web site. My study was open to all African American

women ages 18 and older who had ever been told by a physician or healthcare provider they are overweight or need to lose weight. Ineligibility criteria included women who were pregnant or nursing because weight changes are typical and not indicative of usual body weight.

Due to the sensitive nature and stigma of obesity, the confidential non-identifying approach of an online pool and social media was desirable. The participant pool is voluntary for students, faculty, and staff members who comprise Walden University. A link posted to Facebook stressed the voluntary and anonymous nature of the study. I collected demographic information including gender, age, race, state of residence and baseline physical activity level. No other identifying information was collected and all surveys were coded numerically to identify each response set.

A power analysis was performed to estimate the sample size necessary to find a true effect. Crosby, DiClemente, and Salazar (2006) recommended a standard power level of .80, as this is an estimated ability of the defined statistical tests to find true differences between the variables of interest. Cohen (1992) warns of setting power at less than .80 as there is a risk for Type II error. A Type II error, or false negative, occurs, when results are declared incorrectly insignificant. Based on these recommendations, power level was set at .80 for this study.

Power analysis is affected by alpha level, sample size, and effect size (Burkholder, n.d.). An alpha level of .01 or .05 is standard. A larger alpha level improves the chance that the null hypothesis will be accurately rejected (Cohen, 1992). Therefore, an alpha level of .05 provides a standardized criterion that any results found will be

significant (Gravateer & Wallnau, 2009) and was set at .05 for my study design. Effect size is commonly measured using Cohen's (1992) recommendations for small, medium, or large differences. A medium effect size (.15) and power set at .80 is appropriate in conventional research planning (Cohen, 1992). The minimum required sample size needed for this study was computed using G*Power 3.1.7 (2012). The selected test was F test linear multiple regression: fixed model, single regression coefficient, with three predictor variables. With an alpha of .05, an estimated medium effect size (.15), and power of .80, a minimum sample size of 77 participants was required.

Data Collection and Analysis

I recruited participants in two ways. I used Walden University's online participant pool program by announcing the study on Walden University's website. A link detailing my study's information was also posted on the social media web site, Facebook. Individuals who met criteria and wanted to participate were asked to complete the web-based study, via the online survey tool, Survey Monkey. Upon entering the web site surveymonkey.com, participants were asked to complete the informed consent process and agree to the terms of the study. Survey participation began after consenting to the terms. The surveys consisted of (a) a demographic questionnaire, (b) TPB inventory, (c) PSS, and (d) BISS. I provided personal contact information and that of the Walden University research representative on the informed consent portion of the survey. I informed participants they could contact me with any questions or debriefing information.

The first attempt to obtain a desired sample size of 77 participants was made by opening the study for 12 weeks. After that 12 week period, only a few completed surveys had been obtained. I expanded the data collection for another 12 weeks and collected approximately half of the surveys needed. As a result, I extended the deadline for another 12 weeks to gather the number of surveys needed. I closed the survey with 141 completed surveys. Of those 141 surveys, only 79 were complete and met the study's criteria.

Participants completed and submitted the survey materials online anonymously. Individuals were assigned a participant ID. No identifying information was collected. I have direct access to the data on Survey Monkey for review and analysis. The data collected on Survey Monkey is password protected and only I have access to the secure information. I reviewed the surveys for incomplete or missing data. Incomplete surveys were not used in analysis. After cleaning the data by looking for incomplete surveys and major inconsistencies, I transferred it from Survey Monkey to a statistical analysis program.

Descriptive statistics were used to describe demographics (age, race, state of residence, and physical activity level), as well as the means for the variables of interest in the study. Correlations between all variables were conducted to determine any significant relationships. Although correlation is not indicative of causality, the correlation coefficient is a commonly used measure of the size of an effect (Field, 2009). Standard multiple regression analyses were also employed to evaluate the ability of PBC, stress, and body image to predict exercise intentions. Multiple regression analysis was useful to

evaluate the ability of three independent variables to predict EI, the dependent variable. Data was analyzed using the SPSS 16.0 (SPSS, Inc., 2008).

Instrumentation and Materials

Data for the current study was collected using the survey instruments listed below.

Perceived Stress Scale

The Perceived Stress Scale (PSS) is a survey instrument designed for measuring the perception of stress (Cohen et al., 1983). Cohen et al. (1983) developed the measure in the early 1980s based on Lazarus's theory of stress appraisal. The PSS was originally a 14-item self-report inventory. The 10-item version of the PSS is more recent and was revised by dropping four items from the original scale that had the lowest factor loadings during factor analysis (Cohen, 1994). The PSS was designed for individuals with diverse cultural backgrounds with at least a junior high education (Cohen et al., 1983). Specifically, the PSS is intended to identify "the degree to which situations in one's life are appraised as stressful" (Cohen et al., 1983, p. 385). In my study, stress is an independent variable and was measured by the PSS.

The PSS has demonstrated "adequate internal and test-retest reliability" (Cohen et al., 1983, p. 392). Cohen and Williamson (1988) reported Cronbach's alpha coefficient at .78 for the PSS 10-item providing evidence for good internal consistency. Evidence for construct validity has been demonstrated in samples of college students, individuals in smoking cessation programs, and in a general sample of 2,387 adult Americans (Cohen & Williamson, 1988). Overall, the PSS has shown substantial reliability and validity and is

thus a commonly utilized tool for the assessment of stress appraisal. Cohen and Williamson recommend using the PSS 10-item because of its good internal reliability and predictive validity, which are slightly higher when compared to the PSS 14-item. The PSS is freely available for use without the need of written permission when use of the scale is for academic research. However, I notified the developer of the intended use of the instrument for my research.

Demographic Variables

I used a brief standard survey to obtain relevant demographics. I asked participants to report their age, gender, state or country of residence, and if they were pregnant. Participants were also asked if they have ever been told by a physician or healthcare provider they are overweight or needed to lose weight.

Theory of Planned Behavior Inventory

Measurement of the TPB constructs has been accomplished in many ways. Ajzen (1991) noted that for accurate prediction of PBC and intentions, the two variables must correspond to one another. In this study, intentions were assessed as "intention to engage in physical activity" and PBC was measured as "perceived control over the intention engage in physical activity. Ajzen also recommended that PBC and intentions should remain stable during assessment to accurately assess behavior.

I searched literature for an appropriate inventory that used questions related to my research. Blanchard et al. (2008) applied the TPB to African American and Caucasian college students with regard to explaining PBC and physical activity intentions. Blanchard et al.'s study is similar to my study because (a) both samples include African

American women, (b) both studies hypothesize that PBC will predict exercise intentions, and (c) evaluate both correlation and regression analyses. The subscale designed by Blanchard et al. to measure PBC includes three questions, using a 7-point scale ranging from 1 (not at all confident) to 7 (extremely confident). Internal consistency for the PBC subscale was strong (Cronbach's alpha=.81).

Exercise intentions were measured using the TPB subscale designed by Blanchard et al. (2008). Three questions will assess exercise intentions using a 7 point Likert scale. Blanchard et al. reported strong internal consistency for these 3 items (Cronbach's alpha= .05).

Godin Leisure Time Questionnaire

The Godin Leisure Time Questionnaire (GLTQ) is a 2 item survey designed to measure physical activity in a typical week. The GLTQ assesses the intensity of exercise during free time over the course of seven days (Godin & Shephard, 1997). The first question asks how often one engages in strenuous, moderate, and mild exercise in a typical week. The total score is obtained by multiplying the response in each category by its intensity (mild-3, moderate=5, strenuous=9), then summing all three levels. Higher scores are indicative of higher levels of exercise activity. Godin and Shephard (1997) recommend interpreting a score of 24 units or more as providing substantial benefits of exercise, 14-23 units provide moderate benefits of being physically active, and less than 14 units demonstrates insufficient physical activity. The second question asks how often a person exercises long enough to work up a sweat in a typical seven-day period.

The GLTQ has established reliability and validity. van Poppel, Chinapawa, Mokkink, van Mechelen, and Terwee (2010) evaluated the GLTQ and found construct validity ranged from *r*=.32-.45 when compared with other inventories and accelerometer-based instruments. Godin and Shephard (1985) reported good reliability of the GLTQ early on, with the strongest correlation between maximal oxygen consumption and strenuous exercise (*r* =.35). The authors of the GLTQ reported a total reliability of .74 in a sample of 306 healthy adults. The GLTQ is available for public use. The GLTQ was used to measure physical activity level.

Body Image States Scale

Body image beliefs were measured using the Body Image States Scale (BISS). The BISS consists of six items designed to determine satisfaction with one's body and physical appearance (Cash et al., 2002). It is designed to measure current thoughts and beliefs, or how respondent feels "right now" (Thompson, 2002). Three of the inventory items are reverse scored. Then the mean of the six items is taken to provide the scale score. Higher scores reflect higher body image satisfaction. Lower scores are indicative of more negative body image beliefs (Cash et al., 2002).

The BISS has established internal consistency and construct validity, and convergent validity. Internal consistency for the BISS was .77 for women and test-retest reliability was .69 for women (Cash et al., 2002). Higher scores on the BISS indicate higher degrees of body dissatisfaction.

Description of Variables

Several variables were evaluated in this study. The dependent variable was exercise intentions, which was measured using three designated questions on the TPB Inventory. The first independent variable of interest was PBC, or the perception of ease one has over completion of a behavior. PBC was measured using three questions from the TPB inventory (See Appendix C). Stress was another defined independent variable. It was measured using the 10 items of the PSS (See Appendix E). Example items included "in the last month, how often have you felt that you were unable to control the important things in your life?" and "In the last month how often have you felt difficulties were piling up so high that you could not overcome them?" The third independent variable of interest was body image. Body image was measured using the BISS (See Appendix D). Two other variables were age and physical activity level. Age was measured as a continuous variable on the demographic survey. Physical activity level was measured using the GLTQ (See Appendix B).

Research Questions and Hypotheses

Research Question 1: Is there a relationship between perceived behavioral control (PBC) and exercise intentions (EI) as measured by the TPB Inventory in overweight African American women?

$H_0$1: There is not a significant correlation between PBC and EI for overweight African American women.

$H_1$1: There is a significant correlation between PBC and EI for overweight African American women.

Research Question 2: Is there a relationship between stress as measured by the Perceived Stress Scale (PSS) and EI as measured by the TPB Inventory in overweight African American women?

$H_0$2: There is not a significant correlation between stress and EI for overweight African American women.

$H_1$2: There is a significant correlation between stress and EI for overweight African American women.

Research Question 3: Is there a relationship between body image (BI) as measured by the Body Image States Scale (BISS) and EI as measured by the TPB inventory in overweight African American women?

$H_0$3: There is not a significant correlation between BI and EI for overweight African American women.

$H_1$3: There is a significant correlation between BI and EI for overweight African American women.

Research Question 4: Is there is a relationship between age and EI as measured by the TPB Inventory for overweight African American women?

$H_0$4: There is not a significant correlation between age and EI for overweight African American women.

$H_1$4: There is a significant correlation between age and EI for overweight African American women.

Research Question 5: Is there a relationship between physical activity as measured by the Godin Leisure Time Questionnaire (GLTQ) and EI as measured by the TPB inventory for overweight African American women?

$H_0$5: There is not a significant correlation between physical activity and EI for overweight African American women.

$H_1$5: There is a significant correlation between physical activity and EI for overweight African American women.

Research Question 6: Does the linear combination of PBC, stress, and body image significantly predict EI.

$H_0$6: The linear combination of PBC, stress, and body image does not significantly predict EI.

$H_1$6: The linear combination of PBC, stress, and body image significantly predicts EI.

Threats to Validity

In this study, potential threats to validity are noted. Threats to internal validity were low as this study was correlational in nature and I did not attempt to determine causation between variables. A threat to external validity is noted due to the use of convenience sampling. Because this form of sampling was not random, I could not be certain that the information collected from this particular group of African American women generalizes to the population. Attempts to increase construct validity were made by selecting instruments that have documented high reliability and validity.

Ethical Participation of Participants

The Institutional Review Board (IRB) evaluated my completed application to conduct my proposed research. I was assigned IRB approval number 02-16-15-0042124. Upon approval, all individuals were issued an informed consent form online that described the nature of the study, minimal risk involved, and the right to withdraw or stop participation at any time. It was noted that participation was completely voluntary. Informed consent information was available on the first page of the link on surveymonkey.com and participants had to agree to the research terms before proceeding to the survey. There was minimal harm associated with this study as only opinions and beliefs were obtained. Participants were informed that they could withdraw from the study at any time without penalty and their data would not be used if they chose to not complete the study. Participants were informed that some feelings of discomfort may arise due to thinking about and answering questions related to weight, stress, and exercise intentions. There was no administration of treatment.

The confidentiality and protection of participant' rights was of great importance in this study. Data were coded numerically so there was no identifying information linked to individual participants. All data is securely stored on my personal computer with a secured password. Survey Monkey utilizes SSL encryption to manage secure information within their web site. My contact and school information was made available to all participants during the survey process via Survey Monkey. All participants were informed that their responses would be kept confidential and reported only in a

population distribution. I also informed participants that data would be maintained for a period of five years as required by Walden University.

Summary

In Chapter 3, I described the study's design, rationale, setting, sample, data collection and analysis procedures, instrumentation, research questions, and definitions of variables. I also covered confidentiality and the ethical considerations of participants. My study was designed to evaluate weight-related beliefs and behaviors of overweight African American women residing in the United States. In Chapter 4, I discuss the study results and findings.

Chapter 4: Results

Introduction

The purpose of my study was to assess known weight-related variables in a sample of overweight African American women. Using the TPB as the foundation, I evaluated whether PBC, stress and BI predict one's EI. Additional variables of interest included age and PA. In Chapter 4, I discuss the research findings. First, the measurement tools are described. Second, I discuss the procedures related to data collection and the time frame of the study. Third, I describe the demographic characteristics of the sample. Next, I review univariate findings and summarize data graphically with a correlation matrix. Finally, the results about the research questions are discussed. Bivariate correlations were used to evaluate the first five hypotheses and determine if any significant relationships were present between the defined variables. Standard multiple regression analyses were employed to evaluate the sixth research question to determine if PBC, stress, and BI predict EI scores. Tables are presented as appropriate to summarize study results.

Measurement Tools

The survey questionnaires used in this study to measure the defined variables are described next and summarized in Table 1. A brief demographic questionnaire asked participants their race, age, state/country of residence, and if they were pregnant or nursing. Four additional surveys were utilized, including the Theory of Planned Behavior Questionnaire, Perceived Stress Scale, Body Image States Scale, and Godin's Leisure

Time Questionnaire. Mean scores and the range of participant responses on each inventory are reported. Normal/appropriate outcomes and score ranges are also discussed.

