INFLUENCE OF THE BELIEF THAT GOD CONTROLS ONE'S HEALTH ON THE RELATIONSHIP BETWEEN RELIGIOSITY/SPIRITUALITY AND HEALTHY EATING BEHAVIORS AMONG BLACK MEN

By

LILLIAN BOYNTON KAYE

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To my mother, Nan Boynton, who did not leave this earth without first instilling in me a lifetime's worth of the confidence, independence, and self-efficacy needed to pursue endeavors such as this

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Lillian Boynton Kaye

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A number of major health conditions disproportionately impact Black men, including cardiovascular diseases, cancers, type 2 diabetes, and obesity. Good nutrition is an important factor in preventing and reducing these conditions. In community-based health promotion and intervention efforts targeting these health problems, religious institutions have received increased attention as implementation settings, particularly within African American/Black communities. Given this prominent trend and given the centrality of faith within mainstream African American culture, it is important to understand how religiosity may relate to African American/Black individuals' engagement in behaviors such as healthy eating.

The present study examined relationships among multiple dimensions of religiosity/spirituality, belief that God controls one's health (God locus of health control; GLHC), and engagement in healthy eating in a sample of 140 Black men. GLHC was examined as a potential moderator of the relationships between religiosity/spirituality dimensions and healthy eating.

Results revealed that healthy eating was positively associated with daily spiritual experiences and negatively associated with GLHC. Additionally, GLHC moderated the relationships between religiosity/spirituality and healthy eating for two of the four examined dimensions (religious coping and private religious practices). Specifically, healthy eating was positively associated with religious coping and private religious practices among individuals with high endorsement of GLHC; however, among individuals with low endorsement of GLHC, healthy eating was negatively associated with religious coping and not associated with private religious practices.

One interpretation of these findings is that although belief that God controls one's health may have an overall negative association with engagement in healthy eating among Black men, high religiosity may be protective against this effect. Additionally, spirituality demonstrated a more consistent positive relationship with healthy eating than did religious practices. Findings suggest that the relationship between religiosity and healthy eating is complex and inconsistent across varying dimensions of religiosity/spirituality. Given the need for effective interventions to target chronic diseases among African American/Black individuals, and given the trend of housing such interventions in faith-based institutions, it is important that program planners understand associations between religious variables and engagement in health behaviors, and consider how these variables might be used to increase the efficacy of such interventions.

CHAPTER 1
INTRODUCTION

Health Disparities Among African Americans/Black Americans

Health disparities are “preventable differences in the burden of disease, injury and violence, or opportunities to achieve optimal health experiences by socially disadvantaged racial, ethnic, and other populations, groups, and communities” (Centers for Disease Control and Prevention [CDC], National Center for Chronic Disease Prevention and Health Promotion, Division of Adult and Community Health, 2011). Poverty, environmental threats, inadequate access to health care, individual and behavioral factors, and educational inequalities are some of the numerous factors that may contribute to health disparities (CDC, National Center for Chronic Disease Prevention and Health Promotion, 2011). A few examples of health disparities faced by African Americans/Black Americans are as follows: compared to White Americans, African Americans/Black Americans are significantly more likely to rate their health as fair or poor (i.e., 8.7% vs. 14.2%, respectively; National Center for Health Statistics [NCHS], 2011). Overall mortality, as well as mortality due to stroke, heart disease, cancer, and diabetes, is higher for Black Americans than for White Americans (NCHS, 2010). Additionally, although overweight and obesity are staggeringly high among the American population in general, rates of overweight and obesity are higher among African American adults than among any other racial/ethnic group in the U.S. (NCHS, 2010).

African American vs. Black: A Note on Terminology

Both the terms *Black* and *African American* are used throughout this paper. It is important to note that although these terms may seem to be used interchangeably, they

are not synonymous. Some individuals identify as Black but do not identify as African American (e.g., Black Caribbeans); some individuals identify as African American, and some individuals identify as both African American (ethnically) and Black (racially). *Black* is typically a broader descriptor (i.e., may include both African American individuals as well as other Black individuals). Within the research literature, some studies identify their participants as Black, and some studies identify their participants as African American, while other studies may use a longer (but potentially more accurate) term of African American/Black (meaning African American or Black). In the literature review of this paper, when race/ethnicity descriptors are used to describe participants in a published study, the descriptors will be the same as those used by the authors of that study; otherwise, the term African American/Black will be used.

Health Disparities among African American/Black Men

In addition to health disparities that relate to the African American/Black population in general, there are significant disparities that relate specifically to African American/Black men. For instance, estimated life expectancy at birth is significantly lower for Black males (70.0 years) as compared with both White males (75.9 years) and Black females (76.8 years; NCHS, 2010). It is also the case that African American men are 30% more likely to die from heart disease and 60% more likely to die from stroke than non-Hispanic White men (U.S. Department of Health and Human Services [USDHHS], Office of Minority Health [OMH], 2009).

Compared with African American women, African American men also have higher cancer incidence rates overall (USDHHS, National Institutes of Health [NIH], National Cancer Institute [NCI], 2010) and higher death rates due to heart disease (Xu, Kochanek, Murphy, & Tejada-Vera, 2010). Yet, not surprisingly, health promotion

research is typically more commonly conducted with African American women than with African American men. For example, an automated search within the widely-used PubMed database for journal articles (published within the past 10 years and written in English) with the keywords “African American or Black”, “health promotion”, and “women or female” resulted in 837 articles; however, when “women or female” was replaced with “men or male” (and the other keywords remained the same), the search produced only 588 articles (search conducted by the author in June 2011).

The Importance of Healthy Eating in Reducing Health Disparities

National health authorities state that the most effective approach to addressing the leading causes of death in the U.S. is to reduce and prevent underlying health risk factors, including poor nutrition, physical inactivity, tobacco use, and excessive alcohol use. Accordingly, the objectives of Healthy People 2020 include numerous nutrition-related goals, including increased consumption of fruits, vegetables, and whole grains, as well as decreased consumption of calories from fat, added sugars, saturated fat, and sodium (USDHHS, 2011). Good nutrition can help lower the risk for many diseases, including heart disease, stroke, diabetes, and some cancers (USDHHS, National Prevention, Health Promotion, and Public Health Council, 2010); thus, the prevalence of four of the five leading causes of death among African Americans (i.e., heart disease, cancer, cardiovascular disease, and diabetes; CDC, NCHS, 2011) could be decreased through engagement in recommended dietary behaviors (e.g., eating a diet that is low in fat, added sugars, and sodium, and eating recommended amounts of fruits, vegetables, and whole grains).

Churches as Health Promotion/Intervention Sites

Churches and other faith-based organizations have recently received increased attention from health promotion researchers as useful settings for implementing community-based health promotion and intervention programs for the purposes of decreasing obesity and other chronic diseases and reducing health disparities. Several studies have reported implementing health-related intervention programs within faith-based organizations in African American/Black communities (e.g., Kannan, Sparks, DeWitt, Krishnakumar, & Lumeng, 2010; Resnicow et al., 2004; Tucker et al., 2012; Wilcox et al., 2010). Such programs have typically focused on decreasing obesity and other diet-related diseases (e.g., type II diabetes) through improving diet and increasing physical activity; however, some of these programs have targeted other health promoting behaviors such as engagement in cancer screenings.

Given this prominent trend of using churches as intervention sites, and given the centrality of faith and religion within mainstream African American culture, it is important to understand how religious beliefs may influence individuals' engagement in health promoting behaviors such as healthy eating. However, such information is currently limited. Ellison and colleagues (2010) point out the need for further research on the intersection of race, religion, and health behaviors; additionally, these authors indicate that of the limited research that has been conducted in this area, alcohol and tobacco use has received particular attention (Ellison, Hummer, Burdette, & Benjamins, 2010).

Religiosity/Spirituality and Health

Research on religiosity/spirituality and health has "shown consistent and accelerating growth" (Masters, 2007, p. 287). Among community samples of U.S. adults, research suggests that frequent religious practice is associated with living

longer, even after controlling for confounding variables (Larson, Larson, & Koenig, 2002). Authors of a systematic review of literature on the linkages between religiosity/spirituality and physical health reported the following wide-ranging conclusions: (a) weekly church/service attendance is associated with improved physical and mental health behaviors, with the association being stronger for women than for men, (b) religiosity/spirituality protects against cardiovascular disease, possibly due in part to promotion of a healthy lifestyle, (c) the association between religiosity/spirituality and cancer mortality is confounded by prior health status (i.e., people who become sick are more likely to become increasingly religious/spiritual), (d) there is a lack of evidence for the general hypothesis that *depth* of religiousness is predictive of mortality, (e) there is inadequate support for religion/spirituality being protective against disability, (f) there is little evidence that religiosity/spirituality slows the progression of cancer, (g) it is inconclusive whether use of religious coping results in a longer life, (h) there is a lack of support for religiosity/spirituality improving recovery from acute illness, and (i) some evidence suggests that religiosity/spirituality impedes recovery (Powell, Shahabi, & Thoresen, 2003). The overall conclusion of the authors of the review is “that a relationship between religion or spirituality and physical health does exist but that it may be more limited and more complex than has been suggested by others” (Powell, Shahabi, & Thoresen, 2003, p. 50).

The potential pathways (mechanisms) by which religiosity or spirituality influences health are varied and unclear. Park (2007) reviewed a multitude of potential pathways, including meaning in life, social support, health locus of control, body sanctification, health behaviors, positive and negative affect and stress moderation, treatment

adherence, and coping. Park concluded that research is particularly needed that examines the process by which religiosity and spirituality may influence individuals' *lifestyle choices* and ultimately influence their health.

Although some studies have found religiosity to be associated with healthy lifestyle choices such as choosing not to smoke cigarettes (e.g., Koenig et al., 1998) and engaging in preventative health care behaviors such as cancer or cholesterol screenings (e.g., Reindl Benjamin & Brown, 2004), there is a lack of research that examines potential associations between religiosity/spirituality and healthy eating behaviors in particular. Interestingly, interviews with African American church members suggest that the relationship between religiosity and health may be stronger for avoiding health risk behaviors (e.g., alcohol and drug use) than for increasing health promoting behaviors (e.g., healthy eating; Holt & McClure, 2006). In an effort to address the need for research on the relationship between religiosity and health behaviors, the present study examines *God locus of health control* as a pathway by which religiosity/spirituality may be associated with healthy eating behaviors.

God Locus of Health Control as a Potential Predictor of Health Behaviors

God locus of health control (GLHC) is the extent to which an individual believes that God controls one's health (Wallston et al., 1999). Although God locus of health control may be perceived as a form of external (vs. internal) locus of control, research has demonstrated the validity of GLHC as a construct that is distinct from other dimensions of health locus of control (e.g., powerful others; Chaplin et al., 2001). It is also important to note that the GLHC construct shares some similarities with the concept of *fatalistic health beliefs* (i.e., the idea that one's health is outside of one's control), a potentially more familiar construct. The idea that one cannot control the

outcome of one's health has been proposed in research as a potential barrier to engaging in preventative health practices; for example, fatalistic beliefs about cancer have been found to be negatively correlated with exercising regularly, abstaining from smoking, and eating recommended amounts of fruits and vegetables (Niederdeppe & Levy, 2007).

The body of research on God locus of health control as a potential predictor of health or engagement in health behaviors is rather limited. However, it is interesting to note that much of the research that has been conducted on the potential association between God locus of control and health behaviors has focused specifically on African American/Black participant samples. Some findings from the few studies that have been conducted in this area suggest that endorsing a high God locus of health control is associated with poorer diabetes management (O'hea et al., 2005) and lower engagement in prostate cancer screening (Leaks, 2009) and breast cancer screening (Kinney, Emery, Dudley, & Croyle, 2002). However, other research has suggested a lack of association of God locus of health control with nutrition behaviors and physical activity behaviors (e.g., Gonnerman, Lutz, Yehieli, & Meisinger, 2008).

Given that religiosity is traditionally a central component of African American culture, it is important that religiosity-related constructs be examined in relation to health behaviors and health care practices (Polzer & Miles, 2005). It is noteworthy that some differences in beliefs about the roles of God in relation to health and illness have been linked to race/ethnicity. For example, authors of a qualitative study involving older rural African Americans and Whites found that the White older adults presented limited God-health beliefs in comparison to the African American older adults; specifically, African

American participants in the study identified various roles of God in relation to health, including comforter of the sick, arbiter, guardian, health communicator, evaluator, savior, and miracle maker, whereas White participants only identified the concept of God as a miracle maker (and to a much lesser degree than did African American participants; McAuley, Pecchioni, & Grant, 2000). Overall, the amount of research that exists on potential associations between God locus of health control and engagement in health promoting behaviors is highly limited, making it challenging to draw conclusions about this topic until further research has been conducted.