Theory of Planned Behavior Questionnaire (TPBQ)

Blanchard et al. (2008) designed the TPBQ to measure the various constructs of the theory of planned behavior. To measure PBC, I used the three items Blanchard et al. created from TPB research: (a) "During the next week, how confident are you that you can accumulate 30 minutes of moderate-intensity physical activity at least five days?" (b) "During the next week for me to accumulate 30 minutes of moderate-intensity physical activity will be…" and (c) "During the next week, how much control do you believe you have to accumulate 30 minutes of moderate-intensity physical activity?" All three questions are rated on a 7 point Likert scale, with possible scores ranging from 3-21. Lower scores are indicative of lower PBC, and higher scores are indicative of greater PBC.

The dependent variable in this study, exercise intentions (EI), was also measured using items constructed for the TPBQ. The three questions developed by Blanchard et al. (2008) to assess intentions to exercise were used in this study. These items included: (a) "During the next week, I intend to accumulate 30 minutes of moderate-intensity physical activity at least five days", (b) "During the next week, I will try to accumulate 30 minutes of moderate-intensity physical activity at least five days", and (c) "During the next week, my goal is to accumulate 30 minutes of moderate-intensity physical activity on at least ___ days". This subscale has a potential for 21 total points, with scores ranging from 3-21. Higher scale scores represent greater EI.

Perceived Stress Scale (PSS)

The PSS was developed by Cohen et al. (1983) based on Lazarus's (1952) theory of stress appraisal. I utilized this inventory to measure stress. The 10-item inventory is designed to measure the degree to which situations appraise as stressful in one's life. Items include questions such as, "In the last month, how often have you been upset because of something that happened unexpectedly?" and "In the last month, how often have you felt that you could not cope with all the things you had to do?" The ten questions are scored on a 5 point Likert scale, which scores ranging from 0=never to 4= very often. Four of the PSS items are reverse scored and then summed for a total score. Scores on the PSS can range from 0 and 40 with higher scores indicating higher levels of reported stress.

Body Image States Scale (BISS)

The BISS was developed by Cash et al. (2002) to measure an individual's evaluative and affective body image states. It was utilized to measure the independent variable, BI. The BISS consists of six 9-point Likert scale items. Scores are obtained by taking the composite mean of the six items after reverse scoring three of the designated questions. Low scores are indicative of more negative body states, and high scores represent more positive body image states.

Godin Leisure Time Questionnaire (GLTQ)

The GLTQ was developed by Godin and Shephard (1997) to assess self-reported leisure time physical activity. This short inventory consists of two questions. I used the first item to assess the independent variable, PA. The GLTQ's first question asks how

many times per week an individual engages in varying levels of PA, across three categories of intensity (strenuous, moderate, and mild). It is scored by first computing the frequencies of strenuous, moderate, and mild activities and then multiplying that sum by 9, 5, and 3 respectively. These three scores are then summed.

Table 1

Independent and Dependent Variables

Variable	Type	Instrument	Variable Scale	Composition
PBC	Independent	TPB Inventory	7 pt Likert	Items 1,2,3
Stress	Independent	PSS	5 pt Likert	Items 1-10
Body Image	Independent	BISS	9 pt Likert	Items 1-6
Age	Covariate	Demographic	18 and older	Age in years
PA	Covariate	GLTQ	Sum of activity minutes	Item 1
EI	Dependent	TPB Inventory	7 pt Likert	Items 4, 5, 6

Data Collection

Data was collected over the course of 18 weeks during the summer of 2015. Initially, Walden University's Participant Pool was the sole source for data collection. However, I only had obtained a few completed studies after the first 12 weeks. I completed an IRB addendum and was approved also to collect data using social media, via Facebook. For the following six weeks, data was collected using both Walden University's Participant Pool and through a survey link posted to Facebook. Weekly reminders about the survey were posted to Facebook until data collection was complete. A total of 141 women participated, but 62 surveys were incomplete or did not meet criteria. As a result, 79 completed surveys qualified for the study's eligibility requirements.

Sample Demographics

The target demographic for this study included African American women who had ever been told by a physician or healthcare provider that they are overweight or needed to lose weight. Women who marked they were pregnant or nursing were excluded from the study as weight changes during pregnancy are expected. Of the 79 women in the study, the range of age was 20-67 years, with a mean of 42.18 ± 11.0 (SD) years.

All women reported African American as their race. Five women (6%) marked an additional race. Of these five women, two participants reported race as American Indian., one participant typed in text that she was "African American/Native American/White", one participant identified as Guamanian, and one participant reported Hispanic. Most of the sample (99%) resided in 22 different states. The results showed higher percentages of

participants residing in the Midwest states of Illinois (19%), Indiana (13.9%), and Missouri (17.4%). One participant reported living outside of the United States (Nigeria).

Descriptive Statistics

I calculated descriptive statistics for each variable of interest, calculating the mean, minimum, maximum, and standard deviation for all categorical variables (Table 2). Participants' age and total score for PBC, PA, and EI were used. Due to a missing value from five women on the PSS, each participant's total summed score was replaced with a mean score based on the number of items answered on the inventory. Mean BISS scores were used as specified in the scoring instructions.

Table 2

Descriptive Statistics of All Variables

	N	Minimum	Maximum	Mean	Std. Deviation
Age in Years	79	20	67	42.18	11.00
Stress Score	79	.30	3.70	1.54	.64
PA Score	79	0	95	27.15	20.46
PBC Score	79	4	21	13.16	4.38
EI Score	79	4	21	12.32	4.40
BI Score	79	1.67	8.83	4.58	1.45
Valid N (listwise)	79				

Note. PA=physical activity; PBC=perceived behavioral control; EI=exercise intentions, BI=body image.

To gain insight into the relationship among all the variables of interest, a correlation matrix was created (Table 3). Pearson product-moment correlation coefficients were computed to establish any meaningful relationships among the defined variables. Due to the large number of statistical tests conducted, significance was set at

$p<0.01$. Perceived behavioral control (PBC) was found to be significantly correlated with physical activity (PA). As PBC levels increased, there was an increase in time spent engaging in PA. There was also a significant correlation between PA and EI. As PA levels increased, there was an increase in EI. Finally, PBC was found to be positively correlated with EI. As PBC increased, there was an increase in EI.

Table 3

Pearson Product Moment Correlations Among the Variables

Variable	Age	Stress	PA	PBC	EI	BI
Age	_	-.026	-.193	-.111	-.075	-.089
Stress	-.026	_	.155	-.213	.044	-.214
PA	-.193	.155	_	.377**	.335**	-.004
PBC	-.111	-.213	.377**	_	.622**	.143
EI	-.075	.044	.335**	.622**	_	.101
BI	-.089	-.214	-.004	.143	.101	_

Note. **p<.01, two-tails, N=79.

Hypothesis Testing

Pearson product-moment correlation coefficients were calculated to test the first five hypotheses. Preliminary analyses were first conducted to check for the violations of normality, linearity, and the presence of outliers. Histograms and Q-Q plots were created

for a visual assessment of the data. The Shapiro-Wilk statistic flagged significant results ($p < .05$) for the data's distribution, which suggested a violation of the assumption of normality. However, visual inspection of the Q-Q plots and histograms revealed distributions that were approximately normal. Further, small deviations from normality are acceptable due to the large sample size and robustness of Pearson's product-moment correlation (Field, 2009). Scatterplots revealed linear relationships between the defined variables. Potential outlier scores were kept in the analysis because these values fell within the normal range of test scores. The criterion for significance was set at the standard .05 based on Cohen's (1992) recommendation for testing both one and two tailed hypotheses.

Hypothesis 1

Is there a relationship between perceived behavioral control (PBC) and exercise intentions (EI) as measured by the TPB Inventory in overweight African American women?

$H_0$1: There is not a significant correlation between PBC and EI for overweight African American women.

$H_1$1: There is a significant correlation between PBC and EI for overweight African American women.

There was a strong positive correlation between PBC and EI (r =.622, n=79, p< .001), thus the null hypothesis was rejected. African American women who reported higher PBC also reported higher EI scores.

Hypothesis 2

Is there a relationship between stress as measured by the Perceived Stress Scale (PSS) and EI as measured by the TPB Inventory in overweight African American women?

$H_0$2: There is not a significant correlation between stress and EI for overweight African American women.

$H_1$2: There is a significant correlation between stress and EI for overweight African American women.

There was no significant correlation between stress level and EI (r=.044, n=79, p=.70), thus the null hypothesis was not rejected. Stress level was not significantly related to the EI score.

Hypothesis 3:

Is there a statistically significant correlation between body image (BI) as measured by the BISS and EI as measured by the TPB inventory in overweight African American women?

$H_0$3: There is not a significant correlation between BI and EI for overweight African American women.

$H_1$3: There is a significant correlation between BI and EI for overweight African American women.

There was no significant correlation between BI and EI (r=.101, n=79, p=.375). Thus, the null hypothesis was not rejected. BI score was not significantly related to EI score.

Hypothesis 4:

Is there is a relationship between age and EI as measured by the TPB Inventory for overweight African American women?

$H_0$4:: There is not a significant correlation between age and EI for overweight African American women.

$H_1$4: There is a significant correlation between age and EI for overweight African American women.

There was no significant relationship between age and EI (r=-.075, n=79, p=.511), thus the null hypothesis was not rejected. Age was not significantly related to EI score.

Hypothesis 5:

Is there a statistically significant correlation between PA as measured by the GLTQ and EI as measured by the TPB inventory for overweight African- American women?

$H_0$5: There is not a significant correlation between physical activity and EI for overweight African American women.

$H_1$5: There is a significant correlation between physical activity and EI for overweight African American women.

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There was a positive correlation between the two variables (r=.335, n=79, p=.003). This finding suggested that women who exercise more often are more likely to report higher EI, thus the null hypothesis was rejected.

Research Question 6:

For the sixth research question, I examined whether PBC, stress, or BI significantly predict EI in overweight African American women. Standard multiple regression analysis was selected to examine the unique contribution and strength of the relationship between each predictor variable and EI scores. Using the enter method in SPSS, standard multiple regression analysis allowed for evaluating all three predictor variables at once to determine which one contributed the greatest predictive power with regard to the criterion variable. Prior to testing the sixth hypothesis, I first tested the basic assumptions of regression analysis.

The proper use of multiple regression analyses requires that certain assumptions are met, which include (a) linear relationships between the predictor and dependent (criterion) variables, (b) homoscedasticity, (c) independence of errors, (d) normally distributed errors, and (e) no multicollinearity. All variables entered into the equation were quantitative and continuous. I generated a residuals scatterplot and normal probability plot to inspect for linearity and homoscedasticity. The probability plots (P-Ps) provided evidence for linear relationships between the predictor and criterion variables. I observed no major deviations from linearity as the points fell along a reasonably straight diagonal line from bottom left to top right (Pallant, 2005). A histogram revealed that a pattern of normal distribution. Homoscedasticity appeared present as I observed that at each level of the predictor variables the residuals had similar amounts of variance (Field, 2009). The Durbin-Watson test was computed to evaluate the independence of errors. The score of 1.9 is acceptable and suggested that the residual terms were independent (Field, 2009). Finally, to ensure that the predictor variables were not too highly

correlated, I generated tests for multicollinearity. First, I scanned the correlation matrix, and none of the correlations were above .80 as Field (2009) recommends. Next, the results of the collinearity statistics were examined by checking the variance inflation (VIF) and tolerance scores. The VIF values indicate whether a predictor variable has a strong linear relationship with the other predictor variables. All VIF values were low, well below the suggested cut-off of 10 (Pallant, 2005). Tolerance values were also in adequate range, suggesting no evidence for multicollinearity (Table 4).

Table 4

Regression Summary for PBC, Stress, and Body Image

Variable	B	Beta	Sig.	Tolerance	VIF	SE
PBC	.66	.66	.00	.95	1.06	.09
Stress	1.33	.19	.04	.92	1.09	.63
BI	.15	.05	.59	.94	1.06	.28

Note. DV= EI score, N=79, p=.000

A multiple linear regression was calculated to predict exercise intentions from PBC, stress, and body image. The results of the analysis indicated that this model accounted for approximately 42% of the variance in exercise intentions, R^2=.421, $F(3,75)=18.19$, $p<.001$. It was found that PBC and stress significantly predicted EI score. BI score did not significantly contribute to the prediction of EI score. Of the three

predictor variables, PBC made the strongest unique contribution to the model. Table 5 summarizes the regression model.

Table 5

Regression Model Summary[b]

Model	R	R^2	Adjusted R^2	SE of the Estimate
1	.649[a]	.421	.398	3.417

a. Predictors: (Constant), BISSCompositeMean, PBC score, PSS Mean Score
b. Dependent Variable: EI score

Summary

In Chapter 4 I reported the results related to this research study. A total of 79 African American women who reported being overweight or needing to lose weight participated in this study. A review of the results revealed several significant findings related to PBC, stress, body image, and exercise intentions in this sample. PBC was significantly related to EI, suggesting that higher PBC correlates with higher intentions to exercise. PA was also significantly related to EI score. More time spent engaging in physical activity related to higher EI score. BI, stress, and age were not significantly correlated with EI score. For the multiple regression analyses, PBC and stress were significant predictors of EI score. BI did not contribute significantly to the prediction of EI score. Chapter 5 includes a discussion of the findings from this study, the limitations,

and recommendations for future research. The final chapter concludes with a discussion regarding social change implications.

Chapter 5: Discussion, Conclusions, and Recommendations

Introduction

The purpose of this research study was to examine variables related to weight in a sample of overweight African American women. This group is affected by obesity at a higher rate than other groups, which poses an increased risk for mental and physical illness. Using the TPB as a foundation, participants were asked to report about variables, including PBC and EI. Previous research evaluating these principles has focused on the intention-behavior relationship in the study of weight loss, but there is a lack of information about the experience of African American women. Most studies have compared weight-related beliefs and behaviors of African American and Caucasian women, typically within the college realm.

In addition to honing in on PBC and EI, body image (BI) beliefs and stress levels were studied. Higher levels of body satisfaction may result in less attention paid to diet and exercise, thus being overweight might not be perceived as being problematic. Further, African American females report greater levels of stress than other women placing them at higher risk for physical and mental illness (Hawkins, 2007). Unmanaged stress can also lead to weight gain, interrupted diet adherence, and failed exercise intentions (Farag et al., 2008). Physical activity (PA) and age were included in bivariate analyses. The benefits of exercise are well-known, yet intentions to increase physical activity commonly fail. The gap found in the literature resulted in the development of the following six hypotheses.

1. Is there a significant relationship between PBC and EI?

2. Is there a significant relationship between stress and EI?
3. Is there a significant relationship between BI and EI?
4. Is there a significant relationship between age and EI?
5. Is there a significant relationship between PA and EI?
6. Does the linear combination of PBC, stress, and BI significantly predict EI?