CHAPTER 2
LITERATURE REVIEW

Health Disparities

Numerous definitions exist for the term *health disparity* (Carter-Pokras & Baquet, 2002). One definition is that health disparities are “preventable differences in the burden of disease, injury and violence, or opportunities to achieve optimal health experiences by socially disadvantaged racial, ethnic, and other populations, groups, and communities” (Centers for Disease Control and Prevention [CDC], National Center for Chronic Disease Prevention and Health Promotion, Division of Adult and Community Health, 2011). Another definition is that health disparities are “differences that occur by gender, race or ethnicity, education or income, disability, living in rural localities, or sexual orientation” (US Department of Health and Human Services [USDHHS], 2000). For a review of various definitions of health disparity, see Carter-Pokras and Baquet (2002).

Multiple factors contribute to health disparities, including poverty, environmental threats, inadequate access to health care, individual and behavioral factors, and educational inequalities (CDC, 2011), as well as lack of access to safe and affordable housing, fresh and affordable fruits and vegetables, transportation, and culturally appropriate interventions and services (World Health Organization [WHO], 2008). Thus, although this paper specifically focuses on personal/psychological factors and on a specific health promoting behavior (i.e., healthy eating), the author recognizes that there are numerous and varied contributing causes to health disparities, many of which are socioenvironmental (WHO, 2008), and are beyond the scope of this literature review. Additionally, although the topic of proposed study involves African American/Black men

as the primary focus, the author of this study recognizes that health disparities occur among and within a multitude of demographic groups.

Prominent Health Disparities among African American/Black Adults

There are many examples of health disparities that have a disproportionately negative impact on African American and Black adults. For example, in 2007, overall mortality was 25% higher for Black Americans than for White Americans, and in 2006, age-adjusted death rates of Black Americans exceeded those of White Americans by 48% for death caused by stroke, 31% for death caused by heart disease, 21% for death caused by cancer, and 113% for death caused by diabetes (National Center for Health Statistics [NCHS], 2010). Additionally, although obesity is staggeringly high among the American population in general, obesity rates are higher among African Americans than any other racial/ethnic group in the U.S. (NCHS, 2010). Heart disease, malignant neoplasms (cancer), cerebrovascular disease (stroke), and diabetes are among the five leading causes of death for African Americans (NCHS, 2011).

High Prevalence of Cardiovascular Diseases among African American/Black Adults

Heart disease and stroke are two types of cardiovascular diseases (i.e., diseases of the heart and blood vessels). Specifically, a stroke is a serious medical condition that occurs when flow of oxygen-rich blood is blocked to part of the brain (USDHHS, NHLBI, 2011). Coronary heart disease (i.e., heart disease) is a disorder of the blood vessels of the heart that can lead to heart attack (USDHHS, NHLBI, n.d.). Heart disease is the leading cause of death for all Americans (NCHS, 2011). Among other major risk factors (e.g., older age, smoking tobacco) that contribute to heart disease are being of the male

sex, being African American, having excess body fat, having high blood pressure (i.e., hypertension), and having diabetes (American Heart Association [AHA], 2011).

African American adults are more likely than White adults to be diagnosed with heart disease and to die from heart disease. Specifically, age-adjusted heart disease death rates have been estimated to be 251.9 per 100,000 population for African Americans and 191.4 per 100,000 population for non-Hispanic White Americans (Xu, Kochanek, Murphy, & Tejada-Vera, 2010). Similarly, the National Stroke Association estimates that African Americans are twice as likely to die from stroke as Caucasian Americans and more likely to experience stroke earlier in life as compared with Caucasians. Risk factors that appear to contribute to this health disparity include diabetes, sickle cell anemia, smoking, obesity, and high blood pressure (National Stroke Association, 2012). At 44% prevalence, African American adults have among the highest rates of hypertension in the world (Roger et al., 2011).

High Prevalence of Cancer among African American/Black Adults

Cancer is the second leading cause of death, both among African Americans and among the overall U.S. population (CDC, NCHS, 2011). However, for most cancers, African Americans experience the highest death rates of any racial and ethnic group in the United States. Overall, cancer death rates are estimated to be 32% higher among African American men than White men and 16% higher among African American women than in White women, despite an overall decline in racial disparities for cancer death rates. Among African Americans, the most common cancer-related causes of death are from (1) lung and bronchus cancers, (2) prostate cancer (for men) and breast cancer (for women), (3) colon and rectum cancer, and (4) pancreatic cancer (American Cancer Society, 2011).

High Prevalence of Diabetes among African American/Black Adults

Diabetes is a group of diseases marked by high levels of blood glucose resulting from defects in insulin production and/or insulin action (CDC, 2011). Diabetes is a serious health condition that puts one at risk for a variety of other serious health complications, including blindness, heart disease, stroke, amputations, and nerve damage (USDHHS, National Institute of Diabetes and Digestive and Kidney Diseases [NIDDK], National Diabetes Information Clearinghouse, 2008). Diabetes is also the leading cause of kidney failure. Recent research estimates that 4.9 million, or 18.7% of all non-Hispanic Black adults aged 20 years or older, have (diagnosed or undiagnosed) diabetes. The risk of diagnosed diabetes is estimated to be 77% higher among non-Hispanic Black Americans as compared to non-Hispanic White Americans (CDC, National Center for Chronic Disease Prevention and Health Promotion, Division of Diabetes Translation, 2011). In fact, although diabetes has been designated the seventh leading cause of death in the U.S., it is the fifth leading cause of death among African Americans (Xu et al., 2010).

Prominent Health Disparities among African American/Black Men

High Prevalence of Cardiovascular Diseases among African American/Black Men

Estimated death rates due to heart disease are substantially higher among African American men (311 deaths per 100,000 population) as compared with both non-Hispanic White men (239 deaths per 100,000 population) and African American women (208 deaths per 100,000 population; Xu et al., 2010). Rates of hypertension are also more prominent among Black men than Black women; specifically, among non-Hispanic Black adults who are 20 years of age and over, the age-adjusted percentage of individuals with high blood pressure (a major risk factor for heart disease; AHA, 2011)

was 23.9 for women and 26.5 for men (from 2003-2006; NCHS, 2010). With regard to mortality due to cardiovascular diseases, African American men are 30% more likely to die from heart disease and are 60% more likely to die from stroke than non-Hispanic White men (USDHHS, OMH, 2009).

High Prevalence of Cancer among African American/Black Men

Estimated overall cancer incidence rates are higher among African American men than African American women (i.e., 88,860 for men vs. 80,040 for women). Similarly, although overall cancer death rates have been decreasing at a faster rate among African American males than among African American females, African American males continue to experience significantly higher mortality caused by cancer as compared with African American females (American Cancer Society, 2011). The impact of cancer health disparities on African American/Black men is also evident when comparing these men to men from other racial/ethnic backgrounds. For example, past research has suggested that African American men were 1.3 times more likely to be diagnosed with lung cancer and 1.4 times more likely to be diagnosed with prostate cancer, as compared to non-Hispanic White men. Additionally, it has been found that African American men are nearly twice as likely as non-Hispanic White men to be diagnosed with stomach cancer and 2.5 times as likely to die from prostate cancer (CDC, NCHS, 2011).

High Prevalence of Diabetes among African American/Black Men

The Centers for Disease Control and Prevention reports that the age-adjusted prevalence of diagnosed diabetes is 6.3% for White men, 7.9% for Hispanic men, and 8.5% for African American men. In contrast to the previously mentioned diseases, diabetes rates are actually higher among African American women than among African

American men (CDC, 2010). African American men have been estimated to be 2.1 times more likely than non-Hispanic White men to start treatment for end-stage renal disease related to diabetes and to be twice as likely to die from diabetes (CDC, National Center for Chronic Disease Prevention and Health Promotion, Division of Diabetes Translation, 2010).

Influence of Obesity and Diet on Leading Causes of Death

National health authorities clearly state that the most effective approach to addressing the leading causes of death in the U.S. (e.g., heart disease, cancer) is to reduce and prevent the underlying risk factors of those diseases, including poor nutrition (i.e., as well as physical inactivity, tobacco use, and excessive alcohol use; USDHHS, 2011). As such, the objectives of Healthy People 2020 include numerous nutrition-related goals, including increased consumption of fruits, vegetables, and whole grains, as well as decreased consumption of added sugars, saturated fat, sodium, and calories from fat (USDHHS, 2011). Good nutrition can help lower the risk for many diseases, including heart disease, stroke, diabetes, and some cancers (USDHHS, National Prevention, Health Promotion, and Public Health Council, 2010); thus, one reasonable approach to decreasing four of the five leading causes of death among African Americans (i.e., heart disease, stroke, cancer, and diabetes; CDC, NCHS, 2011) is through targeting dietary behaviors.

Obesity is associated with a number of health problems, including each of the above-mentioned leading causes of death. People who are overweight are more likely to experience high blood pressure, hyperlipidemia, and high LDL cholesterol, all of which are risk factors for heart disease and stroke (Trust for America's Health, 2006). Although the prevalence of obesity is staggeringly high among the American population

as a whole, obesity rates are higher among African Americans than among any other racial/ethnic group in the U.S.; in fact, the Centers for Disease Control and Prevention has estimated that the proportion of non-Hispanic Black males who are obese is 35% (CDC, NCHS, 2010).

Although cancer incidence is associated with various risk factors, previous research has estimated that 14% of deaths from cancer in men are due to overweight and obesity (Calle, Rodriguez, Walker-Thurmond, & Thun, 2003) and recent research has estimated that overweight and obesity cause approximately 20% of all cancer cases (Wolin, Carson, & Colditz, 2010). Furthermore, a recent review of research states that approximately 85,000 new cancer cases in the U.S. per year are related to obesity, and that as body mass index increases by 5 kg/m^2, risk of death from cancer increases by 10% (Basen-Engquist & Chang, 2011). National health authorities state that behavioral factors such as quitting smoking, eating a healthy diet, and exercising regularly can decrease the risk of some types of cancers (e.g., USDHHS, NIH, NCI, 2011a); however, it is unknown whether or not eating a healthy diet can decrease the risk of certain cancers such as prostate cancer (USDHHS, NIH, NCI, 2011b). Even so, public health/healthcare organizations such as the Mayo Clinic and the Prostate Cancer Foundation recommend decreasing prostate cancer risk through engaging in healthy eating behaviors, such as eating a low-fat diet rich in fruits, vegetables, and fish, and maintaining a healthy weight (Mayo Clinic, 2009; Prostate Cancer Foundation, 2011).

In addition to heart disease, cancer, and stroke, another leading cause of death among African Americans is diabetes. The majority (i.e., 90-95%) of Americans who are diabetic have type 2 diabetes. In addition to risk factors such as family history, older

age, physical inactivity, and being of certain racial/ethnic backgrounds (e.g., African American), type 2 diabetes is associated with being overweight. In fact, researchers have estimated that approximately 80% of people with type 2 diabetes are overweight (USDHHS, NIDDK, National Diabetes Information Clearinghouse, 2008). Thus, one reasonable strategy for preventing diabetes (as well as cardiovascular disease, cancer, and stroke) is decreasing overweight/obesity, in part through the promotion of engagement in healthy eating behaviors.

Churches as Health Promotion/Intervention Sites

Research suggests that 10% of U.S. congregations report having at least one formal health-related program, and 18% of attendees report being part of a congregation that offers a health-related program (Trinitapoli, Ellison, & Boardman, 2009). Churches and other faith-based organizations have become increasingly popular sites for community-based health promotion/intervention programs and research studies (Campbell et al., 2007). This may be the case for a number of reasons, such as the availability of the needed space and participants for conducting health promotion interventions and research. However, use of faith-based organizations for these purposes may also present some challenges (e.g., overcoming mistrust of research from pastors and congregants, respecting organizational values and norms, deciding whether or not to incorporate religious beliefs to make the program *faith-based* or to simply make it *faith-placed*; for further information, see Campbell et al., 2007).

Churches have received particular attention as settings for implementing health promotion/intervention programs within African American/Black communities. Recent examples of such interventions include the Body & Soul Program (Resnicow et al., 2004), Healthy Eating and Harambee (Kannan, Sparks, DeWitt, Krishnakumar, &

Lumeng, 2010), the Faith, Activity, and Nutrition (FAN) Program (Wilcox et al., 2010), The WORD (Wholeness, Oneness, Righteousness, Deliverance; Kim et al., 2008), and the Health-Smart Church Program (Tucker et al., 2012). Such programs have typically focused on decreasing obesity and other diet-related diseases (e.g., type II diabetes) through improving diet and increasing physical activity, although some programs have targeted other health promoting behaviors, such as engaging in preventative cancer screenings.