This research study was quantitative in nature and used an online survey method to assess the behaviors and beliefs of African American women. Due to a poor response rate at the initial time of survey administration, IRB granted my request to expand data collection from Walden University's online participant pool to using a social media website. I found that both PBC and PA significantly correlated with EI. These results were expected based on previous research testing the TPB. Stress and BI did not significantly correlate with EI. Based on mixed findings in the literature, these results further demonstrate the complex relationship between stress, BI beliefs, and intentions to exercise. A regression analysis revealed that PBC and stress both significantly predict EI. These findings are discussed in detail next.

Interpretation of Findings

Being overweight is associated with increased health risks. People generally know that eating a healthy diet and engaging in regular physical activity are linked to reducing weight. Despite this knowledge, these needed lifestyle changes often do not occur. Forming and following through with intentions to exercise involves a complex combination of variables (Blanchard et al., 2003). The TPB asserts that intention is

typically the precursor to the performance of a given behavior. Intention and PBC together influence the likelihood that exercise behavior will occur. The theory posits that holding stronger perceptions or beliefs that exercise is feasible will relate to a greater readiness to perform this behavior. In this study, there was a strong positive correlation found between PBC and EI. This result is consistent with past studies that have reported a strong association between PBC and EI (Blanchard et al., 2008; Galea & Bray, 2006). Findings from this study are also consistent with results of a large meta-analysis conducted by Hausenblas et al. (1997) that examined the utility of TPB variables. The researchers reported a large effect size (.97) for PBC and EI, suggesting that a better commitment to engage in physical activity exists when the behavior is favorable. In a longitudinal study testing the principles of the TPB, Sheeran and Orbell (2000) found a strong correlation between PBC and EI in an undergraduate college sample.

There is strong research support for the relationship between PBC and EI. My purpose was to expand the testing of the TPB to include the experience of overweight African American women. Studies that have included African American women have focused primarily on the college population. For instance, Blanchard et al. (2008) conducted a study evaluating TPB principles among a group of African American and Caucasian college women. An interesting finding was that PBC was the significant predictor of physical activity (PA) among the African American females only, whereas behavioral intention was the strongest predictor of PA among the Caucasian females. Historically, the TPB posits that intention will be the strongest predictor of how likely exercise will occur. PBC was the strongest predictor of PA for the African American

women. This finding suggests that higher PBC is associated with greater intention-behavior consistency (Amireault, Godin, Vohl, & Perusse, 2008) and is a significant moderating variable that helps fill the intention-behavior gap that is often found in exercise behavior (Amireault et al., 2008). In other words, self-efficacy related to the adoption of exercise is influenced by factors such as available resources, abilities, and conditions that may be unique to ethnicity. A strong correlation between PBC and EI suggests that an emphasis is placed on building confidence when developing physical activity interventions for African American. Even the strongest intentions to exercise meet challenges that interfere with actual physical activity.

The finding that PBC is more significant than intention among African American women is documented in other studies of health behaviors. Hanson (1997) evaluated PBC beliefs and cigarette smoking intentions among an ethnically diverse group of teenagers. The TPB was supported for smoking intentions among the African American females, with PBC being the most significant predictor of intention to smoke. PBC was not significant for the other ethnic groups studied. Similarly, in a study of breastfeeding intentions among African American women, PBC was the most significant predictor of intention to breastfeed (Saunders-Goldson & Edwards, 2004). These studies highlight the importance of PBC in the study of health behaviors among African American women. Ashing-Giwa (1999) evaluated the utility of the TPB and its cultural relevance for African American women with breast cancer. Ashing-Giwa found there was a focus on spirituality among African American women not found among other ethnic groups. It was common for women to express spiritual beliefs that God was in control of their future,

with less perceived control over health and access to healthcare. These studies highlight the importance of identifying PBC in health interventions.

The moderating role of ethnicity in the relationship between PBC and EI should not be ignored. Blanchard et al. (2003) studied PBC and EI among a sample of college students. Although it was not an expected result, Blanchard et al. found significant gender differences within ethnic groups. For example, the African American females believed that school work interfered with EI, but the males did not hold this belief. Also, the African American females held the belief that exercise would help reduce stress and improve mood, but the males did not report this as being significant. The findings from this study not only highlight the need to explore ethnicity, but also gender interactions in the study of PBC and EI.

Exercise is one of the most effective interventions for weight loss and improved health status. The knowledge that PBC and EI influence the performance of physical activity is essential in the development of an appropriate theory-based intervention. Support for the TPB justifies the continued application of this theory, yet highlights a need for health programs to be culturally applicable.

Stress is another variable related to obesity. In this study, no significant relationship was found between stress and EI. This finding was somewhat surprising, given that higher stress levels have been correlated with weight gain, regaining lost weight, and the cessation of exercise adherence (Elfhag & Rossner, 2005). Previous research has shown that African American women drop out of weight loss programs and often fail to follow through with intentions to exercise when stress levels are high

(Walcott-McQuigg, 1995). Kim et al. (2009) found that African American women have reported decreased motivation to exercise when stress levels are high. The women in this study reported high stress compared to normative data for women on the Perceived Stress Scale. Higher stress among the participants in this sample is consistent with Hawkin's (2007) finding that African American women experience more stress compared to other ethnic groups.

Several explanations exist as to why stress did not correlate with EI in this study. First, the lack of significance could be related to the complexity of the relationship between stress and exercise. Stults-Kolehmainen and Sinha (2014) reviewed 168 articles that examined the relationship between stress and EI. They concluded that the relationship between stress and EI was complicated, due to the bi-directional relationship of the variables. In 18% of the studies reviewed, women reported exercising when they felt stress levels rise and therefore did not allow stress to interfere with formed intentions to remain active. Further, 29 of the studies reviewed reported that some stressful life events (new job, retirement, starting a new romantic relationship) were associated with increased EI and physical activity behaviors (Stults-Kolehmainen & Sinha). These findings suggest that the presence of stress does not necessarily warrant a decrease in behavioral intentions. A lack of significance between stress and EI may reflect a group that counters stress by forming behavioral intentions and following through with exercise before stress can interfere. Stults-Kolehmainen and Sinha also found that women who were physically active and exercised routinely were more likely to continue when presented with daily stress; in contrast with women who did not regularly exercise. The

majority of women in this study were “moderately” and “very” physically active as measured by the Godin Leisure Time Questionnaire. Since the participants in this study were already physically active, this suggests that stress did not interfere with their established routine.

There are other possible reasons for the lack of significance between stress and EI. The convenience sample that emerged from a participant pool and social media website may be different than the general population. Specific demographics were not collected to determine occupation status, so it is unknown how many participants were college students. As college students represent a unique population, the data may not be representative of a more diverse adult population. Further, the participants in this group voluntarily completed a survey about personal beliefs and behaviors related to their weight. Interest in health behaviors related to obesity, stress, body image, and exercise may have drawn participants to the study resulting in a sample that is not representative of African American women in general. Finally, the PSS was initially designed for paper and pencil administration. Changing the medium to an online survey format may have been a contributing factor to study results. More research to explore the relationship between stress and EI in this group is warranted to understand its complex nature in the study of obesity.

Research about body image (BI) beliefs and health intentions is mixed. In this study, no significant relationship was found between BI and EI. Participants who expressed lower BI beliefs were not more or less likely to report higher intentions to engage in physical activity. This finding is consistent with Kumanyika et al. (1992) who

found that African American women did not associate BI with exercise motivation. Roberts et al. (2006) conducted a meta-analysis and also found that African American women voice higher BI beliefs than Caucasian women, as well as a decreased need to lose weight for a thinner appearance.

The women in this study expressed low BI beliefs. Participant scores on the Body Images States Scale (BISS) were lower than the norms established for women. Poor BI beliefs are known to be related to depression and overall diminished quality of life (Carr & Friedman, 2005; Cash et al., 2004), making this an important variable to address in weight loss. Annis et al. (2004) evaluated body satisfaction in groups of average and overweight women. The overweight women reported much higher levels of body dissatisfaction than women in normal weight range. This finding is consistent with the women in this study who were overweight and voiced more negative beliefs about their body shape and appearance. Paeratakul et al. (2002) compared body image and body weight perceptions in a diverse group of adults. Significant differences existed between ethnic groups. Specifically, Caucasian women were most likely to perceive themselves as being overweight whereas African American men were least likely to perceive their weight as problematic. Paeratakul et al. noted that within-group differences were noted for the African American participants. The African American women more correctly perceived their extra body weight as being problematic than the men. Further, the African American women were the least often told to lose weight for health reasons, compared to men and individuals in other ethnic groups. Lynch and Kane (2014) assessed BI perception among overweight African American women and found significant

differences concerning cultural and medical definitions of body size. The overweight and obese women tended to not classify their weight as being problematic. This finding highlights a barrier that might exist between healthcare providers and women in conversations about the link between weight and health. Criteria for my study included women who have been told by their physician or healthcare provider they are overweight or need to lose weight. There was no formal weight or BMI calculation. A future study assessing formal body weight or body mass index would be useful to address the mixed findings in the literature regarding African American women's BI beliefs.

The BISS was used to measure BI in my study. It was designed to assess body image as a current "state" or how one feels about their body at the moment they are answering the survey questions. Accurate BI perceptions play an important role in successful weight loss (Paeratakul et al., 2002). It is unknown if the beliefs reported about BI stay consistent over time, or if the beliefs reported at the time of survey administration were influenced by answering other questions about weight, intentions, current physical activity levels and stress. Measuring BI using a different validated body image scale would be useful to see if similar results occur.

Numerous studies have pointed out ethnic differences for BI beliefs. Demarest & Allen (2000) suggested that this gap among body beliefs is narrowing. Using figure drawings, the Demarest and Allen asked African American and Caucasian women to indicate their current and ideal body shape/size. Body size dissatisfaction was similar among both groups. In Roberts et al. (2006) meta-analysis, African American women tended to report higher BI beliefs than women in other ethnic groups. However, this

difference was most pronounced among college students. As women age, BI beliefs and ethnic differences converge (Roberts et al.). A new study that controls for age might provide useful information about BI beliefs among African- American women.

Age was a variable of interest for exploratory purposes. There was no significant correlation found between age and EI. The women in this study ranged in age from 20-67, with an average age of 42 years. A limitation noted when completing the literature review in Chapter 2 was that most TPB research has used college-aged (Rivis & Sheeran, 2003) or elderly samples (Conn, Tripp-Reimer, & Maas, 2003). A few studies have reported on the general adult aged population. For instance, Matthews et al. (2014) obtained data from a large ongoing cohort study of African American and Caucasian women (*M*= 50 years) residing in the southeastern United States to study physical activity and obesity. The researchers found that overweight African American women exercised less often and engaged in more sedentary behaviors than the Caucasian women, but no significant age differences were found. Smith-Barnes et al. (2007) formed focus groups to develop a TPB questionnaire specifically for African American women. The sample size was small (*N* =37), but the researchers found no age differences related to behavioral intentions. It is possible that with a larger sample and more diverse age group, differences in EI might be significant as the sample in this study may not be representative of the general population.

Physical activity (PA) was another variable of interest in this study. There was a significant, positive relationship between PA and EI. This finding was an expected result, as those who are already physically active are likely to voice higher intentions to do so.

Nearly 80% of the women in this study reported regular exercise. This statistic is important because increasing PA is often the first intervention to reduce weight. Past research has shown that African- American women are less likely to engage in PA compared to other ethnic groups (CDC, 2014). For those who do not routinely participate in physical activity, the challenge remains to identify what impediments exist and how to address these barriers. Childcare responsibilities, unsafe neighborhoods, cost, and lack of time or access to fitness centers are primary reasons why African American women report being sedentary (Adler & Stewart, 2009; Heesch & Masse, 2004). In contrast, women who have access to neighborhood sidewalks or transportation to fitness facilities are more likely to adhere to exercise goals (Walcott-McQuigg, 2002). Social support is another important correlate of PA for African American women. Social interaction has been found to be a significant determinant of exercise (Gilette, 1998). Eyler et al. (1999) found that social support was a critical component of successful adoption of physical activity among overweight African American women. In this study, only PA levels were assessed. It would be beneficial to learn more about the strengths and barriers associated with exercise levels within this group of women. Ideas for future research are discussed in the recommendations section.

The first five hypotheses were tested to establish correlations between the variables of interest. The last research question employed standard multiple regression analysis to determine if PBC, stress, and BI predicted EI. Previous research has evaluated the principles of the TPB, but my goal was to augment the theory by addressing other weight-related variables. PBC, stress, and BI were the independent variables in this study

because of their known relationship to obesity. Multiple regression analysis allowed me to examine this set of variables and to determine each predictor's unique contribution to the model. PBC and stress significantly predicted EI, with PBC being the strongest unique predictor. This finding was an expected result based on previous TPB research that consistently links PBC with behavioral intentions (Armitage, 2005; Blanchard et al., 2008; Galea & Bray, 2006). Overweight women who intend to exercise to lose weight are more likely to engage in physical activity when they believe they can. Body image was not a significant predictor in the regression model. This finding was not surprising as BI did not significantly correlate with EI.

By itself, stress did not correlate significantly with EI. However, when the other independent variables were controlled for, stress made a significant contribution to the prediction of EI. This finding was interesting and further highlights the complex relationship between stress and weight-related variables. Responding to stress requires adaptation to challenges in the environment, both physically and psychologically (McEwen & Gianaros, 2010). Over time, stress can contribute to mental health problems and physical illness due to the toll it takes on functioning (McEwen, 2008). Exercise can act as a buffer to prevent or reduce these negative effects. For instance, an increase in physical activity typically improves stress reactivity (Jouper & Hassmen, 2009). When comparing stress levels, those who were physically active reported significantly lower perceived stress than sedentary individuals (Starkweather, 2007). Welle and Graf (2011) studied stress responses among a group of college students and found that coping strategies varied tremendously across racial groups. The African American students

sought to reduce stress by increasing PBC and actively addressing their problems. This finding is consistent with the results of my study that identified the interaction between PBC and stress. Previous studies documenting this relationship between PBC, stress, and EI were not found for comparison.

This study is the first known to look at the combination of PBC, stress, and BI to predict EI. The significance of PBC and stress contributing to the prediction of EI is a new finding. Due to higher stress reported among a group with higher obesity levels, it is paramount to understand the experience of stress among African American women. Woods-Giscombe and Lobel (2008) suggested that African American women define stress differently than other groups. Thus, a multidimensional approach to stress conceptualization is needed. For example, African American women described racism and cultural discrimination as a primary stressor (Woods-Giscombe and Lobel, 2008). Vines, Baird, McNeilly, Hertz-Piccioto, and Stevens (2006) reported that 90% of African American women surveyed had experienced passive or active racism that caused a significant amount of stress. The results from my study provide a starting point for further exploring the role of stress and PBC from a cultural perspective. Individuals with a sense of stronger perceived control related to exercise and those who are already physically active will form the strongest intentions to exercise. The addition of stress as a significant contributor to the regression model highlights the need to explore these variables more. Whereas the TPB has focused primarily on its constructs that comprise the theory, it is paramount to consider other weight-related variables as well. This dissertation project is the first study known to discuss the combination of PBC and stress

in predicting EI. This discussion highlights the importance of considering a multifaceted approach when working with overweight African American women

Study Limitations

The findings of my research study help contribute to the literature concerning the experience of overweight African American women. Of primary interest was how PBC, stress, and body image (BI) relate to exercise intentions (EI) in this group. The study was correlational in nature meaning that only predictions about the variables are possible. There was a significant correlation found between the theory-based variables PBC and EI, providing further support for the application of the TPB. However, TPB research aimed at studying the beliefs and behaviors of this defined minority group remains relatively new. Although it was beneficial to hone in on PBC and EI, this study ignored other TPB variables. Attitudes (the opinion of whether a behavior is favorable) and subjective norms to (perceived social pressure to conform) also contribute to the formation of behavioral intentions (Ajzen, 1991). The additional measurement of attitudes and subjective norm would likely contribute to a more thorough understanding of EI in this population.

Another limitation of this study involved the process of sample selection. My study utilized a convenience sample, a group of overweight African American women who voluntarily completed an online survey about weight. This group of women could have been more motivated or interested in health behaviors and held higher BI beliefs than a randomly selected sample. There is also the chance that responses were influenced by the phenomenon of social desirability. For instance, time spent exercising in a seven

day period may have been over-reported. This sample was obtained using an online participant pool and an internet social media site. Although this method allowed for a more diverse sample by location, the findings may not apply women who do not have access to the internet or may not have an account with Facebook.

This study relied on self-report responses, which results in the possibility that responses were biased, dishonest, or answered incorrectly due to misunderstanding. The criteria for participating in this study included any African American woman who has ever been told by a healthcare provider that they are overweight or need to lose weight. There was no formal weight or BMI measurement in this study. It is unknown if participants in this study were currently overweight, previously overweight and now in normal weight range, or had regained weight previously lost. Formal weight measurement or BMI assessment would be beneficial in future studies. The same limitation holds true for self-reported exercise. Due to the cross-sectional nature of this study, there was no objective assessment of time spent exercising in a seven day period. The self-reporting of physical activity level as mild, moderate, or strenuous was subjective in nature.

Recommendations

Despite the noted limitations of this study, the results of my investigation provide a starting point for the continued research of exercise intentions (EI) among overweight African American women. The application of the TPB was supported and provides a useful foundation for developing culturally-specific weight loss interventions. As noted, only PBC and EI were examined in this study. The TPB posits that intentions form from

the belief that exercise is within one's control (PBC), a favorable evaluation of exercise (attitudes), and the perception that exercise is expected (subjective norms). In this study, there was no assessment of attitudes and subjective norms. PBC was the primary TPB construct of interest. Further analysis of subjective norms and attitudes is warranted to cover the scope of the theory. Ajzen, Albarracin, and Hornik (2007) suggested that attitudes about exercise are shaped by personal beliefs and cultural experiences. Smith-Barnes et al. (2007) evaluated all TPB constructs in their study of weight loss maintenance among a group of African American women. Subjective norms included family, friends, colleagues, and doctors; and were described as having the most effect on intentions to exercise. Participants reported worries about being viewed as too thin and the management of health conditions as the most influential attitudes associated with intentions to exercise. In another study about attitudes among African American women, more than 50% reported hair care concerns as directly affecting their exercise practices (Railey, 2010). Given the time consuming and costly hairstyling practices common among the African American population, exercise and sweating are often avoided (Hall et al., 2013). Within the cultural context, it is crucial to explore a full range of factors that may be contributing to current obesity rates. Expanding my research to explore the other core aspects of planned behavior theory would likely help address the intention-behavior gap.

More research is also needed to investigate the complex nature of stress related to behavioral intentions. Stress and EI were not significantly correlated in my study, yet mixed findings in the literature warrant more attention to the role of stress in health.

Previous research has documented that higher stress leads to overeating (Block et al., 2009), interruption of exercise intentions (Stetson et al., 1997), regaining weight (Elfhag & Rossner, 2005), and an overall negative impact on exercise efforts (Walcott-McQuigg, 1995). Further, chronic stress contributes to maladaptive physical changes that weaken the body's immune system and can lead to disease (McEwen, 1998). In a pilot study by Cox et al., (2013), augmenting a weight loss program with stress management strategies resulted in better responses to obesity treatment in a sample of overweight African American women. Elfhag and Rossner (2005) found that overweight women often cope with stress by overeating and avoiding exercise, whereas those who developed alternative coping techniques lost more weight and were less likely to regain lost weight. Vines et al. (2006) suggested that African American women experience and define stress differently than other groups. The next step is to evaluate further how African American women define stress and how stress relates to intentions to exercise.

My study evaluated the experiences of a specific ethnic group. Concerning sample selection, this study could be replicated using a more diversified sample. Perhaps the use of random sampling or recruiting individuals at community centers would help elaborate current findings. Although the findings generated useful information to support the TPB, more research is needed to understand the experience of the overweight African American women. New research exploring exercise barriers for older African American adults emerged after my research study. Kosma and Cardinal (2016) found that African American women reported fear of injury, pain, and health problems as major barriers to

engaging in exercise. More culturally-sensitive research addressing barriers to physical activity is needed.

A significant relationship emerged between PBC and EI in this study. Since higher PBC associates with stronger EI, it makes sense to evaluate how to maximize positive PBC beliefs. Sniehotta, Schwarzer, Scholz, and Shulz (2005) discussed the concept of "coping planning" as a means to increase PBC to address the behavior-intention exercise gap. In their study of a group of patients in cardiac rehabilitation, the researchers found that plans/intentions to exercise were more challenging than initially assessed. To address what goes wrong when intentions to exercise fail, they recommended targeting PBC beliefs to increase success. Building confidence and developing strategies to assist women in increasing self-efficacy/PBC may help bridge the intention-behavior gap. Thus, replicating the study by Sniehotta et al. (2005) using a sample of African American women would likely be beneficial.

Body image (BI) beliefs have been a topic of interest for health researchers for decades. Whereas much research has focused on differences between ethnic groups and gender, it is important to understand the relationship between BI and weight-related behaviors. Pearson and Hall (2013) studied a group of overweight women who were involved in a cardiovascular exercise program for weight loss. They found that over the course of the treatment, BI beliefs increased the longer and more frequently women exercised. Replicating this study with a sample of overweight African American women could be beneficial. Roberts et al. (2006) reported that African American women tend to be more satisfied with their weight, with the biggest ethnic differences found within the

college years. Expanding this study to include a more age-diverse sample could provide valuable information for ethnically-appropriate interventions.

Finally, diet modification and exercise are typically the first recommendations for weight loss. The dependent variable in this study was exercise intentions. Eating habits, caloric intake, diet attempts, and food choices were ignored. A future study might utilize the addition of diet intentions to augment the current research. Mark, Riley, McDonnell, Pipe, and Reid (2014) developed and evaluated a TPB-based inventory to measure diet intentions. These researchers described the Healthy Eating Opinion Survey as a reliable and valid instrument when assessing beliefs and intentions about dieting behaviors. Incorporating this inventory into a future study could allow for the comparison of both exercise and diet intentions. In a separate study evaluating PBC and diet intentions among men and women, Armitage (2004) found a significant relationship between these two variables. Stronger PBC beliefs were related to better eating intentions and a healthier diet. The racial make-up of this sample is unknown. Therefore, it is recommended to replicate this study with African American women. Due to the strong correlation found between PBC and intentions to exercise, it could be beneficial to know how diet intentions contribute to weight.

Social Change Implications

During the proposal stage of research development, I came across two alarming facts. According to the CDC (2014), African Americans have the highest rates of obesity nationwide (47.8%), and the prevalence of obesity is much higher among women (56.6%) compared with men (37.1%). These statistics place African American women in

the highest risk category for disease and death associated with carrying excess weight. This study takes a step in addressing the weight disparity by ensuring that African American women are armed with the necessary tools and education to reduce obesity-related risks.

The incorporation of exercise is a critical piece to becoming healthier and often starts with the formation of intentions to become more physically active. Clients who seek medical of psychological treatment for weight-related problems are well aware of the general health benefits of diet and exercise. As a health psychologist and researcher, I have a responsibility to help bridge the intention-behavior gap that so commonly occurs. As such, I am committed to more than only educating individuals about the risks of a sedentary lifestyle. I plan to help clients identify what goes wrong when intentions to exercise lapse or fail. The TPB is a commonly used foundation applied to the study of health behaviors. For the application of theoretical principles to be meaningful, it is important to address ethnicity. Specifically, the strong correlation found between PBC and EI in this study justifies the importance of building perceived self-efficacy and confidence. Developing strategies to tackle obstacles when exercise is more challenging than initially assessed, for example, can contribute to more successful attempts at weight loss.

PBC appears to be an important predictor of a variety of health behaviors in African American women. Blanchard et al. (2008) found that PBC was the most significant predictor of physical activity for African American college students, more so than for any other ethnic group. Given the strong correlation in this study between PBC

and EI, a need exists to hone in on these control beliefs in hopes of forming stronger behavioral intentions. Learning more about the personal experiences and perceived beliefs about exercise can help women become more physically active and lose weight.

Understanding the role of stress in African American women will enable counselors, healthcare providers, and fitness professionals to address the risk it poses to health. For instance, higher stress levels are associated with consuming foods higher in sugar and fat content (Ng & Jeffery, 2003). Working with overweight African American women to reduce stress and replace unhealthy foods with healthier alternatives can be a meaningful piece in weight loss. Social support can help reduce stress among African American women. Welle and Graf (2011) found that African American college students coped with stress most efficiently by increasing their sense of control of the situation and building strong social network systems. Understanding how one efficaciously manages stress is a primary component to increasing tolerance to it, as well as developing programs that will work to help reduce target behaviors that interfere with intentions to lose weight.

Overall, positive social change occurs when individual and community-based weight loss programs are culturally relevant and sensitive to ethnicity and gender. The goal is to improve the health of overweight African American women by reducing obesity rates. Diet and exercise interventions need to match the experience of the client to ensure appropriateness and success.

Conclusion

Obesity is a widespread problem that affects health on a global scale. African American women face obesity rates at higher rates than any other group in the United States and thus face unique cultural challenges to losing weight. The quality of life improves when excess weight is lost. Improving the health and wellness of identified at-risk ethnic groups is possible when considering culturally-specific factors. Further theoretical exploration about the intention-behavior relationship among African American women trying to lose weight is crucial. This research identified factors related to beliefs and intentions about exercise behaviors. The next step is to build upon the current research findings to continue addressing the health of overweight African American women.

References

Adams, C. E., Greenway, F. L., & Brantley, P.J. (2011). Lifestyle factors and ghrelin: Critical review and implications for weight loss maintenance. *Obesity Reviews, 12*(5), 211-218. doi: 10.1111/j.1467-789X.2010.00776.x

Adler, N. E., & Stewart, J. (2009). Reducing obesity: Motivating action while not blaming the victim. *Milbank Quarterly, 87*, 49-70.

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*(1), 179-211. Retrieved from http://www.journals.elsevier.com/organizational-behavior-and-human-decision-processes/

Ajzen, I. (2005). *Attitudes, personality and behavior* (2nd ed.). New York, NY: McGraw-Hill.

Ajzen, I., Albarracin, D., & Hornik, (2007). *Prediction and change of health behavior: Applying the Reasoned Action research.* Mahwah, NJ: Lawrence Erlbaum Publishers.

Albarracin, D., Johnson, B. T., Fishbein, M., & Muellerleile, P. A. (2001). Theories of reasoned action and planned behavior as models of condom use: A meta-anlaysis. *Psychological Bulletin, 127*(1), 142-161. doi: 10.1037/0033-2909.127.1.142

American Psychological Association. (2008). *Stress in America.* Retrieved from http://www.apa.org/news/press/releases/2008/10/stress-in-america.pdfof

Amireault, S., Godin, G., Vohl, M. C., & Perusse, L. (2008). Moderators of the intention-behavior and perceived behavioral control-behavior relationships for leisure-time

physical activity. *International Journal of Behavioral Nutrition and Physical Activity, 5* (7), 5868-5878. doi: 10.1186/1479-5868-5-7

Annis, N. M., Cash, T. F., & Hrabosky, J. I. (2004). Body image and psychosocial differences among stable average weight, currently overweight, and formerly overweight women: the role of stigmatizing experiences. *Body Image, 1*(2), 155-167. doi:10.1016/j.bodyim.2003.12.001

Appel, S. J., Harrell, J. S., & Deng, S. (2002). Racial and socioeconomic differences in risk factors for cardiovascular disease among southern rural women. *Nursing Research, 51*(3), 140-147. Retrieved from http://journals.lww.com/nursingresearchonline/pages/articleviewer.aspx?year=2002&issue=05000&article=00002&type=abstract.

Arab, L., Carriquiry, A., Steck-Scott, S., & Gaudet, M. M. (2003). Ethnic differences in the nutrient intake adequacy of premenopausal US women: Results from the Third National Health Examination Survey. *Journal of the American Dietetic Association, 103*(8), 1008-1014. Retrieved from http://www.elsevier.com/journals/journal-of-the-american-dietetic-association/0002-8223

Armitage, C. J. (2005). Can the theory of planned behavior predict the maintenance of physical activity? *Health Psychology, 24*(3), 235-245. doi: 10.1037/0278-6133.24.3.235

Armitage, C. J., & Christian, J. (2006). *Planned behavior: The relationship between human thought and action.* New Brunswick, NJ: Transaction Publishers.

Armitage, C. & Conner, M. (1999). The theory of planned behavior: Assessment of predictive validity and 'perceived control'. *British Journal of Social Psychology, 38*(1), 35-54. Retrieved from http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)2044-8309

Armitage, C. & Conner, M. (2001). Efficacy of the theory of planned behavior: A meta-analytic review. *British Journal of Social Psychology, 40,* 471-499.

Ashing-Giwa, K. (1999). Health behavior change models and their socio-cultural relevance for breast cancer screening in African American Women. *Women & Health, 28*(4), 53-71. doi: 10.1300/J013v28n04_04

Babbie, E (2010). *The practice of social research* (12th ed.). Belmont, CA: Wadsworth Publishing.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84*(2), 191-215. doi: 10.1037/0033-295X.84.2.191

Bandura, A. (1997). *Self-efficacy: The exercise of control.* New York: W.H. Freeman.