Given the evidence that church-based health promotion programs have much potential for promoting healthy behaviors (Campbell et al., 2007; Newlin, Dyess, Allard, Chase, & Melkus, 2011), it is important to understand if and how religious beliefs may influence individuals' engagement in health promoting behaviors such as healthy eating. Additionally, given the centrality of faith and religion within mainstream African American culture, as well as the movement to use faith-based organizations within African American/Black communities as sites for health intervention programs, it is particularly important understand if/how faith-related factors influence African Americans' engagement in the health promoting behaviors. Holt and McClure (2006) note that (a) few church-based health promotion programs directly integrate religiosity into the content of their interventions and (b) it is unclear how integrating religious beliefs into health programs might affect risk behaviors versus prevention behaviors. It is challenging to determine what portion of health programs that are housed in faith-based organizations actually incorporate a direct religious component, as reviews of such programs often do not include examination of the potential impact of religiosity on the intervention.

Links Between Religiosity/Spirituality and Health

Given the great deal of research that has been conducted on the very broad topic of the relationship between religiosity/spirituality (R/S) and health, it may be helpful to first offer a sample conceptualization of the multiple viewpoints on this topic. Seybold (2007) conceptualizes researchers who study the association between R/S and health (i.e., mental health and physical health) as typically being in one of two camps. One camp holds the view that R/S has a positive association with physical and mental health, as indicated by findings such as positive correlations between R/S and health habits and negative correlations between R/S and mortality, heart disease, stroke, cholesterol levels, depression, suicide, substance abuse, and risky sexual behaviors (e.g., Koenig et al., 2001, Larson and Larson, 2003, as cited by Seybold, 2007). The second camp denies that there is significant empirical evidence of a link between R/S and positive health outcomes (e.g., Sloan & Bagiella, 2002, as cited by Seybold, 2007). Seybold added that there are other researchers who are not quite in either camp (e.g., Thoresen & Harris, 2002, as cited by Seybold, 2007), and these researchers uphold a middle ground in which the relationship between R/S and health "should not be dismissed by critics" but also is "more complex than proponents sometimes state" (p. 304).

Defining Religiosity and Spirituality in Health-Related Research

Historically, when health-related studies have included a measurement of religiosity and/or spirituality, researchers have examined religiosity or spirituality as "add-on variables in the context of other research agendas" and have relied on "brief (frequently single-item) and imprecise global indices, such as frequency of church attendance, denominational affiliation, or self-rated religiousness and spirituality" (Hill &

Pargament, 2003, p. 65). For instance, in a review by Koenig and colleagues (2001) of studies that examined the association between religiosity/spirituality (R/S) and mortality, almost half of the reviewed studies measured religious affiliation (only), without incorporating any other measures of religiosity or spirituality. Hill and Pargament (2003) question the reliability of such brief and uni-dimensional measures and also suggest that such measures may miss potential harmful effects of religion and spirituality on health (i.e., negative associations between R/S and health). Additionally, it is interesting to note that over the past few decades, studies in psychology and other behavioral sciences have demonstrated a trend toward assessing spirituality as well as religion (i.e., as opposed to the prior norm of assessing only religion) in research addressing potential connections between these variables and health (Weaver, Pargament, Flannelly, & Oppenheimer, 2006).

The debate over how to define and measure religiosity and spirituality is vast and goes beyond the scope of this paper; however, a number of thorough and thought-provoking writings are available for more information on this subject (e.g., Chiu, Emblen, Hofwegen, Sawatzky, & Meyerhoff, 2004; Hall, Meador, & Koenig, 2008; Hill & Pargament, 2003; Idler et al., 2003; Moberg, 2002). Idler and colleagues (2003), who created a multidimensional measure of religiousness and spirituality, contend that the lack of reliable and validated measures of religiosity and spirituality has been one of the greatest barriers to research in this area. Seybold and Hill (2001) also explain that multidimensional measures of religion and spirituality were developed in response to concerns about inconsistencies in measuring and defining religiosity and spirituality, noting that such inconsistencies may be partially responsible for the conflicting findings

on the nature of the association(s) between religiosity and health. In a thorough review of existing measurements of religiosity and spirituality for health research, Hall and colleagues (2008) similarly report that “no single approach has yet emerged as a standard” and that “most existing measures of religiousness are limited by the attempt to quantify religiousness ‘in-general’.” These authors conclude that “despite significant progress, much remains to be done” (Hall et al., 2008, pp. 157-158).

Defining Health

Defining *health* is a complicated matter. The World Health Organization defines health as “a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity” (WHO, 2003). This definition, maintained since 1948, has received criticisms, mostly in relation to the impracticality of the term *complete* (Huber et al., 2011). A recent article by Huber and colleagues (2011) reviews the limitations of this definition and proposes a framework for reformulation. These authors discuss that on one hand, it may be sensible to consider health to be a general concept, and on the other hand, operational definitions are needed for practical purposes such as measurement, research, and evaluation of interventions.

In addition assessing physical or mental health status (e.g., presence or absence of health conditions), from a preventative and practical perspective, it is useful to measure health behaviors. Although from a traditional medical perspective, people are considered healthy if they are uninjured and free of disease, an alternative perspective is that a person may be considered unhealthy due to having *risk factors* for a disease (Institute of Medicine Committee on Health and Behavior: Research, Practice, and Policy, 2001). Given that some of the prominent underlying risk factors for the leading causes of death in the U.S. are behavioral in nature (e.g., physical inactivity, poor

nutrition, tobacco use, and excessive alcohol use; USDHHS, 2011), it is sensible to include health behaviors when examining relationships between psychosocial variables (e.g., religiosity) and health, particularly because of the potential for intervention. As stated by Hwu (2001), “health behavior emphasizes self-care rather than expert care, and promotes an active, independent attitude toward health care” (Hwu, 2001, p. 166).

Drawing conclusions from the body of literature examining potential associations between religiosity/spirituality (R/S) and health is complicated not only by the challenges related to measuring religiosity-related variables (discussed in the prior section), but also by the great number of ways that *health* may be operationalized. Regarding this line of research, Seybold and Hill (2001) note that careful attention must be paid to the measurement of health in addition to the measurement of R/S. These authors explain that studies on associations between religiosity and health have used a wide variety of operationalizations of health, ranging from specific health indices (e.g., blood pressure), to mental health-related behaviors (e.g., drug and alcohol abuse), to general and subjective measures (e.g., self-reported health), and that “specific behavioral indices of physical and mental health” may be indicated instead (Seybold & Hill, 2001, p. 22).

Some examples of the physical and mental health variables that have been examined in association with R/S include the following: overall mortality, cardiovascular disease incidence, cancer mortality, disability, cancer progression, and recovery from acute illness (e.g., see review by Powell, Shahabi, & Thoresen, 2003), outcomes after stroke (e.g., Colantonio, Kasl, Ostfeld, & Berkman, 1993), outcomes after heart surgery (e.g., Contrada et al., 2004), mobility (e.g., Fitchett, Rybarczyk, DeMarco, & Nicholas, 1999), depression (e.g., Fitchett et al., 1999), life satisfaction/quality of life (e.g., Fitchett

et al., 1999; Rippentrop, Altmaier, & Burns, 2006), cigarette smoking (e.g., Koenig et al., 1998), preventative health care utilization (e.g., Reindi Benjamins & Brown, 2004), and engagement in cancer screening (e.g., Abernethy, Houston, Bjorck, Gorsuch, & Arnold, 2009). Clearly, research on the associations between R/S and health (however defined) is vast and varied; thus, generalized statements about such associations may be risky, especially given the functional and conceptual differences in defining health in terms of physical health outcomes, versus mental health status, versus health behaviors. The remainder of this literature review will focus primarily on studies examining physical health outcomes (e.g., cardiovascular disease) and health behaviors (e.g., cancer screenings), rather than mental health status (e.g., depression).

Determining the Population of Focus

Drawing conclusions about the relationships between religiosity/spirituality (R/S) and health is additionally complicated by the variety of populations on which such research has been conducted. The majority of studies within this body of literature appear to focus on the health outcomes of clinical populations with serious illnesses or chronic diseases. A few examples of such patient populations are heart surgery patients (e.g., Contrada et al., 2004; Oxman, Freeman, & Manheimer, 1995), stroke patients (e.g., Giaquinto, Spiridigliozzi, & Caracciolo, 2007), and chronic pain patients (e.g., Rippentrop, 2005). It is important to consider, however, that connections between R/S and health-related factors may differ among individuals with acute or chronic illnesses versus persons from non-clinical samples (i.e., community-based samples).

From a *prevention* perspective, it is necessary to understand how various psychosocial factors are associated with health or engagement in health behaviors *prior* to the development of chronic illnesses. Although studies on the associations between

R/S and health among general (community-based) populations seem to have increased within the past decade, more of such research is needed in order to understand the potential roles of religiosity in health promotion and early intervention efforts. Additionally, George and colleagues (2002) assert that more than half of the research on the religiosity-health connection is based on samples of older adults (George, Ellison, & Larson, 2002). However, the older population may be a less prominent target with regard to preventative health efforts; thus, from a prevention orientation, it is important for future research in this area to include individuals from a spectrum of ages. Lastly, in order to ensure that findings from studies on religiosity and health are as useful as possible in disease prevention efforts, it may be important for future research to examine the variables of discussion among specific (non-clinical) population sub-groups, especially those sub-groups that experience significant disparities in relation to health (e.g., African American/Black men).

Religiosity/Spirituality and Health: Positive Associations

Generally speaking, there is thought to be a positive relationship between religiosity and health, such that self-reported religiosity/spirituality (R/S) predicts better health. A great deal of research has been conducted that supports this notion. Because the literature on positive associations between R/S and health outcomes/health status is vast, only meta-analyses and literature reviews will be cited here with regard to this specific topic; on the other hand, individual research studies will be cited with regard to associations between R/S and health *behaviors* (i.e., as opposed to health outcomes/status variables), because such studies are less numerous.

Possibly the most consistent finding among meta-analyses that examine the relationship between R/S and health is that religious involvement (often measured as

attendance at religious services) is negatively associated with mortality. In other words, higher involvement is predictive of decreased mortality (e.g., McCullough, Hoyt, Larson, Koenig, & Thoresen, 2000; Williams & Sternthal, 2007). Interestingly, however, a recent meta-analysis of 91 studies found that religious involvement was positively associated with reduced mortality among healthy populations, but not among diseased populations (Chida, Steptoe, & Powell, 2009).

In their review, George and colleagues' (2000) indicate that religiosity typically has been found to have a protective effect against mortality (i.e., both mortality from cardiovascular disease and cancer as well as mortality from all causes), with this effect being strongest when religiosity is operationalized as attendance at religious services (i.e., as opposed to other measures of religiosity). Findings from this review also suggest that religiosity is positively associated with (a) a reduced incidence of disease and disability, (b) recovery from physical illness, (c) increased tolerance of pain, and (d) prevention of and recovery from mental illness and substance abuse. The authors add that the association between religious involvement and health outcomes is stronger for *mental* health outcomes than for *physical* health outcomes or mortality. The authors also describe some limitations of the studies that they reviewed. For example, with regard to the common operationalization of religiosity as frequency of attendance at religious services, they indicate that it is important to consider the confounding factor that individuals must maintain a certain baseline threshold of health in order to be capable of attending religious services (George, Larson, Koenig, & McCullough, 2000). In other words, operationalizing R/S as frequency of attendance at religious services

does not take into account those individuals who are, for example, highly religious but too ill to attend religious services.

In a levels-of-evidence review of literature on the linkages between religiosity/spirituality and physical health, researchers concluded that (a) religiosity/spirituality has a protective effect against cardiovascular disease, and (b) weekly church/service attendance is associated with improved physical and mental health behaviors, with the association being stronger for women than for men (Powell et al., 2003). Additionally, data from the well-known National Health and Nutrition Examination Survey (NHANES III), which included a sample of over 14,000 American male and female adults, indicates that on average (after controlling for socio-demographic and health variables), individuals who attend religious services *weekly or more than weekly* have lower systolic blood pressure as compared to individuals who *never attend* religious services; these frequent attenders also exhibited a somewhat lower hypertension prevalence than non-attenders (Gillum & Ingram, 2006). It is notable, however, that these findings are based on a single-item question about attendance at religious services, as opposed to a broader or multidimensional measure of religiosity and spirituality.

Additionally, positive associations between religiosity/spirituality and health have been found among African American/Black American adults specifically. For example, Brown and Gary (1994) examined the associations between religious involvement and health status/behaviors among 537 African American males living in an urban area. Results of this study indicated (a) lower depression levels among males who reported moderate to high frequency of church attendance and (b) better self-reported mental

health among males who were affiliated with a religious denomination versus those who were unaffiliated. Similarly, in a study of 3,963 persons age 65 years or older, it was found that blood pressure was lower on average among individuals who attended religious services and prayed or studied the Bible frequently, as compared with individuals who had a low frequency of engaging in these religious activities. This trend was found even after controlling for a number of potentially confounding variables such as age, education, and body mass index. The researchers of the study noted that this difference in blood pressure was particularly notable among the Black participants in their sample (Koenig et al., 1998).

Furthermore, Ellison and colleagues (2000) have reported that very frequent church attendance among African Americans was positively associated with lower mortality and longer life, in that African Americans who reported that they *never* attend church had two-times higher mortality rates (over a nine-year period) than those who reported attending church *more than once per week*. Ellison and colleagues also noted that the degree of difference in mortality between very frequent church attenders versus non-attenders in their (exclusively) African American sample was larger than that which had been reported in similar studies involving the general population (Ellison, Hummer, Cormier, & Rogers, 2000).

Religiosity/Spirituality and Health: No Associations or Negative Associations

As described above, there is a great deal of research to suggest that significant and positive associations exist between religiosity/spirituality (R/S) variables and health-related variables. However, there are also findings from studies that suggest either negative associations between R/S and health or a lack of association between R/S and health. Some of these studies are described in the following paragraphs.

In a review of literature by Williams and Sternthal (2007), these authors report that despite significant support of positive associations between R/S and health, some research findings suggest a negative association between R/S and health. The potential negative effects summarized by these authors include the following: faith-based social relations as a source of stress, feelings of guilt contributing to illness, reliance on faith healing rather than on medical care, extrinsic religious orientation and negative religious coping as predictors of depressive symptoms, and among medically ill patients, religious doubts and struggle as predictors of mortality. These authors also point out that due to conflicting research findings, the relationship between religious participation and obesity is ambiguous.

Researchers of the large, population-based NHANES III study concluded that “no consistent associations” were found between “frequency of attendance of religious services and prevalence or levels of cardiovascular disease, dietary intake, or metabolic risk factors” (Obisesan, Livingston, Trulear, & Gillum, 2006, p. 445). The few exceptions to this summary statement included the findings that (a) fish intake was higher among frequent attenders, (b) stroke prevalence was *lower* in frequently attending African American women, and (c) obesity and diabetes rates were *higher* among frequent attenders than among infrequent attenders. However, this latter association (i.e., with regard to obesity and diabetes) was not significant when the researchers controlled for demographic variables (Obisesan et al., 2006).

In an analysis of literature (i.e., 266 articles) on claims about religion, spirituality, and health, Sloan and Bagiella (2002) suggest that there is not an abundance of literature demonstrating a protective effect of religiosity/spirituality on health. They

conclude that many of the studies cited by comprehensive reviews that support a beneficial effect of religiosity on health (i.e., on heart disease and hypertension in particular) (a) were not actually relevant to this claim, (b) had significant methodological flaws, and/or (c) were misrepresented in the secondary source (e.g., a study was considered to be an examination of religion and health solely because it was conducted in a church setting). In fact, Sloan and Bagiella report, “examination of these studies in the area of heart disease and hypertension revealed that there is little empirical support for claims of health benefits deriving from religious involvement” (pp. 19-20).

There are some studies that have examined the association among R/S and health among African American/Black Americans and have found mixed results or a lack of association between these variables. For example, Brown and Gary (1994) examined associations between religious involvement and health status/behaviors among 537 African American males living in an urban area. Results indicated that although religious involvement was found to have a positive influence on mental health, it was not found to be associated with overall physical health status or with hypertension. Additionally, it is interesting to take a closer look at the Ellison and colleagues (2000) study which found lower mortality among African Americans who frequently attended church versus those who did not attend church [described in the previous section on positive associations between religiosity and health]. Some interesting gender differences were found when the effects of selectivity factors (e.g., sociodemographic factors and baseline health status), social ties, and health behaviors were controlled. Specifically, the difference in mortality between frequent church attenders and church non-attenders *increased* among the African American women;

however, among the African American men, this differential *decreased* to the point of statistical nonsignificance (Ellison et al., 2000). Thus, for the African American males in this study, it may be interpreted that differences in mortality rates in association with church attendance frequency may be attributable to third-party variables rather than to a protective effect of involvement in organized religion.

In relation to the idea that religiosity/spirituality (R/S) might have a *negative* association with health, George and colleagues (2002) contend that although religious involvement might have a negative association with health variables among *small proportion* of individuals, this is not a pattern that has been found among samples as a whole. George and colleagues (2000) summarize their examination of prior research on the relationship between religiosity and health by describing that religious involvement has been mostly found to have either a positive effect or no effect on health and that they "have found no evidence that religion can harm health in *representative samples of community residents* or in *systematically sampled clinical populations*" (George et al., 2000, p. 110). Specifically, George and colleagues (2002) explain that among research studies with large samples (i.e., not including case studies or studies with small clinical samples), the small percentage that has shown a negative association between religiousness and health have been related to either (a) religions which recommend against seeking professional medical care or (b) negative religious coping (e.g., feeling punished or abandoned by God, believing sickness results from sin; George, Ellison, & Larson, 2002). Similarly, Seybold and Hill (2001) point out that although *positive* effects of religiosity/spirituality on health are more commonly observed, *negative* effects of religious and spiritual experience on health are most likely to occur when a person

believes either that he or she has direct communication with God with little or no social accountability or uses a deferral-to-God problem-solving strategy.

Although Powell and colleagues (2003) also support the conclusion that there is a clear protective link between religious service attendance and mortality, they contend that there is little evidence that *depth* of religiousness showed a similar protective effect. Additionally, their review generally found a lack of support for the view that religiosity/spirituality (R/S) protects against disability or assists in recovery from physical illness; in fact, they noted that religious beliefs may have harmful effects in patients who are ill if they (a) engage in negative religious coping, such as becoming upset that God has abandoned them, or (b) depend on their faith for recovery rather than on medical treatment. Overall, these researchers conclude, "a relationship between religion or spirituality and physical health does exist but…it may be more limited and more complex than has been suggested by others" (Powell et al., 2003, p. 50). They also pose an interesting suggestion that religion or spirituality may be "more powerful as a coping resource that buffers the *impact of disease* in *patients who are ill* than as a *resistance resource* in *healthy people* [italics added]" (p. 49). However, this idea may be confusing to interpret in light of the finding from a recent meta-analysis that R/S has a protective effect against mortality among healthy population samples but not among diseased population samples (Chida et al., 2009).

Mechanisms Involved in the Associations Between Religiosity/Spirituality and Health

Given the plethora of research suggesting significant associations between religiosity/spirituality (R/S) and health, with the majority of studies supporting a positive relationship, more recent research has attempted to examine the mechanisms of this

association. The potential mechanisms of this association have been summarized by a number of authors (e.g., Ellison & Levin, 1998; George, Ellison, & Larson, 2002; Park, 2007; Seybold & Hill, 2001). For example, in their review, Ellison and Levin (1998) summarize the potential *explanatory mechanisms* involved in the religion-health connection as follows: (1) discouragement of certain health-risk behaviors (e.g., substance use and abuse, risky sexual behaviors) and encouragement of low-stress lifestyle choices (e.g., decreased marital disruption); (2) provision of social resources (e.g., opportunities for social integration and social support); (3) promotion of positive self-feelings (e.g., self-worth, self-efficacy); (4) various forms of religious coping resources and coping behaviors (e.g., prayer, the perspective that difficult situations are opportunities for spiritual growth); (5) positive emotions (e.g., forgiveness, contentment, love); (6) healthy beliefs or learned optimism (e.g., expecting religious practice to benefit health or for piety to be rewarded with health and well-being); and (7) additional possible mechanisms/pathways that are not easily examined within the bounds of modern scientific research (e.g., direct effects of prayer or other types of spiritual healing).

Similarly, Seybold and Hill's (2001) literature review suggests the following potential mechanisms by which religion may influence health: (a) social networking/fellowship that serves to reduce psychological and physical stressors; (b) lifestyle behaviors (e.g., abstinence from smoking, alcohol/drug abuse, and sexual risk behaviors); (c) psychological factors (e.g., coping strategies, purpose and meaning, acceptance, optimism); and (d) emotions (e.g., forgiveness) and practices (e.g., meditation) that may have physiological benefits (e.g., improved immune function) via

stress reduction. George and colleges (2002) present four main categories of mediators, which have received varying degrees of support from past research. These mediators include (1) health practices, (2) social support, (3) psychosocial resources (e.g., self-esteem, self-efficacy), and (4) sense of coherence or meaning. Additionally, with regard to health practices, these authors suggest two main mechanisms by which religious involvement may potentially promote health protecting and health promoting behaviors. One mechanism is the common religious teaching that one should respect and care for one's body (e.g., "the body is the temple of the soul"; George et al., 2002, p. 193). The second mechanism is certain health practices/habits that some particular religious groups (e.g., Mormons) engage in as part of their religious teaching (e.g., abstaining from alcohol; George et al., 2002).

However, questions about the effect of religiosity on health behaviors are raised by studies such as the one by Hixon and colleagues (1998), which found that although religiosity was positively associated with decreased blood pressure among a sample of female adults of Judeo-Christian faiths, path analyses demonstrated that the *direct* effects of religiosity were more powerful than the *indirect* effects of religiosity by way of engagement in health behaviors (e.g., physical activity, diet, abstaining from smoking; Hixon, Gruchow, & Morgan, 1998). In other words, the positive association between religiosity and low blood pressure did not appear to be due to increased engagement in health promotion behaviors among more religious persons; rather, this positive association appeared to be primarily due to some kind of direct effect of religiosity on blood pressure.

In Park's (2007) examination of mechanisms using a meaning systems framework, she examined evidence from past research for the pathways of body sanctification, meaning in life, social support, positive and negative affect and stress moderation, treatment adherence, coping, health behaviors, and health locus of control. One of the author's conclusions was that despite the various proposed pathways between religiosity/spirituality and health, as well as some data that suggests associations between these variables, few studies have actually tested the proposed pathways. One of Park's specific recommendations for future research included the examination of processes in which religiosity/spirituality influences individuals' lifestyle choices that cumulatively influence their health.

Religiosity/Spirituality and Health Behaviors: Mixed Results

Findings on the examination of associations between religiosity/spirituality (R/S) and health behaviors (i.e., engagement in health promoting behaviors or avoidance of health risk behaviors) appear to be mixed. Some studies have found R/S to be positively associated with healthy lifestyle choices, such as not smoking cigarettes (e.g., Koenig et al., 1998), being less likely to abuse and/or become dependent on alcohol and other drugs, being more likely to recover from prior substance abuse/dependence (George et al., 2000), and engaging in preventative health care behaviors such as cancer or cholesterol screenings (e.g., Reindl Benjamins, Ellison, Krause, & Marcum, 2011; Reindl Benjamins & Brown, 2004). However, studies that measure religiosity and/or spirituality in a unidimensional manner are greatly limited in the depth of their findings, as compared to those that measure multiple dimensions of religiosity. For example, Reindl Benjamins and colleagues' (2011) research with a national sample of Presbyterian adults examined if use of preventive services (e.g., cholesterol screening,

flu shot, and colonoscopy) was associated with religious attendance, four aspects of health-related congregational support, and two health-related religious beliefs (i.e., sanctity of the body and God locus of health control). Findings were significantly more complex than simply demonstrating a relationship between religiosity and preventive services. Specifically, two aspects of health-related congregational support (e.g., discussing health issues with fellow church members) were associated with use of preventive services; however, neither sanctity of the body nor God locus of health control was related to use of preventive services. Furthermore, although religious attendance was significantly related to preventive services use, the authors report that the association appeared to be explained by age (Reindl Benjamins et al., 2011), a finding which suggests the importance of controlling for demographic variables in such research.

In a review and analysis of literature on the religion-health connection, Ellison and Levin (1998) report that research has demonstrated an inverse relationship between various religious variables and health-risk behaviors, such as risky sexual behaviors and substance abuse. For example, in a large epidemiological study of older adults, frequent attendance at religious services and frequent engagement in private religious activity were both significantly associated with being less likely to smoke cigarettes; however, the study's authors clarify that the religious older adults were less likely to ever start smoking, not more likely to quit smoking once they started (Koenig et al., 1998).

Interestingly, a study of over 900 African American women living in South Carolina found no association between attending religious services and participating in physical

activities. The authors note that their findings differ from those of some other studies but also note that a limited range of variability of religiosity among participants in their study might explain their findings' minimal statistical associations (Ainsworth, Wilcox, Thompson, Richter, & Henderson, 2003). In a large Utah-based study involving over 6,000 Mormon and non-Mormon adults, it was found that religious persons who attended church on a weekly basis exercised more frequently than religious persons who attended church less than weekly; however, when age, smoking status, education, marital status, and general health were controlled for, these differences were no longer found to be significant (Merrill & Thygerson, 2001).