Balfour, L., White, D. R., Schriffin, A., Dougherty, G., & Dufresne, J. (1993). Dietary disinhibition, perceived stress, and glucose control in young, Type 1 diabetes women. *Health Psychology, 12,* 33-38. doi: 10.1037/0278-6133.12.1.33

Bartfield, J. K., Ojehomon, N., Huskey, K. W., Davis, R. B., & Wee, C. C. (2010). Preferences and self-efficacy for diet modification among primary care patients. *Obesity, 18*(2), 430-432. Retrieved from http://onlinelibrary.wiley.com/journal/10.1002/(ISSN)1930-739X

Baturka, N., Hornsby, P. P., & Schorling, J. B. (2000). Clinical implications of body

image among rural African American women. *Journal of General Internal Medicine, 15*(4), 235-241. doi: http://dx.doi.org/10.1111/j.1525-1497.2000.06479.x

Bidulescu, A., Din-Dzietham, R., Coverson, D. L., Chen, Z., Meng, Y. X., Buxbaum, S. G.,…Welch, V.L. (2010). Interaction of sleep quality and psychological stress on obesity in African Americans: The cardiovascular Health Epidemiology Study (CHES), *BMC Public Health, 10,* 581-591. Retrieved from http://www.biomedcentral.com/bmcpublichealth

Blaine, B. (2008). Does depression cause obesity?:A meta-analysis of longitudinal studies of depression and weight control. *Journal of Health Psychology, 13,* 1190-1197. doi:10.1177/1359105308095977

Blanchard, C. M., Courneya, K. S., Rodgers, W. M., Daub, B., & Knapik, G. (2002). Determinants of exercise intention and behavior during and after phase 2 cardiac rehabilitation: An application of the theory of planned behavior. *Rehabilitation Psychology, 47(*3), 308-323. doi: 10.1037/0090-5550.47.3.308

Blanchard, C. M., Rhodes, R. E., Nehl, E., Fisher, J., Sparling, P., & Courneya, K. S. (2003). Ethnicity and the theory of planned behavior in the exercise domain. American *Journal of Health Behavior, 6,* 579-591. Retrieved from http://www.ajhb.org/

Blanchard, C. M., Fisher, J., Sparling, P., Nehl, E., Rhodes, R., Courneya, K., …Baker, F. (2008). Understanding physical activity behavior in African American and Caucasian college students: An application of the theory of planned behavior.

Journal of American College Health, 56(4), 341-346. Retrieved from http://www.acha.org/Publications/JACH.cfm

Bjorntorp, P. (2001). Do stress reactions cause abdominal obesity and comorbidities? *Obesity Reviews, 2*(2), 73-86. doi: 10.1046/j.1467-789X.2001.00027.x

Blixen, C. E., Singh, A., & Thacker, H. (2006). Values and beliefs about obesity and weight reduction among African American and Caucasian women. *Journal of Transcultural Nursing, 17*(1), 290-297. doi: 10.1177/1043659606288375

Block, J. P., He, Y., Zaslavsky, A. M., Ding, L., & Ayanian, J. Z. (2009). Psychosocial stress and change in weight in among US adults. *American Journal of Epidemiology, 170(*2), 181-192. doi: 10.1093/aje/kwp104

Blue, C. L. (1995). The predictive capacity of the theory of reasoned action and the theory of planned behavior in exercise research: An integrated literature review. *Research in Nursing Health and Health, 18*(1), 105-121. Retrieved from http://onlinelibrary.wiley.com/journal/10.1002/(ISSN)1098-240X

Blue, C. L. (2007). Does the theory of planned behavior identify diabetes-related cognitions for intention to be physically active and eat a healthy diet*? Public Health Nursing, 24*(2), 141-150. doi: 10.1111/j.1525-1446.2007.00618.x

Brannon, L., & Feist, J. (2007). *Health Psychology: An introduction to behavior and health* (6th ed.). Belmont, CA: Wadsworth Publishing.

Brickell, T. A., Chatzisarantis, N. L., & Pretty, G. M. (2006). Using past behavior and spontaneous implementation intentions to enhance the utility of the theory of planned behavior in predicting exercise. *British Journal of Health Psychology,*

11(2), 249-262. doi: 10.1348/135910705X52471

Burke, G. L., Savage, P. J., Manolio, T. A., Sprafka, J. M., Wagenknecht, L. E., Sydney, S., et al., (1992). Correlates of obesity in young black and white women: The CARDIA study. *American Journal of Public Health, 82*(12), 1621-1625. Retrieved from http://ajph.aphapublications.org/

Burkholder, G. J. (n.d.). *The absolute essentials of sample size analysis*. [PowerPoint slides]. Retrieved from Walden University's website: https://class.waldenu.edu/bbcswebdav/institution/USW1/201430_01/PH_PSYC/PSYC_9000/Course%20Info/Course%20Info/embedded/The_Absolute_Essentials_of_Sample_Size_Analysis.ppt

Carr, D., & Friedman, M. A. (2005). Is obesity stigmatizing?: Body weight, perceived discrimination, and psychological well-being in the United States. *Journal of Health & Social Behavior, 46*(3), 244-259. Retrieved from http://hsb.sagepub.com/

Carraca, E. V., Silva, M. N., Markland, D., Vieira, P. N., Minderico, C.S., Sardinha, L. B., & Teixeira, P. J. (2011). Body image change and improved eating self-regulation in a weight management intervention in women. *International Journal of Behavioral Nutrition and Physical Activity, 8*, 2-11.

Cash, T. F., Fleming, E. C., Alindogan, J., Steadman, L., & Whitehead, A. (2002). Beyond body image as a trait: The development and validation of the Body Image States Scale. *Eating Disorders, 10*(1), 103-113. doi: 10.1080/10640260290081678

Cash, T. F., Phillips, K. A., Santos, M. T., & Hrabosky, J. I. (2004). Measuring "negative body image": Validation of the Body Image Disturbance Questionnaire in a nonclinical population. *Body Image, 1*(4), 363-372.

Centers for Disease Control and Prevention (2014). *Overweight and Obesity*. Author. Retrieved from. http://www.cdc.gov/obesity/data/adult.html

Chang, M. W., Brown, R. L., Baumann, L. J., & Nitzke, S. A. (2008). Self-efficacy and dietary fat reduction behaviors in obese African-African and white mothers. *Obesity, 16*(5), 992-1001. doi: 10.1038/oby.2008.20

Cohen, J. (1992). A power primer. *Psychological Bulletin, 112*(1), 155-159. doi: 10.1037/0033-2909.112.1.155

Cohen, S. (1994). *Perceived Stress Scale.* Retrieved from http://updates.wcupa.edu/_academics/healthsciences/stressreductioncenter/documents/perceived_stress_scale.pdf.

Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. *Journal of Health & Social Behavior, 24*(1), 385-396. Retrieved from http://hsb.sagepub.com/

Cohen, S., & Williamson, G. (1988*). Perceived stress in a probability sample of the United States.* In S. Spacapam & S. Oskamp (Eds.), The social psychology of health: Claremont Symposium on applied social psychology. Newbury Park, CA: Sage.

Conn, V. S., Tripp-Reimer, T., Maas, M. L.(2003). Older women and exercise: Theory of Planned Behavior beliefs. *Public Health Nursing, 20*(2), 153-163.

doi:10.1046/j.1525-1446.2003.20209.x

Conner, M., Norman, P., & Bell, R. (2002). The theory of planned behavior and healthy eating. *Health Psychology, 21*(2), 194-201. doi: 10.1037/0278-6133.21.2.194

Conner, M., Povey, R., Sparks, P., James, R., & Shepherd, R. (2003). Moderating role of attitudinal ambivalence within the theory of planned behavior. *British Journal of Social Psychology, 42*(1), 75-95. Retrieved from http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)2044-8309

Conner, M., Sheeran, P., Norman, P., & Armitage, C. (2000). Temporal stability as a moderator of relationships in the Theory of Planned Behavior. *British Journal of Social Psychology, 39*(1), 469-493. Retrieved from http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)2044-8309

Cox, T. L., Krukowski, R., Love, S. J., Eddings, K., DiCarlo, M., Chang, J. Y., …West, D.S. (2013). Stress management-augmented behavioral weight loss intervention for African American women: A pilot, randomized controlled trial. *Health, Education, and Behavior, 40*(1), 78-87 doi: 10.1177/1090198112439411

Creswell, J. W. (2009). Research design: Qualitative, quantitative, and mixed methods approaches (3rd ed.). Sage Publishing: Los Angeles, CA.

Crosby, R. A., DiClemente, R. J., & Salazar, L. F. (2006). *Research methods in health promotion.* Jossey-Bass, San Francisco, CA.

Davis, N. L., Clance, P. R., & Gailis, A. T. (1999). Treatment approaches for obese and overweight African American women: A consideration of cultural dimensions. *Psychotherapy: Theory, Research, Practicing, Training, 36*(1), 27-35. doi:

10.1037/h0087643

DeBruin, M., Sheeran, P., Kok, G., Hiemstra, A., Prins, J. M., Hospers, H.J., …van Breukelen, G. (2012). Self-regulatory processes mediate the intention-behavior relation for adherence and exercise behaviors. *Health Psychology, 31*(6), 695-703. Retrieved from https://www.researchgate.net/publication/221888401_Self-Regulatory_Processes_Mediate_the_Intention-Behavior_Relation_for_Adherence_and_Exercise_Behaviors

Demarest, J., & Allen, R. (2000). Body image: Gender, ethnic, and age differences. *The Journal of Social Psychology, 140*(4), 465-472. doi: 10.1080/00224540009600485

Dibonaventura, M. D., & Chapman, G. B. (2008). The effect of barrier underestimation on weight management and exercise change. *Psychology, Health, & Medicine, 1*3, 111-112. doi: 10.1080/13548500701426711

Doll, J., & Ajzen, I. (1992). Accessibility and stability of predictors in the theory of planned behavior. *Journal of Personality and Social Psychology, 63*(5), 754-765. doi: 10.1037/0022-3514.63.5.754

Drury, C. A. (2002). Exploring the association between body weight, stigma of obesity, and health care avoidance. *Journal of the Academy of Nurse Practitioners, 14*(12), 554-561. doi: 10.1111/j.1745-7599.2002.tb00089.x

Dunn, C. L., Hannan, P. J., Jeffery, R. W., Sherwood, N. E., Pronk, N. P., & Boyle, R. (2006). The comparative and cumulative effects of a dietary restriction and exercise on weight loss. *International Journal of Obesity, 30*(1), 112-121. doi:

10.1038/sj.ijo.0803046

Dutton, G. R., Napolitano, M. A., Whiteley, J. A., & Marcus, B. H. (2008). Is physical activity a gateway behavior for diet?: Findings from a physical activity trial. *Preventive Medicine, 46*(3), 216-221. Retrieved from http://www.journals.elsevier.com/preventive-medicine/

Elfhag, K., & Rossner, S. (2005). Who succeeds in maintaining weight loss? A conceptual review of factors associated with weight loss maintenance and weight regain. *Obesity Reviews, 6*(1), 67-85. doi: 10.1111/j.1467-789X.2005.00170.x

Epel, E., Lapidus, R., McEwen, B., & Brownell, K. (2001). Stress may add bite to appetite in women: A laboratory story of stress-induced cortisol and eating behavior. *Psychoneuroendocrinology, 26*(1), 37-49. Retrieved from http://www.journals.elsevier.com/psychoneuroendocrinology/

Eyler, A. E., Matson-Koffman, D., Rohm-Young, D., Wilcox, S., Wilbur, J., Thompson, J.,…Evenson, K. R. (2003). Quantitative study of correlates of physical activity in women from diverse racial groups. The Women's Cardiovascular Health Network Project summary and conclusions. *American Journal of Preventive Medicine, 25*(3S1), 93-103. Retrieved from http://www.journals.elsevier.com/american-journal-of-preventive-medicine/

Eyler, A.E., Brownson, R. C., Donatelle, R. J., King, A. C., Brown, D., & Sallis, J. (1999). Physical activity social support and middle-and older-aged minority women: results from a US survey. *Social Science & Medicine, 49,* 781-789.

Farag, N. H, Moore, W. E., Lovallo, W. R., Mills, P. J., Khandrika, S., & Eichner, J. E.

(2008). Hypothalamic-Pituitary-Adrenal Axis function: Relative contributions of perceived stress and obesity in women. *Journal of Women's Health, 17*(10), 1647-1655. doi: 10.1089/jwh.2008.0866

Field, A. (2009). Discovering Statistics Using SPSS (3rd ed.). Thousand Oaks, CA: Sage.

Finkelstein, E. A., Trogdon, J. G., Cohen, J. W., & Dietz, W. (2009). Annual medical spending attributable to obesity: Payer and service-specific estimates. *Health Affairs, 28*(5), 822-831. doi: 10.1377/hlthaff.28.5.w822

Fitzgibbon, M. L., Stolley, M., Schiffer, L., Sharp, L., Singh, V., Van Horn, L, & Dyer, A. (2008). Obesity Reduction Black Intervention Trial (ORBIT): Design and baseline characteristics. *Journal of Women's Health, 17*(7), 1099-1110. doi:10.1089/jwh.2007.0614

Flynn, K. J., & Fitzgibbon, M. (1998). Body images and obesity risk among Black females: A review of the literature. *Annals of Behavioral Medicine, 20*(1), 13-24. doi: 10.1007/BF02893804

Folkman, S., Lazarus, R. S., Dunkel-Schetter, C., DeLongis, A., & Gruen, R. J. (1986). Dynamics of a stressful encounter: Cognitive appraisal, coping, and encounter outcomes. *Journal of Personality and Social Psychology, 50*(5), 992-1003. doi: 10.1037/0022-3514.50.5.992

Fontaine, K. R., Faith, M. S., Allison, D. B., & Cheskin, L. J. (1998). Body weight and health care among women in the general population. *Archives of Family Medicine, 7,* 381-384. Retrieved from http://www.clockss.org/clockss/Archives_of_Family_Medicine

Fox, K. R., & Hillsdon, M. (2007). Physical activity and obesity. *Obesity Reviews, 8*(S1), 115-121. doi: 10.1111/j.1467-789X.2007.00329.x

Galea, M. N., & Bray, S. R. (2006). Predicting walking intentions and exercise in individuals with intermittent claudication: An application of the theory of planned behavior. *Rehabilitation Psychology, 51*(4), 299-305. doi: 10.1037/0090-5550.51.4.299

Gariepy, G., Nitka, D., & Schmitz, N. (2010). The association between obesity and anxiety orders in the population: a systematic review and meta-analysis. *International Journal of Obesity, 34*(3), 407-419. doi: http://dx.doi.org/10.1038/ijo.2009.252

Gilette, P., 1988. Self-reported factors influencing exercise adherence in overweight women. *Nursing Research 37,* 25-29.

Gillman, M. W., Pinto, B. M., Tennstedt, S., Glanz, S., Marcus, B., & Friedman, R. H. (2001). Relationships of physical activity and dietary behaviors among adults. *Preventive Medicine, 32*(3), 295-301.Retrieved from http://www.sciencedirect.com/science/article/pii/S0091743507005117

Godin, G. & Shephard, R. J. (1997). Godin Leisure-Time Exercise Questionnaire. *Medicine and Science in Sports and Exercise, 29*, S36-S38.