Data from the highly regarded National Health and Nutrition Examination Survey (NHANES III), which included nearly 12,000 adults from various regions of the country, found significant differences in leisure-time physical activity in association with attendance at religious services among women 60 years or older without mobility limitations, but not among men of any age group, nor women between the ages of 20 to 59; Gillum, 2006). In a 28-year longitudinal study of data collected from 1965 to 1994, Strawbridge and colleagues (2001) found that weekly attendance at religious services was positively associated with quitting smoking and becoming physically active, and positively associated with stopping heavy drinking (for women but not for men), but weekly service attendance was not associated with getting medical checkups. Overall, the authors concluded that "over nearly a 30-year period, those attending services weekly were more likely than those attending less or not at all to both establish good health behaviors not already being performed and to maintain ones already established"

(Strawbridge, Shema, Cohen, & Kaplan, 2001, p. 70). A measure of dietary behaviors was not included in this study.

The number of studies examining associations between religiosity/spirituality and health promoting behaviors that include an examination of healthy eating behaviors appears to be significantly limited; a sample of these studies follows. A recent community-based study of adults 65 years or older (in which all of the participants were White) measured the associations among intrinsic and extrinsic religious orientation, body sanctification, relationship with God, and multiple health behaviors (including healthy eating), and found that stronger religiosity was generally associated with healthier behaviors. However, having an *extrinsic* religious orientation predicted *poorer* nutrition and *poorer* health responsibility, while having an *intrinsic* religious orientation predicted *better* nutrition. (Intrinsic orientation was described as having internalized religious values and beliefs, while extrinsic religious orientation was described as using religion as an instrumental means to an end, such as to feel better). Body sanctification predicted engagement in exercise but was not related to engagement in healthy eating behaviors. These analyses were conducted while controlling for both sociodemographic variables and service attendance (Homan & Boyatzis, 2010).

In a study of 546 adults living in upstate New York, religious factors were found to have few significant associations with fat intake and physical activity. Similarly to some of the previously mentioned studies, significant gender differences were found. Specifically, among women, religious commitment (operationalized as contributing money to religious causes) was positively associated with greater engagement in moderate and vigorous physical activity; however, it is difficult to interpret this finding

given that income was not included as a covariate. Among women, fat intake differed in association with religious denomination (i.e., Catholic women reported lower fat intake as compared with Conservative Protestant women, women with no religious preference, and women with *Other* religious denomination). Among men, divine social support was positively associated with engagement in moderate physical activity; however, for the males in this study, no relationship was found between religion and fat intake. The authors caution that due to the limited range of religiosity among the participants in their study, the results of this study may underestimate the effect of religion on health behaviors. Race/ethnicity was controlled for in the analyses for this study. However, race/ethnicity was measured only as *White* and *Other*, and potential racial differences were not examined by the authors (Kim & Sobal, 2004).

In the NHANES-III study, no significant differences were found between frequent attenders of religious services and infrequent attenders with regard to total and saturated fat intake (Obisesan et al., 2006). Additionally, in a study of over 400 African American church members in the Midwest, religiosity and spirituality were not found to significantly influence exercise, weight management, or participation in cancer screenings; however, religion and spirituality did have a significant *negative* association with healthy eating behaviors, in that participants who were *very or moderately religious* were least likely to report eating behaviors consistent with recommended nutrition guidelines, and participants who were *slightly spiritual* or *slightly religious* were more likely to report engagement in recommended dietary practices. The authors point out some limits on the generalizability of their study, in that the majority of the sample had health insurance, described their health as *good* or *excellent*, and was college

educated, middle or upper income, female, and recognized as leaders in their faith community (Underwood & Powell, 2006).

God Locus of Health Control

One religiosity variable that may influence the relationship between religiosity/spirituality and engagement in health promoting/prevention behaviors is *God locus of health control*. God locus of health control is the degree to which one believes that God controls one's health. Although the general concept of locus of control has been a popular psychological research topic for decades, examination of the specific concept of God locus of health control has been less frequent.

Historically, researchers (e.g., Welton, Adkins, Ingle, & Dixon, 1996) have discussed the need for a measure of God locus of control that is distinct from—as opposed to an extension of—other forms of locus of control, such as internal control, external control, and control by powerful others. Additionally, empirical support has been demonstrated for measuring God control as a separate dimension of locus of control (e.g., Chaplin et al., 2001; Wallston et al., 1999; Welton et al., 1996). God locus of health control is distinct from the general construct of God locus of control, which measures belief in God's control of one's life in general (i.e., as opposed to specifically in relation to one's health). Wallston and colleagues (1999) define God locus of health control as the extent to which an individual believes that God controls his/her health status.

McAuley and colleagues (2000) found qualitative differences in the beliefs about the roles of God in relation to health and illness between African American and White rural older adults. These researchers interviewed White rural older adults and African American rural older adults about their beliefs in God in relation to health and illness.

Despite many similarities in the beliefs of the White participants and the African American participants, the authors also noted some important differences in their beliefs. For instance, the African American elders as compared to the White American elders more often mentioned sin as a cause of illness; interestingly, however, participants who held this belief were more likely to attribute illness to sin in relation to others rather than to themselves. The authors also reported that African American participants were more likely than White American participants to (a) believe that God may use illness as a test of individuals and their faith and (b) "suggest that God works with doctors to promote healing or that God's health powers are superior to those of doctors" (McAuley, Pecchoni, & Grant, 2000, p. 27). Overall, McAuley and colleagues concluded that there were substantial differences in beliefs about the roles of God in relation to health and illness between the African American participants and the White participants in their study, despite the fact that all participants were older adults and lived in the same rural area. Specifically, the African American elders articulated a greater number of—and more specific—roles that God plays with regard to health and illness (McAuley et al., 2000). Although this study is exploratory and utilizes a very small sample, the findings suggest the possibility of racial/ethnic differences in beliefs about how God influences one's health.

Health Fatalism Beliefs as a Predictor of Health Behaviors

The concept of God locus of health control shares some similarities with the more familiar concept of health fatalism beliefs (i.e., the idea that one's health is outside of one's control). Health fatalism beliefs—the idea that one cannot control the outcome of one's health—has been proposed as a potential barrier to engaging in preventative health practices such as cancer prevention behaviors. Fatalistic beliefs about cancer

prevention have been found to be relatively common among the American population and have been found to be negatively correlated with engagement in health promotion behaviors such as exercising regularly, not smoking, and eating recommended amounts of fruits and vegetables (e.g., Niederdeppe & Levy, 2007). In fact, a national survey of over 6,000 Americans found that 27% of respondents agreed with this statement: “there’s not much a person can do to lower their chances of getting cancer” (Niederdeppe & Levy, 2007, p. 1000).

It is unclear whether or not racial/ethnic differences exist in the endorsement of fatalistic health beliefs. For example, Franklin and colleagues (2007) reported that African American participants in their Nashville-based study endorsed higher religious health fatalism than White Americans, while Niederdeppe and Levy’s (2007) national survey indicated endorsement of lower health fatalism beliefs among African Americans as compared to White Americans. The differences in the findings of these studies may be due to differences in the measurement of the health fatalism construct. For instance, religious health fatalism was measured in the first study, while in the second study, fatalism was measured in relation to cancer specifically, and the construct did not include a religious component.

In a study of over 1,000 Nashville residents, religious fatalism was found to predict (a) increased engagement in emotional eating and (b) poorer self-reported health status. However, religious fatalism but was not significantly associated with health care utilization behaviors, physical activity, or self-reported overeating. Religious fatalism beliefs were also found to be positively associated with *both* fat-*increasing* behaviors (e.g., eating fast food often) and fat-*decreasing* behaviors (e.g., choosing low-fat

options). This finding is difficult to interpret. Overall, findings from the study suggest that the relationship between religious fatalism and engagement in health behaviors is unclear and potentially complex (Franklin et al., 2007).

God Locus of Health Control: Development and Definition

Although the general concept of locus of control has been a popular psychological research topic for decades, examination of the specific concept of God locus of health control has been less frequent. Historically, researchers (e.g., Welton, Adkins, Ingle, & Dixon, 1996) have discussed the need for a measure of God locus of control that is distinct from—as opposed to an extension of—other forms of locus of control, such as internal control, external control, and control by powerful others. Additionally, empirical support has been demonstrated for measuring God control as a separate dimension of locus of control (e.g., Chaplin et al., 2001; Wallston et al., 1999; Welton et al., 1996). The proposed study utilizes the God locus of health control measure by Wallston and colleagues (1999). These authors define God locus of health control as the extent to which an individual believes that God controls his/her health status (Wallston et al., 1999). This construct is distinct from the general construct of God locus of control, which measures belief in God's control of one's life in general (i.e., not specifically in relation to one's health).

God Locus of Health Control as a Predictor of Health Behaviors

A small amount of research has examined potential associations between God locus of health control and engagement in health behaviors. It is interesting to note that although the amount of research on this topic is limited, a significant portion of this small body of research has examined these constructs specifically among the African American population. This trend of examining African Americans' belief in GLHC in

health-related research may be attributed to the traditional centrality of religion in African American culture and to increased efforts to develop community-based interventions that target the health disparities impacting this population. Polzer and Miles (2005) suggest that because spirituality and religion are commonly and broadly infused in African American life, it is crucial that such concepts be taken into account when considering the health and health management of African Americans.

In a qualitative study involving African Americans living with diabetes, Polzer and Miles (2005) examined if certain religious and spiritual beliefs and practices interacted with diabetes management. These authors distinguished between the perspectives of *turning to God* versus *turning it over to God* in the context of diabetes management, indicating "most African Americans turn to God when they use their spirituality as a source of support in managing their illness" but that "African Americans who turn toward God also [typically] believe that individuals have some responsibility in managing their health care" (pp. 236-237). This practice of turning to God is differentiated from the idea of *turning it over to God*:

> Some African Americans, although they turn to God to give them the support they need, may also, at times, turn it over to God. In other words, they may partially or wholly relinquish control of their health care to God, the ultimate controller. For some individuals this can mean not following recommendations as set forth by health care providers. For persons with diabetes, this can increase the risk of complications and mortality from this illness. (p. 236)

These authors believed that among African Americans, those most likely to turn their health over to God are individuals who are low-income, less educated, members of fundamentalist Christian faiths, elderly, and living in the southern United States (Polzer & Miles, 2005).

Similarly, a small qualitative study by Holt and McClure (2006) examined the perceptions of the religiosity-health connection among African American church members. These authors reported that the notion of the body as a temple of God was often mentioned in support for taking care of oneself. Interestingly, however, the authors point out that nearly everyone who referenced this idea of the body as a temple did so in relation to abstaining from health risk behaviors such as alcohol, tobacco, and drug use, or pre-/extramarital sex, rather than in relation to supporting engagement in preventative health behaviors such as healthy eating. The authors also reported that participants spoke of giving one's health problems up to God not as a form of passivity but rather as an act of putting problems in God's hands once people have already done all that they can do. Holt and McClure describe the importance of spiritual health as a form of coping with illness but also describe a specific perspective that is highly relevant to the concept of God locus of health control:

> Spiritual health could also account for the proportion of religious people who rely on God to heal them (e.g., if their faith is strong enough) and either refuse treatment or refuse to take what the medical community sees as proactive steps to protect their health, such as getting routine screenings. Although none of the participants in this study espoused this belief, some acknowledged that they knew people who did. This type of behavior, and the rationale underlying it, is poorly understood and is a potentially important area of further exploration. (p. 278)

Some quantitative studies have also examined potential associations between God locus of health control (or a closely related variable) and health behaviors, such as diabetes management, preventative cancer screenings, healthy eating behaviors, and physical activity. A number of these studies suggest that having a high God locus of health control may be negatively associated with engagement in health behaviors. An example of such a finding comes from a study involving patients from a hospital/health

clinic that serves mostly uninsured individuals with low-income and low-educational backgrounds. Diabetes management was examined among a sample of patients with type 2 diabetes, the majority of whom were African American. One of the findings was that endorsing a high God locus of health control was associated with higher HbA1c (i.e., an indicator of inadequate blood sugar management), suggesting that individuals who strongly believed that God controlled their health exhibited poorer diabetes management. This trend was particularly significant for individuals who endorsed a low *internal* health locus of control in addition to a high God locus of health control; thus, the authors concluded that the association between belief that God controls one's health and poor treatment adherence may be particularly present for individuals who feel that they are not personally responsible for their own health outcomes (O'hea et al., 2005).

Multiple studies involving God locus of health control (or a similar construct) have focused on cancer screening behaviors. Among a sample of over 300 men of African descent who were 50 to 70 years old, God control was found to be negatively associated with prostate screening behavior (Leaks, 2009). Similarly, in a small study of 52 African American women in rural Louisiana who were at high-risk for breast cancer, findings suggested that high endorsement of God locus of health control was associated with decreased seeking of clinical breast examinations and mammography (Kinney, Emery, Dudley, & Croyle, 2002). Another study examined the relationships among spiritual health locus of control, breast cancer beliefs, and mammography utilization among African American women living in an urban area. Results from this study suggested that *active spirituality health locus of control* (e.g., if I lead a good spiritual life, I will stay healthy) was positively associated with perceived barriers to

mammography and negatively associated with perceived benefits of mammography (Holt, Clark, Kreuter, & Rubio, 2003), suggesting that African American women who endorse a high spirituality health locus of control may be less likely to seek mammography.

Other studies suggest a positive association or a lack of association between God locus of health control (or a closely related construct) and health behaviors. For example, in a study involving a national sample of Presbyterian adults, God locus of health control was not found to be significantly associated with cholesterol screenings, flu shots, nor colonoscopy (i.e., preventive health behaviors; Reindl Benjamins et al., 2011). On the other hand, a two-sample study with college students that measured both God locus of control and God locus of *health* control found that God locus of control positively predicted health habits in both samples and that God locus of *health* control positively predicted health habits in only one of the two samples. It is important to note that the *health habits* construct used in the study was operationalized to include both physical and psychological health components (Welton et al., 1996). Finally, in a study of 100 African American adults living in a small city in the Midwest, God health control was positively associated with engagement in a *health promoting lifestyle* (a construct which is based on a combination of measures of interpersonal relationships, stress management, spiritual growth, nutrition, health responsibility, and physical activity). However, when these constructs were analyzed separately, God locus of health control was not correlated with nutrition behaviors, physical activity, nor health responsibility (Gonnerman, Lutz, Yehieli, & Meisinger, 2008).

Thus, the findings are mixed with regard to the associations between God locus of health control and health behaviors. Additionally, it is interesting to note that the instances in which positive associations with God locus of health control were found occurred when health behaviors/healthy lifestyle was operationalized to include psychological components (e.g., stress management). As aptly stated by Reindl Benjamins and colleagues (2011), “due to differences in measurement strategies, sample, and outcomes examined, the findings to date [on the relationship between God locus of control and health/health behaviors] are complex and defy easy summary” (p. 466).

The Present Study

The present study utilized a single time-point survey design to collect information on religious beliefs, healthy eating behaviors, and demographic characteristics from a community-based sample of adult men who identify as Black. The general purpose of the present study was to examine the relationships among God locus of health control (GLHC), dimensions of religiosity and spirituality (i.e., organizational religiousness, private religious practices, religious coping, and daily spiritual experiences), and healthy eating within a sample of Black men. The primary specific purpose of the present study was to examine the construct of God locus of health control as a potential moderator of the relationships between religiosity/spirituality and engagement in healthy eating [i.e., to examine GLHC as a potential moderator of the relationship between (a) organizational religiousness and healthy eating, (b) private religious practices and healthy eating, (c) religious coping and healthy eating, and (d) daily spiritual experiences and healthy eating].

Religiosity and spirituality were conceptualized multidimensionally, as has been recommended (e.g., Idler et al., 2003, Seybold & Hill, 2001). Multidimensional measurement of religiosity and spirituality is in contrast to the historically more common approach of measuring only one aspect of religiosity or spirituality using a single-item (e.g., frequency of attendance at religious services). God locus of health control was conceptualized according to Wallston and colleagues' (1999) perception of GLHC as the extent to which an individual believes that one's health is controlled by God.

Research Questions

The following research questions were explored:

Research Question 1: Does engagement in healthy eating vary in association with age, education, and/or income?

Research Question 2: Does degree of belief in God locus of health control vary in association with age, education, and/or income?

Research Question 3: Are the four dimensions of religiosity/spirituality assessed in this study (i.e., organizational religiousness, private religious practices, religious coping, and daily spiritual experiences) significantly associated with healthy eating?

Hypotheses

Additionally, the following hypotheses were tested:

Hypothesis 1: It is hypothesized that when controlling for age, education, and income, God locus of health control will have a significant negative association with healthy eating.

Hypothesis 2: It is hypothesized that when controlling for age, education, and income, God locus of health control (GLHC) will moderate the relationships between dimensions of religiosity/spirituality (i.e., organizational religiousness, private religious practices, religious coping, and daily spiritual practices) and healthy eating. Specifically, it is hypothesized that there will be (a) a negative relationship between healthy eating and each dimension of religiosity/spirituality among men who ascribe to a high GLHC, and (b) a positive relationship between healthy eating and each dimension of religiosity/spirituality among men who ascribe to a low GLHC.

CHAPTER 3
RESEARCH METHODOLOGY

Participants

Participant data used in the present study was collected as part of a larger study titled The Black Men's Health Promoting Behaviors Study, the purpose of which was to assess psychosocial variables (e.g., motivators, barriers, cultural values) that may affect engagement in healthy eating behaviors and prostate cancer screening behaviors among Black men. The Black Men's Health Promoting Behaviors Study was funded by the study's two Principal Investigators, Dr. Carolyn Tucker and Dr. Folake Odedina, of the University of Florida.

The participants in the present study were Black males living within one or the other of two cities in Northeast and North-Central Florida. Participant inclusion criteria were as follows: (a) self-identifies as a Black male, (b) is 21 years of age or older, and (c) understands English. Participants were recruited at various community sites and venues, such as health fairs, conferences/meetings, and community centers where Black men were expected to be well-represented. A total of 150 participants who met participant inclusion criteria completed the assessment battery (AB) for this study. Of these 150 participants, the data of nine participants were not included in the data analyses due to missing responses for more than 20% of the items of any given variable of study (i.e., excluding demographic variables); additionally, one participant's data was dropped due to being a significant outlier.

Thus, data from 140 participants were analyzed in this study. Participants ranged in age from 21 to 82 years old (M = 47.75, SD = 12.23, Mdn = 49.00). All participants identified as being Black (an inclusion criteria for the study). With regard to ethnicity,

85% identified as “African American of American origin (born and grew up in America),” 10% identified as “African”, approximately 3% identified as “African American of Caribbean origin (born in one of the Caribbean islands but now an American citizen)”, and approximately 3% identified with another ethnic description.

Education was operationalized as highest level of education achieved. This was a highly-educated sample, in that approximately 31% of participants reported completing graduate school, 29% completed college, 25% completed some college or technical school, 13% completed high school or GED, and less than 2% did not report their education. With regard to employment status, approximately 61% of participants reported working full-time, 16% do not work (e.g., retired, disability), 11% work part-time, 10% were currently unemployed but looking for a job, and 2% did not report their employment status.

Income range was operationalized as annual combined household income. The median annual household income range reported was $50,000 to $59,000. When collapsing some of the income ranges together, approximately 19% of respondents reported a household income below $30,000; 23% reported a household income between $30,000 and $50,000; 21% reported a household income between $50,000 to $70,000; 19% reported a household income between $80,000 to $100,000; and 15% reported a household income over $100,000. Approximately 3% did not report their income range.

In terms of relationship status, approximately 61% of respondents reported being married and living with their spouse; while 17% were single, living without a partner; 10% were single, living with a partner; 8% were divorced or separated; 2% were

married, not living with their spouse; and less than 2% were widowed. The majority of respondents (74%) reported living in an urban area (i.e., a city), while 24% reported living in a rural area, and less than 2% did not provide this information.

With regard to religiosity and spirituality, 40% of respondents self-identified as "moderately religious," 37% identified as "very religious," 14% identified as "slightly religious," and 8% identified as "not religious at all." On the other hand, 56% identified as "very spiritual", 36% identified as "moderately spiritual," 6% identified as "slightly spiritual," and less than 1% identified as "not spiritual at all." Graphical representations of the levels of religiosity and spirituality endorsed by participants in this sample can be seen in Figure 3-1.

Measures

Participants were asked to complete an assessment battery that consisted of a series of psychosocial and health-related questionnaires as well as a demographic data questionnaire. The measures used include full scales or subscales of the following: (1) the God Locus of Health Control scale, (2) the Brief Multidimensional Measure of Religiousness/Spirituality, (3) the Health Promoting Lifestyle Profile-II, and (4) the Eating Behavior Patterns Questionnaire. Below are descriptions of these measures.

Demographic Data Questionnaire

The demographic data questionnaire (DDQ) is a researcher-constructed assessment designed to gather demographic and basic health information from participants in the present study. The DDQ assesses self-report information on demographic variables such as education level, annual household income, marital status, gender, age, and ethnicity.

God Locus of Health Control Scale

The God Locus of Health Control scale (GLHC scale; Wallston et al., 1999) is used to assess the extent of an individual's belief that God controls his or her health status. According to its authors, the GLHC scale can be used to assess either (a) the belief that God is the locus of control for one's health (generally) or (b) the belief that God is the locus of control for a specific disease/health condition, which can be achieved with a slight alteration of wording (Wallston et al., 1999). In the proposed study, the GLHC scale will be used to assess the degree to which one believes that God is in control of one's (general) health. Developed as the most recent addition to the Multidimensional Health Locus of Control (MHLC) scales by Kenneth A. Wallston and colleagues, the GLHC scale was developed to be used either in conjunction with the other MHLC scales or as a stand-alone measure; in the proposed study, it will be used as a stand-alone measure. Support for the use of GLHC as a separate dimension of external locus of control has been reported (Chaplin et al., 2001).

A detailed discussion on the validity of the MHLC scales is available (see Wallston, 2005). Wallston and colleagues (1999) examined the validity of the GLHC measure in a multi-sample study of persons with one of two specific chronic diseases (e.g., rheumatoid arthritis); in the study, authors reported finding (a) positive correlations (r = .29 and .32) between the GLHC scores and ratings of importance of religion, (b) modest positive correlations (r = .20 to .22) between GLHC scores and the Other People dimension of the MLHC but no significant correlations with the Internal or Doctors (locus of control) dimensions, and (c) positive correlations (r = .42 and .47) between GLHC scores and scores on a religious coping measure. Additionally, with

regard to discriminant validity, scores on the GLHC did not correlate with gender, income, or degree of physical disability.

Responses to the 6-item GLHC scale are provided using a 6-point Likert scale ranging from *strongly disagree =1* to *strongly agree =6*; higher scores represent higher belief that God is the locus of control for one's health. An example item is "Most things that affect my health happen because of God." The internal consistency of the GLHC scale has been reported to be .93 among a sample of racially diverse college students (Masters & Wallston, 2005) and .88 among a community-based sample of ethnically diverse women (Chaplin et al., 2001). Cronbach's alpha within this community-based sample of Black men was also .88.

Brief Multidimensional Measure of Religiousness/Spirituality

The Brief Multidimensional Measure of Religiousness/Spirituality (BMMRS; Fetzer Institute, 1999) assesses various domains of religious and spiritual experience. Contributing authors state that the measure "is not intended to be a comprehensive measure of all aspects of religion and spirituality; it has the limited goal of assessing aspects of those phenomena that may bear some relationship to health" (Idler et al., 2003, p. 356). The following four subscales of the BMMRS were used in this study: Daily Spiritual Experiences, Private Religious Practices, Organizational Religiousness, and Religious Coping. Daily Spiritual Experiences measures the perception of interaction with or involvement of God/the transcendent in daily life experiences. Private Religious Practices measures non-organizational/non-institutional religious/spiritual practices. Organizational Religiousness measures involvement with a formal public religious institution/place of worship (Fetzer Institute, 1999). Religious Coping is operationalized as the extent to which one involves religion in understanding or dealing

with stressful situations. Although both the 3-item Positive Religious/Spiritual Coping subscale and the 1-item Overall Religious Coping item were administered, the Overall Religious Coping item was chosen for use in analyses because it was less highly correlated with the other three BMMRS subscales (and therefore, exhibited less potential for issues with multicollinearity) and also because it appears to capture a more general and distinct religious coping construct.

Responses to items on the BMMRS are provided using a Likert scale, with the number of response choices varying by subscale from four options to eight options. For example, the Private Religious Practices subscale uses an 8-point response scale ranging from *never* to *more than once a day.* An example item from this subscale is "How often do you read the Bible or other religious literature?" On the other hand, the Daily Spiritual Experiences subscale uses a 6-point response scale ranging from *never or almost never* to *many times a day*. An example item is "I feel God's presence."