Godin, G. & Shephard, R. J. (1985). A simple method to assess exercise behavior in the community. *Canadian Journal of Applied Sport Sciences, 10*(1), 141-146. Retrieved from https://sciencescape.org/journal/11191

Godin, G. (1993). The theories of reasoned action and planned behavior: Overview of

findings, emerging research problems and usefulness for exercise promotion. *Journal of Applied Sport Psychology, 5*(1), 141-157. Retrieved from http://www.tandfonline.com/toc/uasp20/current#.UlBiuIakp5c

Gravateer, F. J., & Wallnau, L. B. (2009). *Statistics for the behavioral sciences* (8th ed.). Belmont, CA: Thomson Wadsworth.

Greenwood, D. N., & Dal Cin, S. (2012). Ethnicity and body consciousness: Black and White American women's negotiation of media ideals and others' approval. *Psychology of Popular Media Culture, 1*(4), 220-235.

Grier, S. A., & Kumanyika, S. K. (2008). The context for choice: Health implications of targeted food and beverage marketing to African Americans. *American Journal of Public Health, 98(*9), 1616-1629. doi: 10.2105/AJPH.2007.115626

Grunberg, N.E., & Straub, R.O. (1992). The role of gender and taste class in the effects of stress on eating. *Health Psychology, 11*(2), 97-100.

Hagger, M. S., Chatzisarantis, N. L., & Biddle, S. J. (2002). A meta-analytic review of the theories of reasoned action and planned behavior in physical activity: Predictive validity and the contribution of additional variables. *Journal of Sport and Exercise Psychology, 2*(1), 3-32.

Hall, R.R., Francis, S., Whitt-Glover, M., Loftin-Bell, K., Swett, K., & McMichael, A. J. (2013). Hair care practices as a barrier to physical activity in African American women. *Journal of the American Medical Association Dermatology, 149*(3), 310-314. doi:10.1001/jamadermatol.2013.1946

Hanson, M. J. (1997). The theory of planned behavior applied to cigarette smoking in

African American, Puerto Rican, and non-Hispanic white teenage females. *Nursing Research, 46*(3), 155-162. Retrieved from http://journals.lww.com/nursingresearchonline/Pages/default.aspx

Harris, M. B., Walters, L. C., & Waschull, S. (1991). Gender and ethnic differences in obesity-related behaviors and attitudes in a college sample. *Journal of Applied Social Psychology, 21*, 1545– 1566. doi: 10.1111/j.1559-1816.1991.tb00487.x

Hausenblas, H. A., Carron, A. V., & Mack, D. E. (1997). Application of the theories of reasoned action and planned behavior to exercise behavior: A meta-analysis. *Journal of Sports and Exercise Psychology, 19*(1), 36-51. doi: 10.1037/0278-6133.24.3.235

Hawkins, B. (2007). African American women and obesity: From explanations to prevention. *Journal of African American Studies, 11*(1), 79-93. doi: 10.1007/s12111-007-9014-5

Hay, E. L., & Diehl, M. (2010). Reactivity to daily stressors in adulthood: The importance of stressor type in characterizing risk factors. *Psychology of Aging, 25,* 118-131.

Hebel, M. R., & Xu, J. (2003). Weighing the care: Patients' perceptions of physician care as a function of gender and weight. *International Journal of Obesity and Related Metabolic Disorders, 27*(2), 269-275. Retrieved from http://www.nature.com/ijo/index.html

Heesch, K. C., & Masse, L. C. (2004). Lack of time for physical activity: Perception or reality for African American and Hispanic Women? *Women and Health, 39*(3),

45-62. doi: 10.1300/J013v39n03_04

Jefferson, D. L., & Stake, J. E. (2009). Appearance self-attitudes of African American and European American women: Media comparisons and internalization of beauty ideals. *Psychology of Women Quarterly, 33*(4), 396-409. doi: 10.1111/j.1471-6402.2009.01517.x

Jouper, J., & Hassmen, P. (2009). Exercise intention, age, and stress predict increased qigong exercise adherence. *Journal of Bodywork and Movement Therapies, 13*(2), 205-211.

Keele-Smith, R., & Leon, T. (2003). Evaluation of individually tailored interventions on exercise adherence. *Western Journal of Nursing Research, 25*(6), 623-640. doi:10.1177/0193945903255404

Keller, A., Litzelman, K., Wisk, L. E., Maddox, T., Cheng, E. R., Creswell, P. D., & Witt, W. P. (2012). Does the perception that stress affects health matter? The association with health and mortality. *Health Psychology, 31*(5), 677-684. doi: 10.1037/a0026743

Kim, K. H., Bursac, Z., DiLillo, V., White, D. B., & West, D. S. (2009). Stress, race, and body weight. *Health Psychology, 28*(1), 131-135. doi: 10.1037/a0012648

Kiviniemi, M. T., Voss-Humke, A. M., & Siefert, A. L. (2007). How do I feel about the behavior? The interplay of affective associations with behaviors and cognitive beliefs as influences on physical activity behavior. *Health Psychology, 26*(2), 152-158. doi: 10.1037/0278-6133.26.2.152

Kolasa, K. M., Collier, D. N., & Cable, K. (2010). Weight loss strategies that really work.

The Journal of Family Practice, 59(7), 378-385. Retrieved from http://www.jfponline.com/

Kolotkin, R. I., Meter, K., & Williams, G. R. (2001). Quality of life and obesity. *Obesity Reviews, 2(*4), 219-229. Retrieved from http://onlinelibrary.wiley.com/journal/10.1111/(ISSN)1467-789X

Kopelman, P. (2007). Health risks associated with obesity. *Obesity Reviews, 8*(S1), 13-17. doi: 10.1111/j.1467-789X.2007.00311.x

Kosma, M., & Cardinal, B. (2016). Theory-based physical activity beliefs by race and activity levels among older adults. *Ethnicity & Health, 21*(2), 181-195.doi: 10.1080/13557858.2015.1047741

Kudielka, B. M., & Kirschbaum, C. (2005). Sex differences in HPA axis responses to stress: a review. *Biological Psychology, 69*(1), 113-132. doi: 10.1016/j.biopsycho.2004.11.009

Kumanyika, S. K., Morssink, C., & Agurs, T. (1992). Models for dietary and weight change in African American women: Identifying cultural components. *Ethnicity & Disease, 2*(2), 166-175. Retrieved from http://www.researchgate.net/journal/1049-510X_Ethnicity_disease

Kumanyika, S. K., Whitt-Glover, M. C., Gary, T. L., Prewitt, T. E., Odoms-Young, A. M., Banks-Wallace, J. (2007). Expanding the obesity research paradigm to reach African-American communities. *Preventing Chronic Disease, 4*(4). Retrieved from http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2099277/

Lazarus, R. A (2011). Theory-based stress management. *Psychological Inquiry, 1*(1), 3-

13. Retrieved from http://www.tandfonline.com/loi/hpli20#.U39cHPldUzc

Lazarus, R. A., Deese, J., & Osler, S. F. (1952). The effects of psychological stress upon performance. *Psychological Bulletin, 49*(4), 293-317. doi: 10.1037/h0061145

Lewis, T., Everson-Rose, S., Sternfeld, B., Karavolos, K., Wesley, D., & Powell, L.(2005). Race, education, and weight change in a biracial sample of women at midlife. *Archives of Internal Medicine, 165*(5), 545-551. doi:10.1001/archinte.165.5.545

Linde, J. A., Rothman, A. J., Baldwin, A. S., & Jeffery, R. W. (2006). The impact of self-efficacy on behavior change and weight change among overweight participants in a weight loss trial. *Health Psychology, 25*(3), 282-291. doi: 10.1037/0278-6133.25.3.282

Lutes, L. D., Winett, R. A., Barger, S. D., Wojcik, J. R., Herbert, W. G., Nickols-Richardson, S. M., & Anderson, E. S. (2008). Small changes in nutrition and physical activity promote weight loss and maintenance: 3 month evidence from the ASPIRE randomized trial. *Annals of Behavioral Medicine, 35*(3), 351-357. doi: 10.1007/s12160-008-9033-z

Lynch, C. P., McTigue, K. M., Bost, J. E., Tinker, L. F., Vitolins, M., Adams-Campbell, L., …Kuller, L. H. (2010). Excess weight and physical health-related quality of life in postmonopausal women of diverse racial/ethnic backgrounds. *Journal of Women's Health, 19(*8), 1449-1458. Retrieved from http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2941408/

Lynch, E.B., & Kane, J. (2014). Body size perception among African American women.

Journal of Nutrition Education and Behavior, 46(5), 412-417.

Mark, A. E., Riley, D. L., McDonnell, L. A., Pipe, A. L., & Reid, R. D. (2014). Healthy Eating Opinion Survey for individuals at risk for cardiovascular disease. *Health Psychology, 33*(8), 904-911.

Mata, J., Silva, M. N., Vieira, P. N., Carraca, E. V., Andrade, A. M., Coutinho, S. R.,…Teixeira, P. J. (2009). Motivational "spill-over" during weight control: Increased self-determination and exercise intrinsic motivation predict eating self-regulation. *Health Psychology, 28*(6), 709-716. doi: 10.1037/a0016764

Matthews, C. E., Cohen, S. E., Fowke, J. H., Han, X., Xiao, Q., Buchowski, M. S., …Blot, W. J. (2014). Physical activity, sedentary behavior, and cause-specific mortality in Black and White adults in the Southern Community Cohort Study. American *Journal of Epidemiology, 180*(4), 394-405.

McEwen, B. S. (1998). Protective and damaging effects of stress mediators. *New England Journal of Medicine, 338*(3), 171-179. Retrieved from http://www.nejm.org/

McEwen, B. S., & Gianaros, P. J. (2010). Central role of the brain in stress and adaptation: Links to socioeconomic status, health, and disease. *Annals of the New York Academy of Sciences, 11*86(1), 190-222. doi: 10.1111/j.1749-6632.2009.05331.x

McTigue, K. M., Larson, J. C., Valoski, A., Burke, G., Kotchen, J., Lewis, C. E.,…Kuller, L. (2006). Mortality and cardiac and vascular outcomes in extremely

obese women. *Journal of the American Medical Association, 270*(18), 2207-2212. doi: doi:10.1001/jama.296.1.79.

Miller, G. E., Chen, E., & Zhou, E. S. (2007). If it goes up, must it come down? Chronic stress and the hypothalamic-pituitary-adrenocortical axis in humans. *Psychological Bulletin, 133*(1), 25-45. doi:10.1037/0033-2909.133.1.25

Miller, W. C., Koceja, D. M., & Hamilton, E. J. (1997). A meta-analysis of the past 25 years of weight loss research using diet, exercise, or diet plus exercise intervention. *International Journal of Obesity and Related Metabolic Disorders, 21(*10), 941-947. Retrieved from http://www.nature.com/ijo/index.html

Murgatroyd, P. R., Goldberg, G. R., Leahy, F. E., Gilsenan, M. B., & Prentice, A. M. (1999). Effects of inactivity and diet composition on human energy balance. *International Journal of Obesity and Related Metabolic Disorders, 23*(12), 1269-1276. Retrieved from http://www.nature.com/ijo/index.html

National Institute of Diabetes and Digestive and Kidney Diseases (2013). *Statistics related to overweight and obesity*. Retrieved from http://www.win.niddk.nih.gov/statistics/index.htm#overweight

Needham, B. L., Epel, E. S., Adler, N. E., & Kiefe, C. (2010). Trajectories of change in obesity and symptoms in depression: the CARDIA study. *American Journal of Public Health, 100*(6), 1040-1046. doi: 10.2105/AJPH.2009.172809

Ng, D. M., & Jeffery, R. W. (2003). Relationships between perceived stress and health behaviors in a sample of working adults. *Health Psychology, 22*(6), 638-642. doi: 10.1037/0278-6133.22.6.638

Nies, M. A., Vollman, M., & Cook, T. (1999). African American women's experiences with physical activity in their daily lives. *Public Health Nursing, 16*(1), 23-31. doi:10.1046/j.1525-1446.1999.00023.x

Nordgren, L. F., van der Pligt, J., & van Harraveld, F. (2008). The instability of health cognitions: Visceral states influence self-efficacy and related health beliefs. *Health Psychology, 27*(6), 722-727. doi: 10.1037/0278-6133.27.6.722

Onyike, C. U., Crum, R. M., Lee, H. B., Lyketsos, C. G., & Eaton, W. W. (2003). Is obesity associated with major depression?: Results from the Third National Health and Nutrition Examination Survey. *American Journal of Epidemiology, 158*(12), 1139-1147. Retrieved from http://aje.oxfordjournals.org/

Paeratakul, S., White, M. A., Williamson, D. A., Ryan, D. H., & Bray, G. A. (2002). Sex, race/ethnicity, socioeconomic status, and BMI in relation to self-perception of overweight. *Obesity Research, 10*(5), 345-350. doi: 10.1038/oby.2002.48

Pallant, J. (2005). *SPSS Survival Manual* (2nd ed.). New York: McGraw Hill.

Parker, S., Nichter, Mi, Nichter, Ma, Yuckovic, N., Sims, C., & Ritenbaugh, C. (1995). Body image and weight concerns among African American and White adolescent females: Differences that make a difference. *Human Organization, 54*(2), 103-114. Retrieved from https://www.sfaa.net/ho/

Patel, S. R., & Hu, F. B. (2008). Short sleep deprivation and weight gain: A systematic review. *Obesity, 16*(3), 643-653. doi: 10.1038/oby.2007.118

Patt, M. R., Yanek, L. R., Moy, T. F., & Becker, D. M. (2004). Sociodemographic, behavioral, and psychological correlates of current overweight and obesity in

older, urban African women. *Health Education & Behavior, 31*(4), 57-67. doi: 10.1177/1090198104266036

Pearson, E. S., & Hall, C. R. (2013). Examining body image and its relationship to exercise motivation: An 18 week cardiovascular program for female initiates with overweight and obesity. *Baltic Journal of Health and Physical Activity, 5*(2), 121-131.

Presseau, J., Tait, R. I., Johnston, D. W., Francis, J. J., & Sniehotta, F. F. (2013). Goal conflict and goal facilitation as predictors of daily accelerometer-assessed physical activity. *Health Psychology, 32*(12), doi:10.1037/a0029430

Pronk, N. P., Anderson, L. H., Crain, A. L., Martinson, B. C., O'Connor, P. J., Sherwood, N. E., & Whitebird, R. R. (2004). Meeting recommendations for multiple healthy lifestyle factors: Prevalence, clustering, and predictors among adolescent, adult, and senior health plan members. *American Journal of Preventive Medicine, 27(*2), 25-33. doi: 10.1016/j.amepre.2004.04.022

Ranabir, S., & Reetu, K. (2011). Stress and hormones. *Indian Journal of Endocrinology Metabolism, 15*(1), 18-22. doi: 10.4103/2230-8210.77573

Railey, M. T. (2000). Parameters of obesity in African American women. *Journal of the National Medical Association, 92*(10), 481-484.

Rejeski, W. J., Focht, B. C., Messier, S. P., Morgan, T., Pahor, M., & Penninx, B. (2002). Obese, older adults with knee osteoarthritis: Weight loss, exercise, and quality of life. *Health Psychology*, 21(5), 419-426. doi: 10.1037/0278-6133.21.5.419

Rivas, A., & Sheeran, P. (2004). *Descriptive norms as an additional predictor in the*

theory of planned behavior: A meta-analysis. In C.J. Armitage & J. Christian (Eds.). Planned behavior: The relationship between human thought and action (pp.43-62). New Brunswick, Transaction Publishing.

Roberts, A., Cash, T. F., Feingold, A., & Johnson, B. T. (2006). Are black-white differences in females' body dissatisfaction decreasing?: A meta-analytic review. *Journal of Consulting and Clinical Psychology, 74(*6), 1121-1131. doi: 10.1037/0022-006X.74.6.1121

Roberts, R. E., Deleger, S., Strawbridge, W. J., & Kaplan, G. A. (2003). Prospective association between obesity and depression: Evidence from the Alameda County Study. *International Journal of Obesity and Related Metabolic Disorders, 27*, 514-521. doi: 10.1038/sj.ijo.0802204

Rogers-Wood, N. A., & Petrie, T. A. (2010). Body dissatisfaction, ethnic identity, and disordered eating among African American women. *Journal of Counseling Psychology, 57*(2), 141-153.

Sabik, N. J., Cole, E. R., & Ward, L. M. (2010). Are all minority women equally buffered from negative body image? Intra-ethnic moderators of the buffering hypothesis. *Psychology of Women Quarterly, 34*(2), 139-151. doi: 10.1111/j.1471-6402.2010.01557x

Sanchez, D. T., & Crocker, J. (2005). How investment in gender ideals affects well-being: The role of external contingencies of self-worth. *Psychology of Women Quarterly, 29(*1), 63-77. DOI: 10.1111/j.1471-6402.2005.00169.x

Saunders-Goldson, S., & Edwards, Q. T. (2004). Factors associated with breastfeeding

intentions of African American women at military health care facilities. *Military Medicine, 169*(2), 111-116.

Schelling, S., Munsch, S., Meyer, A., Newark, P., Biedert, E., & Margraf, J. (2009). Increasing the motivation for physical activity in obese patients. *International Journal of Eating Disorders, 42*(2), 130-138. doi: 10.1002/eat.20595

Schifter, D. E., & Ajzen, I. (1985). Intention, perceived control, and weight loss: An application of the theory of planned behavior. *Journal of Personality and Social Psychology, 49*, 843-851. doi: 10.1037/0022-3514.49.3.843

Selye, H. (1953). *The General-Adaptation-Syndrome in its relationships to neurology,psychology, and psychopathology. Contributions toward medical psychology:Theory and psychodiagnostic methods* Vol 1. (pp. 234-274). New York, NY: Ronald Press Company. doi:10.1037/11419-011

Senekal, M., Steyn, N. P., Mashego, T. B., & Nel, T. H. (2001). Evaluation of body shape,eating disorders and weight management related parameters in black female students of rural and urban origins. *South African Journal of Psychology, 31*(1), 45-53.

Serdula, M. K., Mokdad, A. H., Williamson, D. F., Galuska, D. A., Mendlein, J. M., & Heath, G. W. (1999). Prevalence of attempting weight loss and strategies for controlling weight. *Journal of the American Medical Association, 282*(14), 1353-1358. doi: 10.1001/jama.282.14.1353

Shaw, H., Ramirez, L., Trost, A., Randall, P., & Stice, E. (2004). Body image and eating disturbances across ethnic groups: More similarities than differences. *Psychology*

of Addictive Behaviors, 18(1), 12-18. doi: 10.1037/0893-164X.18.1.12

Sheeran, P., & Orbell, S. (2000). Self-schemas and the theory of planned behavior. European Journal of Social Psychology, 30(4), 533-550.

Shuttlesworth, M. E., & Zotter, D. (2011). Disordered eating in African American and Caucasian women: The role of ethnic identity. *Journal of Black Studies, 42*(6), 906-922. doi: 10.1177/0021934710396368

Singh, D. (1994). Body fat distribution and perception of desirable female body shape by young black men and women. *International Journal of Eating Disorders, 16*(3), 289-294. doi: 10.1002/1098-108X(199411)16:3<289::AID-EAT2260160310>3.0.CO;2-9

Smith-Barnes, A., Goodrick, G., Pavlik, V., Markesino, J., Laws, D., & Taylor, W.(2007). Weight loss maintenance in African-American women: Focus group results and questionnaire development. *Journal of General Internal Medicine, 22*(7), 915-922. doi: 10.1007/s11606-007-0195-3

Smits, J. A., Tart, C. D., Presnell, K., Rosenfield, D., & Otto, M. W. (2010). Identifying potential barriers to physical activity adherence: Anxiety sensitivity and body mass as predictors of fear during exercise. *Cognitive Behaviour Therapy, 39*(1), 28-36. doi: 10.1080/16506070902915261

Sniehotta, F. F., Schwarzer, R., Scholz, U., & Schuz, B. (2005). Action planning and coping planning for long-term lifestyle change: theory and assessment. *European Journal of Social Psychology, 35*(4), 565-576.

Soderlund, A., Fischer, A., & Johansson, T. (2009). Physical activity, diet, and behavior

modification in the treatment of overweight and obese adults: A systematic review. *Perspectives in Public Health, 129*(3), 132-142. doi: 10.1177/1757913908094805

SPSS, Inc. (2008). SPSS 16.0 [Computer Software]. Chicago: SPSS, Inc.

Steptoe, A., Kimbell, J., & Basford, P. (1998). Exercise and the experience and appraisal of daily stressors: a naturalistic study. *Journal of Behavioral Medicine, 21(*4), 363-374. Retrieved from http://www.springer.com/medicine/journal/10865

Starkweather, A. R. (2007). The effects of exercise on perceived stress and IL-6 levels among older adults. *Biological Research for Nursing, 8*(3), 186-194.

Stetson, B. A., Rahn, J. M., Dubbert, P. M., Wilner, B. I., & Mercury, M. G. (1997). Prospective evaluation of the effects of stress on exercise adherence in community-residing women. *Health Psychology, 16*(6), 515-520. doi: 10.1037/0278-6133.22.6.638

Stults-Kolehmainen, M. A., & Sinha, R. (2014). The effects of stress on physical activity and exercise. *Journal of Sports Medicine, 44,* 81-121.

Swinburn, B., & Shelly, A. (2008). Effects of tv time and other sedentary pursuits: *International Journal of Obesity, 32(*S7), 132-136. doi:10.1038/ijo.2008.249

Symons-Downs, D., & Hausenblas, H. A. (2005). Elicitation studies and the theory of planned behavior: A systematic review of exercise beliefs. *Psychology of Sport and Exercise, 6*(1), 1-31. Retrieved from http://www.journals.elsevier.com/psychology-of-sport-and-exercise

Teixeira, P. J., Silva, M. N., Coutinho, S. R., Palmeira, A. L., Mata, J., Vieira, P.

N.,…Sardinha, L. B. (2010). Mediators of weight loss and weight loss maintenance in middle-aged women. *Obesity, 18*(4), 725-735. doi:10.1038/oby.2009.281

Thompson, J. K. (2004). The (mis)measurement of body image: Ten strategies to improve assessment for applied and research purposes. *Body Image, 1*(1), 7-14. Retrieved from www.elsevier.com/locate/bodyimage.

Turner, R. J., & Avison, W. R. (2003). Status variations in stress exposure: Implications for the interpretation of research on race, socioeconomic status, and gender. *Journal of Health & Social Behavior, 44*(4), 488-505. Retrieved from http://hsb.sagepub.com/

Tyler, D., Allan, J., & Alcozer, F. (1997). Weight loss methods used by African American and Euro-American women. *Research in Nursing and Health, 20*(5), 413-423. doi: 10.1002/(SICI)1098-240X(199710)20:5<413::AID-NUR5>3.0.CO;2-R

U.S. Census Bureau (2011). The Black population. Retrieved from http://www.census.gov/prod/cen2010/briefs/c2010br-06.pdf.

Van Poppel, M. N., Chinapaw, M. J., Mokkink, L. B., van Mechelen, W., & Terwee, C. B. (2010). Physical activity questionnaire for adults: A systematic review of measurement properties. *Journal of Sports Medicine, 40*(7), 565-600. doi: 10.2165/11531930-000000000-00000.

Vines, A. I., Baird, D. D., McNeilly, M., Hertz-Picciotto, I., Light, K. C., & Stevens, J. (2006). Social correlates of the chronic stress of perceived racism among Black

women. *Ethnicity and Disease, 16*(1), 101-107. Retrieved from http://www.ishib.org/wordpress/?page_id=39

Wadden, T. A., Brownell, K. D., & Foster, G. D. (2002). Obesity: Responding to the global epidemic. *Journal of Consulting and Clinical Psychology, 70*(3), 510-525. doi: 10.1037/0022-006X.70.3.510

Walcott, McQuigg, J. A. (1995). The relationship between stress and weight control behavior in African American women. *Journal of the National Medical Association, 87*(6), 427-432. Retrieved from http://www.nmanet.org/

Walcott-McQuigg, J. A., Shu-Pi, C., Davis, K., Stevenson, E., & Choi, A., & Wangsrikhun, S. (2002). Weight loss and weight loss maintenance in African-American women. *Journal of theNational Medical Association, 94*(8), 686-94. Retrieved from http://www.ncbi.nlm.nih.gov/pmc/journals/655/

Walsh, R. (2011). Lifestyle and mental health. *American Psychologist, 66*(7), 579-592. doi: 10.1037/a0021769

Wang, Y., & Beydoun, M. A. (2007). The obesity epidemic in the United States- Gender, age, socioeconomic, racial/ethnic, and geographical characteristics: A systematic review and meta-regression analysis. *Epidemiologic Reviews, 29(*1), 6-28. doi:10.1093/epirev/mxm007

Warziski, M. T., Sereika, S. M., Styn, M. A., Music, E., & Burke, L. E. (2008). Changes in self-efficacy and dietary adherence: The impact on weight loss in the PREFER study. *Journal of Behavioral Medicine, 31*, 81-92. doi: 10.1007/s10865-007-9135-2

Welle, P. D., & Graf, H. M. (2011). Effective lifestyle habits and coping strategies for stress tolerance among college students. *American Journal of Health Education, 42*(2), 96-105.

Williams, W. M., & Yeo, S. (2014). Is attitude a key factor to consider when designing physical activity interventions for Black Adolescent girls? A review. *Journal of Black Psychology, 1*, 1-26. doi: 10.1177/0095798414551790

Woods-Giscombe, C. L., & Lobel, M. (2008). Race and gender matter: A multidimensional approach to conceptualizing and measuring stress in African American women. *Cultural Diversity & Ethnic Minority Psychology, 14*(3), 173-182. doi: 10.1037/1099-9809.14.3.173

World Health Organization (2013). *Obesity and overweight* [Data file]. Retrieved from http://www.who.int/gho/ncd/risk_factors/overweight/en/

World Health Organization (2012). *10 facts on obesity.* Author. Retrieved from http://www.who.int/features/factfiles/obesity/en/

Wu, C. H., Heshka, S., Wang, J., Pierson, R. N., Heymsfield, S. B., Laferrere, B.,…Gallagher, D. (2007). Truncal fat in relation to total body fat: Influences of age, sex, ethnicity, and fatness. *International Journal of Obesity, 31*(9), 1384-1391. doi:10.1038/sj.ijo.0803624

Wu, T., Gao, X., Chen, M., & vanDam, R. M. (2009). Long-term effectiveness of diet-plus-exercise interventions vs. diet-only interventions for weight loss: A meta-analysis. *Obesity Reviews, 10*(3), 313-323. doi: 10.1111/j.1467789X.2008.00547.x

Yaskin, J., Toner, R. W., & Goldfarb, N. (2009). Obesity management interventions: A review of the evidence. *Population Health Management, 12*(6), 305-316. doi: 10.1089/pop.2008.0049

Appendix A: Demographic Survey

1. What is your race? Please mark all that apply.

   Hispanic, Latino, or Spanish origin

   White, Caucasian

   Black, African-American

   American-Indian or Alaskan Native

   Asian-Indian

   Japanese

   Nativee-Hawaiian

   Chinese

   Korean

   Guamanian or Chamorro

   Filipino

   Vietnamese

   Samoan

   Other Race (please print race).

2. Are you pregnant?

   Yes

   No

   I don't know

3. Have you ever been told by a physician or healthcare provider that you are overweight or need to lose weight?

   Yes No

4. What is your age?

5. What state or U.S. territory do you live in?

6. If you do not live in the U.S., where do you live?

Appendix B: Perceived Stress Scale

0 = Never 1 = Almost Never 2 = Sometimes 3 = Fairly Often 4 = Very Often

1. In the last month, how often have you been upset because of something that happened unexpectedly? __0__1__ 2__ 3__ 4

2. In the last month, how often have you felt that you were unable to control the important things in your life? __0__ 1__ 2__ 3__ 4

3. In the last month, how often have you felt nervous and "stressed"?

__0 __1__ 2__ 3__ 4

4. In the last month, how often have you felt confident about your ability to handle your personal problems? __0 __1 __2 __3 __4

5. In the last month, how often have you felt that things were going your way?

__0 __1__ 2__ 3__ 4

6. In the last month, how often have you found that you could not cope with all the things that you had to do?__ 0__ 1__ 2__ 3__ 4

7. In the last month, how often have you been able to control irritations in your life?__0 __1 __2__ 3__ 4__

8. In the last month, how often have you felt that you were on top of things?

__ 0__ 1__ 2__ 3__ 4

9. In the last month, how often have you been angered because of things that were outside of your control?__0__ 1__ 2__ 3__ 4

10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?__ 0__ 1__ 2__ 3__ 4

Appendix C: Body Image States Scale

For each of the items below, check the box beside the one statement that best describes how you feel RIGHT NOW, AT THIS VERY MOMENT. Read the items carefully to be sure the statement you choose accurately and honestly describes how you feel right now.