Discriminant validity of the items on this measure was assessed via a correlation matrix including all items and all factors/indices (see Idler et al., 2003). Responses from this measure collected as part of the 1998 General Social Survey (GSS) of the University of Chicago National Opinion Research Center (i.e., a nationally representative household survey) were utilized in a factor analysis, and convergent validity was established via correlations against a set of previously validated religion items from the GSS. Furthermore, Neff (2006) examined the reliability and validity of the complete BMMRS and determined that despite small differences in factor loadings in association with race/ethnicity, the measure appeared to be useful in research with African American participants as well as non-Hispanic White American participants.

Reported Cronbach's alphas are .91 [Daily Spiritual Experiences], .72 [Private Religious Activities], and .82 [Organizational Religiousness] (Idler et al., 2003). Cronbach's alphas within the present sample—similar to reported values—were .87 [Daily Spiritual Experiences], .80 [Private Religious Activities], and .84 [Organizational Religiousness].

Measures of Healthy Eating

Due to the difficulty in measuring self-reported healthy eating behaviors while avoiding time-intensive measurements, two measures of healthy eating were used. These measures were the Nutrition subscale of the Health Promoting Lifestyles Profile-II (HPLP-II; Walker & Hill-Polerecky, 1996; Walker, Sechrist, & Pender, 1987) and the Low-Fat Eating subscale of the Eating Behavior Patterns Questionnaire (EBPQ; Schlundt, Hargreaves, & Buchowski, 2003). A description of each measure follows.

The Health-Promoting Lifestyle Profile II

The Health-Promoting Lifestyle Profile II (HPLP-II; Walker & Hill-Polerecky, 1996; Walker, Sechrist, & Pender, 1987) assesses self-reported engagement in a health-promoting lifestyle. Although the 52-item HPLP-II has six subscales, only the 9-item Nutrition subscale was used in the present study, as a measure of healthy eating behaviors. An example item on this subscale is, “How often do you limit use of sugar and food containing sugar?” Responses to items on the HPLP-II are made using a 4-point Likert scale ranging from *never =1* to *routinely =4*. Reported Cronbach’s alphas for the HPLP-II are .943 for the total scale and .757 for the Nutrition subscale. Reported 3-week test-retest stability for the total scale is .892. Authors of the HPLP-II report that construct validity of this measure was supported by a factor analysis and that its criterion-related validity was indicated by significant correlations (.269 to .491) between

the HPLP-II and measures of perceived health status and quality of life (Walker & Hill-Polerecky, 1996).

In order to obtain information on three additional eating behaviors that are significant with regard to health promotion/disease prevention (i.e., sodium intake, eating whole grains, and drinking sugary drinks) but are not directly assessed by this subscale, three additional items were included for the purposes of this study, using wording and sentence structure similar to the measure's existing items. Prior to running analyses with this slightly modified version of the HPLP-II, bivariate correlations were conducted with participants' mean scores on the measure with and without the three additional items. The 9-item and 12-item versions of the measure were extremely highly correlated (r = .96), as would be expected. Cronbach's alphas were calculated for both versions; the 12-items demonstrated a slightly higher internal reliability (.81) than the 9-items (.79).

Eating Behavior Patterns Questionnaire

The Eating Behavior Patterns Questionnaire (EBPQ; Schlundt, Hargreaves, & Buchowski, 2003) assesses self-reported prevalence of various eating behaviors. Although the scale is comprised of six subscales, only the Low-Fat Eating subscale (14 items) was used in the present study; this subscale was utilized as a second measure of healthy eating behaviors (i.e., in addition to the HPLP-II). This subscale lists various low-fat eating behaviors (e.g., "I carefully watch the portion sizes of my foods") and asks respondents to what degree they agree with each behavior. Responses are provided on a 5-point Likert scale that ranges from *strongly disagree = 1* to *strongly agree = 5*. Thus, higher scores indicate higher reported engagement in low-fat eating behaviors.

The EBPQ was specifically developed for use with African American women and was validated with samples of African American women of diverse socioeconomic backgrounds who reside in the Southern United States. Unfortunately, there is a scarcity of published research that has used this measure with Black men. However, Cronbach's alpha for this subscale in the present sample of Black men (α = .82) was quite close to the value reported in the validation study involving a sample of African American women (α = .84).

Authors of the EBPQ report that the Low-Fat Eating subscale and the other subscales of the EBPQ were determined based on the factor outcomes of a factor analysis. Construct validation was determined through the examination of correlations of participants' responses on the EBPQ with their responses on (a) a food frequency questionnaire and (b) the Eating Styles Questionnaire (which measures eating behaviors that reduce fat intake; Hargreaves et al., 1999). Scores from the Low-Fat Eating subscale of the EBPQ have been reported to have a significant positive correlation with eating behaviors that reduce fat intake (r = .65) and a significant negative correlation with total fat intake (r = -.37), saturated fat intake, (r = -.37), and percentage of energy from fat (r = -.50; Schlundt et al., 2003). To make the EBPQ less focused on ideas and behaviors that may potentially be considered more traditionally feminine (e.g., counting fat grams, using recipes), a few minor wording changes were made (e.g., removing "in recipes" from "I reduce fat in recipes by substituting ingredients and cutting portions"), given that the present study involved an all-male sample.

Procedure

The University's Institutional Review Board approved the larger study of which this study is a part. The procedures of this study consisted of (a) recruitment and (b) a single data collection via completion of an assessment battery. Recruitment was conducted via *tabling* (i.e., setting up an informational booth and speaking with potential participants) at events targeted toward African American or Black men, such as health fairs in predominantly African American/Black communities and meetings of organizations comprised of African American/Black men.

Recruiters at each recruitment site were one of the principal investigators, a trained researcher (i.e., graduate student or post-doctoral researcher), and/or a trained research assistant (i.e., undergraduate student). Prior to serving as recruiters for the proposed study, all persons were trained in the procedures of the study and in the implementation of ethical and culturally sensitive research. Recruiters informed potential participants that the purpose of the study is to find effective ways to promote health and prevent disease among African American and Black men. These potential participants were asked if they met inclusion criteria and if so, were invited to participate in the study. They were informed that participating in the study involves completing a questionnaire packet on-site that requires approximately 25 minutes to complete and that their responses would be anonymous (i.e., their name would not be written on their questionnaires). Potential participants were also informed that they would be given either a $10 gift card or an item of equal or greater value (e.g., a custom T-shirt) for their participation in the study and were specifically informed which compensation options were available prior to choosing whether or not to participate.

Men who agreed to participate were provided an informed consent letter that further explained the study (i.e., the purpose of the study, inclusion criteria, participation procedures, compensation) and were shown the assessment battery (AB). A recruiter provided each participant with an AB to complete prior to leaving the event and invited the participant to ask questions and to inform the recruiter if he would prefer to have the questionnaire packet read to him. Participants were given up to two hours to complete the AB on-site, although it was previously observed that male students could complete this AB within approximately 25 minutes or less. Upon returning a completed AB to the recruiter, participants were provided the agreed upon compensation and thanked for their involvement in the study. Data was collected over approximately a 1.5-year period, depending on when certain community events occurred.

Given the nature of the study, the Institutional Review Board approved for the consent form to not require participants' names or signatures. Participants' names were not collected in any way in the case of individuals who chose a material compensation (e.g., a T-shirt). Participants who chose to be compensated in the form of a gift card were asked to print and sign their name on a receipt and payment log. After completion, these documents and the AB were stored in a locked room within the Psychology Department of the host institution. Participant names could not be connected with their data in any way, given that no identifying information was recorded on their AB.

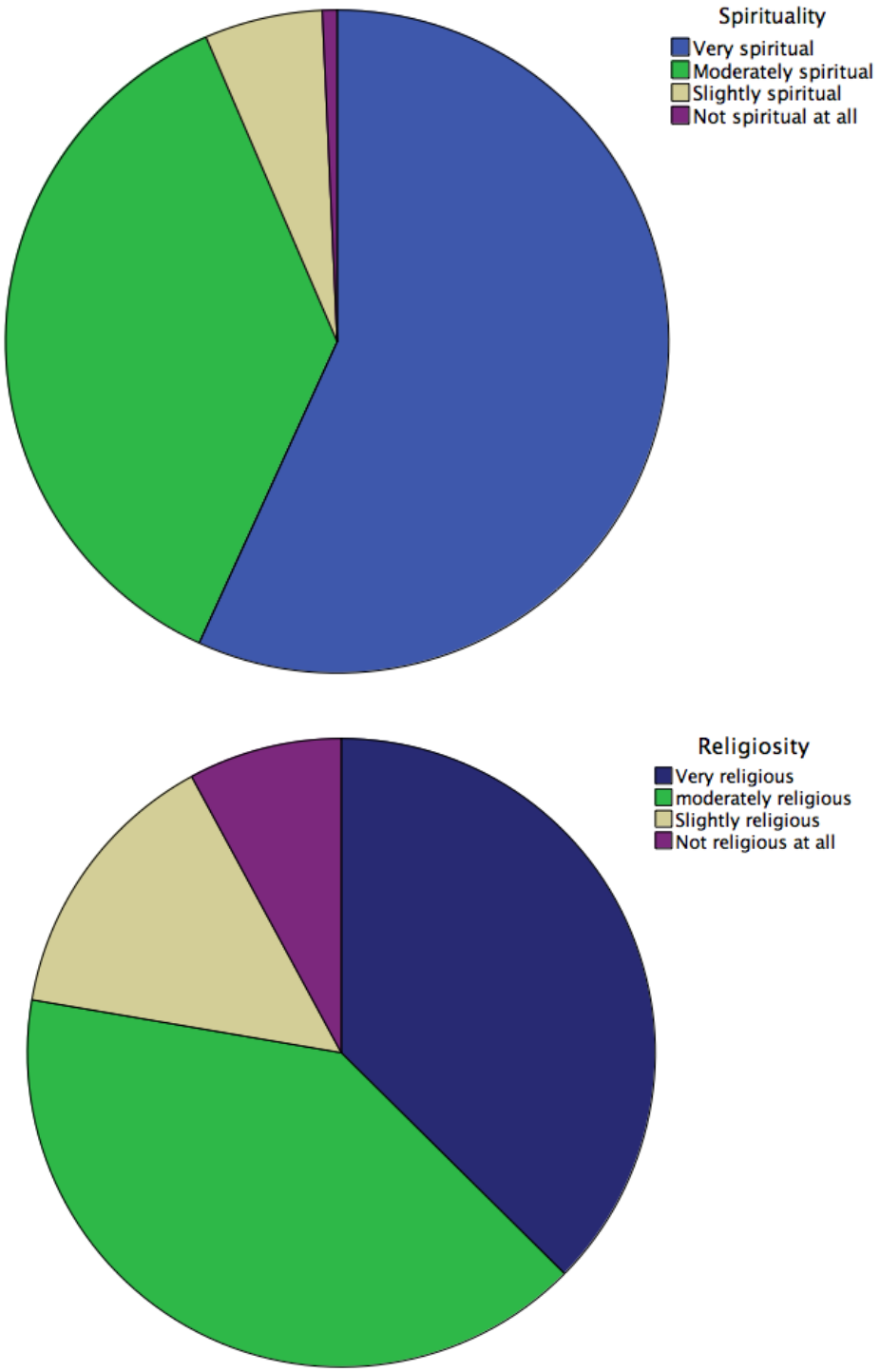

Figure 3-1. Levels of spirituality and religiosity endorsed by study participants.

CHAPTER 4
RESULTS

Preliminary Analyses

Prior to conducting analyses, data were examined for missing responses. All measures in the data set were examined, and cases with missing data within a particular scale or subscale were identified. Person mean substitution (i.e., person-level mean substitution) was used to impute missing scores. In person mean substitution, missing item responses are imputed from the respondent's non-missing items on that scale (Downey & King, 1998). There is evidence to support using this method over listwise deletion or item-level mean substitution for cross-sectional data if half or more of the items of a scale are complete (Hawthorne & Elliott, 2005); nonetheless, given that as a result of this method, inter-item correlations become inflated as the number of missing items increase (Downey & King, 1998), imputation was used only for participants whose data was missing no more than 20% of items on a given scale. This proportion (≤ 20%) has been suggested to allow for good estimates of missing data (Downey & King, 1998).

Cases missing responses for more than 20% of items within a scale (i.e., excluding demographic variables) were dropped from the data set (n = 9). Of the remaining participants, less than 10% of participants (n = 13) had one or more missing items on any of the subscales of the variables of study (i.e., excluding demographic variables). For the three demographic (i.e., single-item) variables used as covariates in the analyses (i.e., age, income, education level), mean-level substitution was utilized to impute missing data; less than 10% of data was imputed for each of these variables.