1. Right now I feel…
□ ***Extremely dissatisfied*** with my physical appearance
□ ***Mostly dissatisfied*** with my physical appearance
□ ***Moderately dissatisfied*** with my physical appearance
□ ***Slightly dissatisfied*** with my physical appearance
□ ***Neither dissatisfied nor satisfied*** with my physical appearance
□ ***Slightly satisfied*** with my physical appearance
□ ***Moderately satisfied*** with my physical appearance
□ ***Mostly satisfied*** with my physical appearance
□ ***Extremely satisfied*** with my physical appearance

2. Right now I feel…
□ ***Extremely satisfied*** with my body size and shape
□ ***Mostly satisfied*** with my body size and shape
□ ***Moderately satisfied*** with my body size and shape
□ ***Slightly satisfied*** with my body size and shape
□ ***Neither dissatisfied nor satisfied*** with my body size and shape
□ ***Slightly dissatisfied*** with my body size and shape
□ ***Moderately dissatisfied*** with my body size and shape
□ ***Mostly dissatisfied*** with my body size and shape
□ ***Extremely dissatisfied*** with my body size and shape

3. Right now I feel…
□ ***Extremely dissatisfied*** with my weight
□ ***Mostly dissatisfied*** with my weight
□ ***Moderately dissatisfied*** with my weight
□ ***Slightly dissatisfied*** with my weight
□ ***Neither dissatisfied nor satisfied*** with my weight
□ ***Slightly satisfied*** with my weight
□ ***Moderately satisfied*** with my weight
□ ***Mostly satisfied*** with my weight
□ ***Extremely satisfied*** with my weight

4. Right now I feel…
□ ***Extremely*** physically ***attractive***
□ ***Very*** physically ***attractive***
□ ***Moderately*** physically ***attractive***
□ ***Slightly*** physically ***attractive***
□ ***Neither attractive nor unattractive***
□ ***Slightly*** physically ***unattractive***
□ ***Moderately*** physically ***unattractive***
□ ***Very*** physically ***unattractive***
□ ***Extremely*** physically ***unattractive***

5. Right now I feel…

□ ***A great deal worse*** about my looks than I usually feel
□ ***Much worse*** about my looks than I usually feel
□ ***Somewhat worse*** about my looks than I usually feel
□ ***Just slightly worse*** about my looks than I usually feel
□ ***About the same*** about my looks as usual
□ ***Just slightly better*** about my looks than I usually feel
□ ***Somewhat better*** about my looks than I usually feel
□ ***Much better*** about my looks than I usually feel
□ ***A great deal better*** about my looks than I usually feel

6. Right now I feel that I look…

□ ***A great deal better*** than the average person looks
□ ***Much better*** than the average person looks
□ ***Somewhat better*** than the average person looks
□ ***Just slightly better*** than the average person looks
□ ***About the same*** as the average person looks
□ ***Just slightly worse*** than the average person looks
□ ***Somewhat worse*** than the average person looks
□ ***Much worse*** than the average person looks
□ ***A great deal worse*** than the average person looks
□ **Thomas F. Cash, Ph.D., 2001**

Appendix D: TPB Questionnaire

1. During the next week, how confident are you that you can accumulate 30 minutes of physical activity per day on at least 5 days?

   Completely Confident

   Unconfident

   Somewhat Unconfident

   Neither Confident or Unconfident

   Somewhat Confident

   Confident

   Completely Confident

2. During the next week, for me to accumulate 30 minutes of exercise will be:

   Extremely Difficult

   Difficult

   Somewhat Difficult

   Neither Difficult or Easy

   Somewhat Easy

   Easy

   Extremely Easy

3. During the next week, how much control do you believe you have to accumulate 30 minutes of moderate-intensity physical activity per day on at least 5 days?

   Extreme Lack of Control

   Lack of Control

   Slight Lack of Control

   Neither Control or Lack of Control

   Slight Control

   Control

Extreme Control

4. During the next week, I intend to accumulate 30 minutes of moderate-intensity physical activity per day on at least 5 days.

   Strongly Disagree

   Disagree

   Somewhat Disagree

   Neither Agree or Disagree

   Somewhat Agree

   Agree

   Strongly Agree

5. During the next week, I will try to accumulate 30 minutes of moderate-intensity physical activity per day at least five days:

   Strongly Disagree

   Disagree

   Somewhat Disagree

   Neither Agree or Disagree

   Somewhat Agree

   Agree

   Strongly Agree

6. During the next week, my goal is to accumulate 30 minutes of moderate-intensity physical activity on at least _____ days.

Appendix E: Godin Leisure Time 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 (write 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)
b) MODERATE EXERCISE
(NOT EXHAUSTING) _____
(e.g., fast walking, baseball, tennis, easy bicycling, volleyball, badminton, easy swimming, alpine skiing, popular and folk dancing)
c) MILD EXERCISE
(MINIMAL EFFORT) _____
(e.g., yoga, archery, fishing from river bank, bowling, horseshoes, golf, snow-mobiling, easy walking)

Appendix F: Permission to use Perceived Stress Scale

January 8, 2015

Heidi L Paruch
Counseling Psychology, M.S.

Dear Ms. Paruch:

This letter is in regard to your request (January 7, 2015) for permission to use the Perceived Stress Scale in your academic research study (dissertation). For not-for-profit research purposes, permission is not necessary and does not require fees. We grant you permission to use the PSS in your research project.

If you wish to reprint the scale, items from it, or a translation in a publication (including a dissertation) or online, you should also acquire permission from the American Sociological Association (ASA):

The American Sociological Association's (ASA) website is http://www.asanet.org and their copyright request page is: http://www.asanet.org/journals/reprint_permissions.cfm
There is an online form (pdf) available through a link on that page, which you may complete and submit to ASA. ASA may/may not later ask for Dr. Cohen's signature on their form; if so, you may e-mail it to me (CommonColdProject@andrew.cmu.edu).

The appropriate reference for the 10-item scale is:
Cohen, S., & Williamson, G. (1988). Perceived stress in a probability sample of the United States. In S. Spacapan & S. Oskamp (Eds.), The social psychology of health: Claremont Symposium on applied social psychology. Newbury Park, CA: Sage.

The appropriate reference for both the 4- and 14-item scales is:
Cohen, S., Kamarck, T., & Mermelstein, R. (1983). A global measure of perceived stress. Journal of Health and Social Behavior, 24, 385-396.

Scoring information is available at our website, http://www.psy.cmu.edu/~scohen/ Once there, click on 'Scales'. Thank you for your interest in the Perceived Stress Scale. I wish you the best of luck with your project.

Sincerely,

Chloe Detrick

Chloe Detrick
Assistant to Dr. Sheldon Cohen, Robert E. Doherty Professor of Psychology

Appendix G: Permission to use Body Image States Scale

Your Body Image Assessment (BISS) Inbox x

Dr. Tom Cash Jan 7 (4 days ago)
to me

Dear Heidi,

I thank you for your order of the body-image assessment(s) indicated below on your invoice.
These materials are attached as one or more viewable/printable "pdf" (Adobe Acrobat) files.
If needed, download Adobe Acrobat Reader free from http://www.adobe.com/products/acrobat/readstep.html.

Your purchase of this individual user's license grants you permission to use the materials in your research for a period of 2 years with a total of no more than 1000 administrations (e.g., 1000 participants completing the assessment on one occasion; 500 participants completing the assessment on two occasions; etc.). Materials may not be provided to other researchers for their use. Commercial use (for ultimate profit) is prohibited, as it requires a commercial license.

You may be interested in the new (2nd) edition of Cash and Smolak's (2011) "Body Image: A Handbook of Science, Practice, and Prevention." The publisher's link to this informative volume is http://www.guilford.com/cgi-bin/cartscript.cgi?page=pr/cash2.htm&sec=toc&dir=pp/ed&cart_id=792303.9996.

In July 2008, I published the second edition of "The Body Image Workbook," which presents my empirically validated cognitive-behavioral treatment program for body-image problems. For more information, visit http://www.newharbinger.com/productdetails.cfm?PC=583.

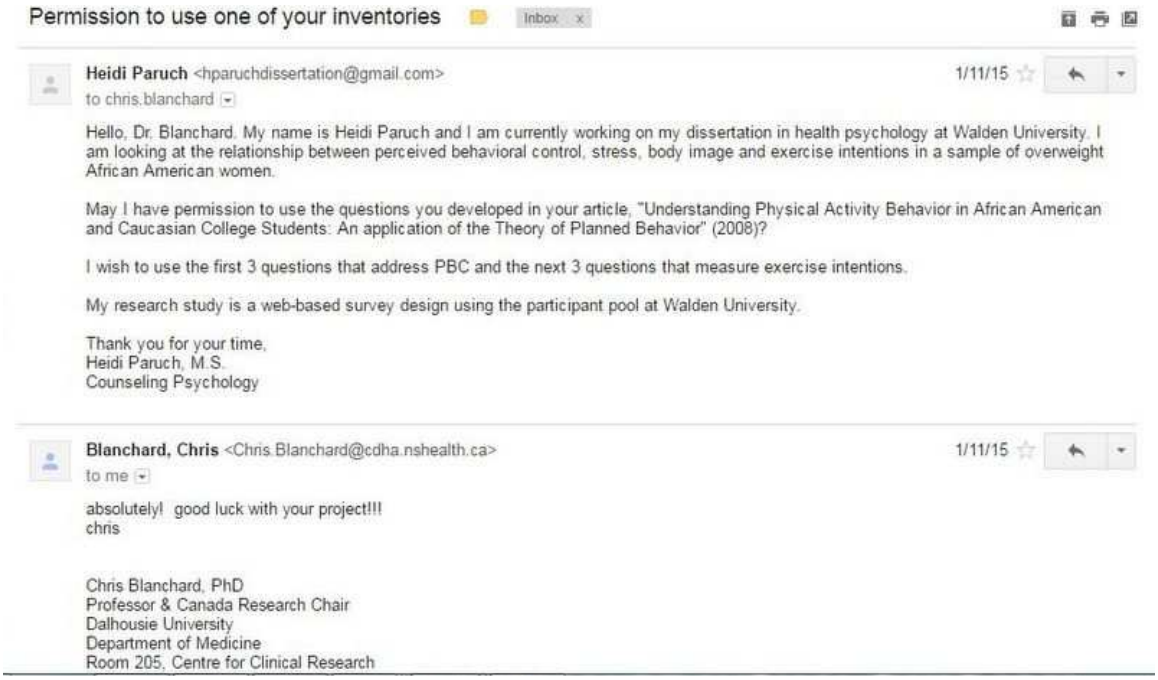
Finally, for your consideration, I'd like to make you aware of the peer-reviewed scientific journal "Body Image: An International Journal of Research." For more information, see the journal's website at http://www.elsevier.com/locate/bodyimage.

My best wishes in your body-image research.

Sincerely,

Thomas F. Cash, Ph.D.
www.body-images.com
Body-Images Research Consulting
Naples, Florida
email: body-images@comcast.net

Appendix H: Permission to Use TPB Questionnaire



Permission to use one of your inventories Inbox x

Heidi Paruch <hparuchdissertation@gmail.com> 1/11/15
to chris.blanchard

Hello, Dr. Blanchard. My name is Heidi Paruch and I am currently working on my dissertation in health psychology at Walden University. I am looking at the relationship between perceived behavioral control, stress, body image and exercise intentions in a sample of overweight African American women.

May I have permission to use the questions you developed in your article, "Understanding Physical Activity Behavior in African American and Caucasian College Students: An application of the Theory of Planned Behavior" (2008)?

I wish to use the first 3 questions that address PBC and the next 3 questions that measure exercise intentions.

My research study is a web-based survey design using the participant pool at Walden University.

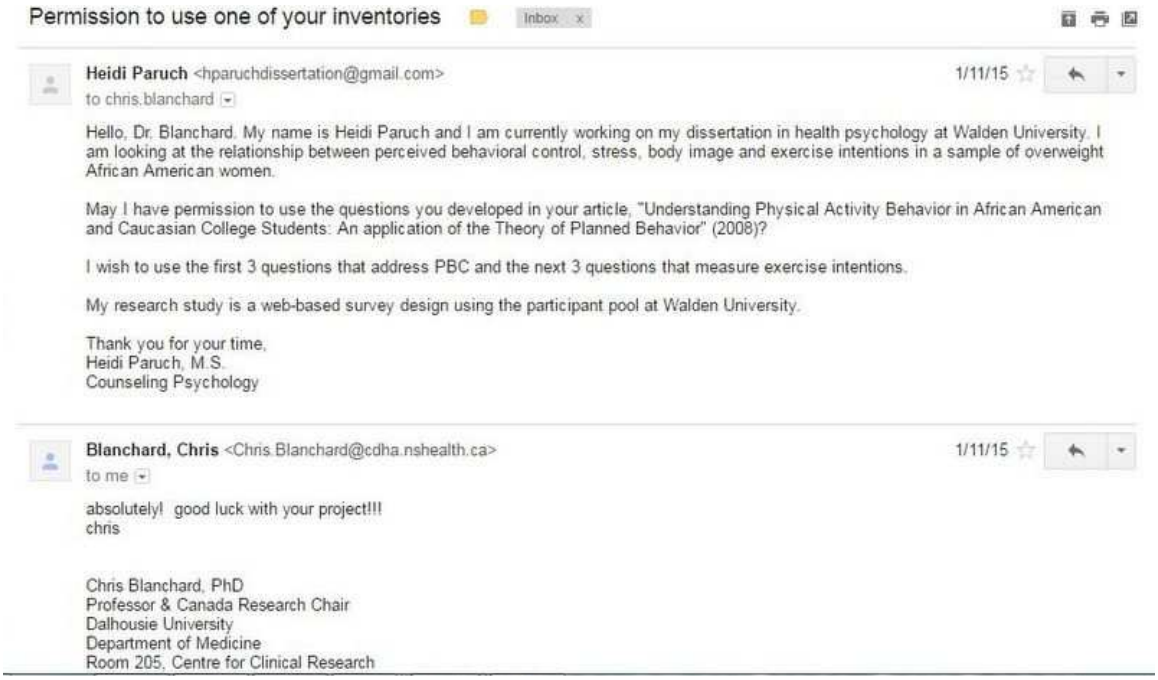
Thank you for your time,
Heidi Paruch, M.S.
Counseling Psychology

Blanchard, Chris <Chris.Blanchard@cdha.nshealth.ca> 1/11/15
to me

absolutely! good luck with your project!!!
chris

Chris Blanchard, PhD
Professor & Canada Research Chair
Dalhousie University
Department of Medicine
Room 205, Centre for Clinical Research

Appendix I: Permission to Use GLTQ



Permission to use one of your inventories Inbox x

Heidi Paruch <hparuchdissertation@gmail.com> 1/11/15

to chris.blanchard

Hello, Dr. Blanchard. My name is Heidi Paruch and I am currently working on my dissertation in health psychology at Walden University. I am looking at the relationship between perceived behavioral control, stress, body image and exercise intentions in a sample of overweight African American women.

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My research study is a web-based survey design using the participant pool at Walden University.

Thank you for your time,
Heidi Paruch, M.S.
Counseling Psychology

Blanchard, Chris <Chris.Blanchard@cdha.nshealth.ca> 1/11/15

to me

absolutely! good luck with your project!!!
chris

Chris Blanchard, PhD
Professor & Canada Research Chair
Dalhousie University
Department of Medicine
Room 205, Centre for Clinical Research