In addition to checking data for missing item responses, study variables were evaluated for univariate normality and multicollinearity. Bivariate correlations were conducted with all variables of interest to assess for multicollinearity among variables (i.e., variables being so highly related that they are essentially redundant; Weston & Gore, 2006). None of the correlations appeared problematic with regard to multicollinearity (i.e., *r*s > .85; Kline, 2005). However, to reduce the possibility of problems arising from multicollinearity, scale scores were centered. In order to prepare the data for moderation analyses, interactions terms were created with God locus of health control (GLHC) and each of the four religiosity dimensions (e.g., GLHC x Religious Coping). Again, to reduce the threat of multicollinearity, these four newly created variables were centered as well.

To assess univariate normality, histograms of each variable were visually inspected, and skewness and kurtosis values were evaluated. Additionally, Mahalanobis distances were calculated in AMOS 18.0 (Arbuckle, 2006) to identify multivariate outliers and assess their effect on departures from multivariate normality (Gao, Mokhtarian, & Johnston, 2008). One multivariate outlier (i.e., one case) was deleted due to it having a particularly large effect on both the univariate kurtosis of one variable and the multivariate kurtosis, as assessed by Mardia's coefficient (Mardia, 1970). After this outlier was deleted, distributions of all variables met guidelines for univariate normality (i.e., skewness indices ≤ 3, kurtosis indices ≤ 10; Chou & Bentler, 1995; Kline, 2005). With regard to multivariate normality, Mardia's multivariate kurtosis was 47.67 (i.e., above the critical value), and five participants emerged as multivariate outliers with Mahalanobis distances significant at $p < .001$. Upon visual inspection of the data,

however, it appeared that none of these participant outliers demonstrated patterns of intentional or consistent extreme responding (e.g., marking all “1’s” on all items). The model was tested with no additional cases deleted, given that (a) parameter estimates tend to remain valid under reasonable assumptions even when the data are nonnormal (McDonald & Ho, 2002), (b) testing assumptions for multivariate normality is typically impractical (Weston & Gore, 2006), (c) deletion of outliers until multivariate normality is reached may be undesirable due to loss of information and power (Gao et al., 2008), and (d) tests of univariate normality in the current sample provided acceptable results.

Although the size of the final sample with which primary analyses were run (*n* = 140) is smaller than the commonly reported sample size guideline for structural equation modeling (SEM) of at least 200 cases (Weston & Gore, 2006), the size of the current sample does meet other documented guidelines of 5 to 10 participants per observed indicator (Bryant & Yarnold, 1995). Additionally, it has been noted that sample size with regard to SEM is one of the multiple SEM-related issues in which there is no consensus, and adequate sample size determination depends on a number of factors (Weston & Gore, 2006). For example, MacCallum and colleagues (1996) indicated that a smaller minimum sample size is necessary if less power is required, if a researcher is testing for close fit versus exact fit, and if the model has less complexity. Given that this study is preliminary in nature and entails a low-complexity model with only one latent-modeled variable, the current sample size was judged to be adequate. Additionally, the present sample fits within recommendations by Lei and Lomax (2009) that a sample size of more than 100 should be used in order to obtain more accurate and less biased parameter estimates.

Bivariate Correlations

Bivariate correlations and descriptive statistics for the sample's scores on all variables of interest are presented in Table 4-1. As would be expected, the four examined dimensions of religiosity/spirituality (i.e., subscales of the Brief Multidimensional Measure of Religiosity and Spirituality [BMMRS]) were significantly correlated with each other; that is, Daily Spiritual Experiences (DSE), Private Religious Practices (PRP), Organizational Religiousness (OR), and Religious Coping (Cope) were all significantly correlated ($p < .01$), with rs ranging from .44 to .66, demonstrating medium to large effect sizes (Sink & Stroh, 2006). Despite these significant correlations, none of these variables were so highly correlated as to be problematic with regard to multicollinearity (i.e., $r > .85$; Kline, 2005)].

God Locus of Health Control (GLHC) demonstrated a significant positive correlation with Organized Religiousness ($r = .18$, $p < .05$), but did not correlate with any of the other three religiosity/spirituality dimensions. GLHC was negatively correlated with both measures of healthy eating behaviors [i.e., the Nutrition subscale of the Health Promoting Lifestyles Profile (HPLP), $r = -.18$, $p < .05$, and the Low-Fat Eating subscale of the Eating Behavior Patterns Questionnaire (EBPQ), $r = -.22$, $p = .01$], suggesting that higher beliefs that God controls one's health is associated with lower engagement in healthy eating/low-fat eating behaviors. These significant relationships with GLHC demonstrated small effect sizes (Sink & Stroh, 2006). Of the four religiosity/spirituality dimensions, only Daily Spiritual Experiences correlated with one of the healthy eating measures (i.e., EBPQ; $r = .19$, $p < .05$), and this was a small positive correlation (Sink & Stroh, 2006).

With regard to the three demographic variables (i.e., age, education level, income), neither age nor income level correlated with any of the religiosity variables; however, education level correlated negatively with Private Religious Practices and Religious Coping, $p < .05$, with *r*s of -.19 and -.18 (small effect sizes; Sink & Stroh, 2006). Conversely, education level did not correlate with Daily Spiritual Experiences or Organizational Religiousness. Of the three demographic variables, age demonstrated a positive association with low-fat eating (EBPQ), $p < .01$ (i.e., increased age was associated with increased engagement in low-fat eating practices), and education level demonstrated a positive association with nutrition (HPLP), $p < .05$ (i.e., increased education was associated with increased engagement in healthy eating behaviors), with *r*s of .28 and .18 (small effect sizes; Sink & Stroh, 2006).

GLHC Scores

The mean total score of the God Locus of Health Control scale (GLHC) was 17.3 (*SD* = 8.7), which indicates that on average, participants slightly disagreed with the statements about God controlling their health. However, the most frequently occurring score was 6, indicating strong disagreement with God's controlling one's health. In fact 17-22% of the sample strongly disagreed that God controls one's health. However, there was considerable variation within the sample, with total scores covering the entire range of possible scores, from 6 to 36. When scores were divided into four categories to estimate frequencies of opinions, it appeared that approximately 58% of the sample expressed disagreement with GLHC, 11% expressed relatively neutral responses, 16% slightly-to-moderately agreed with GLHC, and 14% expressed strong agreement with GLHC. Thus, overall, approximately 30% of the sample expressed some degree of positive endorsement of GLHC.

Mean endorsement of GLHC by participants in this study is considerably lower as compared to some other studies examining GLHC among African American or Black adults (e.g., Kinney et al., 2002; Lutz, Yehieli, & Gonnerman, 2004). For example, a small study of African American females in rural Louisiana reported an average GLHC score of 26 (Kinney et al., 2002). Additionally, a study by Lutz and colleagues (2004) that involved a sample of Black and/or African American males and females living in Iowa who predominantly reported frequent church attendance found a mean GLHC score of 26.7 total and 26.0 for men only (as opposed to 17.3 in the present study). Although the scores from the Lutz et al. study cannot be considered an exact comparison because a different measure of God locus of health control was used [i.e., the God Control Scale (Welton et al., 1996) vs. the God Health Locus of Control scale (Wallston et al., 1999) used in the present study], both measures use the same 6-point response scale and are 6-item scales with similar items.

Reasons for the comparatively lower mean GLHC score in this sample as compared to these reference samples are unknown. However, in comparing these two studies with the present study, it is important to take into account substantial differences in sample demographics. For example, despite the similar racial/ethnic make-up of the sample from the Lutz et al. study and the sample from the present study, the majority (53%) of respondents in the Lutz et al. study reported an annual household income of less than $15,000, whereas the median annual household income range reported in the present study was $50,000 to $59,000. Additionally, 66% of respondents in the reference study completed at least some college or technical school (Lutz et al., 2004),

whereas 85% of the present sample completed at least this level of education, and participants in these two studies lived in different areas of the country (Iowa vs. Florida).

Results for the Research Questions

Research Question 1

Research Question 1: Does engagement in healthy eating vary in association with age, education, and/or income? To examine this research question, two simultaneous multiple linear regressions were performed in which the predictor variables were age, education, and income, and the criterion variable was one of the two measures of healthy eating. In the first multiple regression, the Low-Fat Eating subscale of the Eating Behavior Patterns Questionnaire (EBPQ) was the criterion variable, and in the second multiple regression, the Nutrition subscale of the Health Promoting Lifestyles Profile-II (HPLP) was the criterion variable. Results of the regression equations (Table 4-2) indicated that age accounted for unique positive variance in low-fat eating ($\beta = .27$, $p < .01$), but income and education were not associated with low-fat eating. The overall model of age, education, and income as predictors of low-fat eating was significant, $F(3, 139) = 3.69$, $p < .05$, with 8% of total variance explained (a medium effect size; Sink & Stroh, 2006). Conversely, in the second multiple regression, none of the three demographic variables accounted for unique variance in nutritious eating as measured by HPLP.

Research Question 2

Research Question 2: Does degree of belief in God locus of health control (GLHC) vary in association with age, education, and/or income? To examine this research question, a simultaneous multiple regression was performed in which the predictor variables were age, education, and income, and the criterion variable was

GLHC. Results of the regression equation (Table 4-3) indicated that none of these three demographic variables contributed unique variance in God locus of health control. In each of the previously mentioned analyses, collinearity statistics (i.e., VIF and tolerance statistics) were within recommended limits (Field, 2005), suggesting that multicollinearity was not a concern.

Research Question 3

Research Question 3: Are the four dimensions of religiosity/spirituality examined in this study (i.e., organizational religiousness, private religious practices, religious coping, and daily spiritual experiences) significantly associated with healthy eating? To examine this research question, two simultaneous linear regressions were conducted with the four religiosity/spirituality dimensions as the predictor variables and healthy eating as the criterion variable. In one of the regressions, healthy eating was operationalized with the EBPQ subscale, and in the other regression, healthy eating was operationalized with the HPLP subscale. Collinearity statistics did not suggest cause for significant concern regarding multicollinearity (Field, 2005).

For the regression in which healthy eating was operationalized using HPLP, daily spiritual experiences (DSE) was the only one of the four religiosity/spirituality dimensions that accounted for a significant amount of unique variance in nutritious eating ($\beta = .33$, $p < .01$). DSE was positively related to nutritious eating, and in fact, was the only one of the dimensions with a positive B-weight. The overall model (i.e., including all four dimensions) predicted a significant amount of the variance in nutritious eating, $F(4, 135) = 3.13$, $p < .05$, and demonstrated a medium effect size ($R^2 = .09$, Adj. $R^2 = .06$; Sink & Stroh, 2006).

For the regression equation using EBPQ to measure healthy eating (low-fat eating), none of the four religiosity/spirituality dimensions predicted a significant amount of unique variance in low-fat eating. However, the association between daily spiritual experiences and low-fat eating approached significance (β = .20, p = .07). In sum, it appears that overall, of the four examined religiosity/spirituality dimensions, only daily spiritual experiences was significantly associated with healthy eating; in other words, healthy eating was not significantly associated with organizational religiousness, religious coping, nor private religious practices (Table 4-4).

Results for the Hypotheses

Hypothesis 1

Hypothesis 1 stated that when controlling for age, education, and income, God locus of health control (GLHC) would have a significant negative association with healthy eating. To test this hypothesis, two hierarchical linear regressions were conducted with GLHC as the predictor variable; age, education, and income as covariates; and healthy eating as the criterion variable. In one of the regressions, healthy eating was operationalized with the EBPQ subscale, and in the other regression, healthy eating was operationalized with the HPLP subscale.

For both regression equations, collinearity statistics (i.e., VIF and tolerance statistics) were within recommended limits (Field, 2005), suggesting that multicollinearity was not a concern. Results of the regressions suggested partial support for Hypothesis 1 (Table 4-5). For the regression in which healthy eating was operationalized using HPLP, GLHC accounted for unique negative variance in healthy eating (β = -.17, p < .05); however, the overall model with GLHC and the demographic

covariates (i.e., age, income, education) did not predict a significant amount of the variance in healthy eating.

For the regression equation using EBPQ to measure healthy eating, results indicated that GLHC accounted for unique negative variance in healthy eating, above and beyond the effects of age, education, and income (β = -.23, p < .01). In fact, the addition of GLHC resulted in a significant increase in variance explained in healthy eating (i.e., an additional 5% variance) in step 2 of the model as compared with step 1 (demographic variables only). Of the three demographic variables, age explained significant unique variance in healthy eating (β = .29, p < .01) but education and income did not. The overall model with GLHC and the demographic covariates predicted a significant amount of the variance in healthy eating, $F(4, 139) = 5.01$, $p < .01$, and demonstrated a medium effect size (R^2 = .13, Adj. R^2 = .10; Sink & Stroh, 2006). Overall, Hypothesis 1 was partially supported, in that GLHC predicted negative variance in healthy eating when controlling for age, education, and income when healthy eating was operationalized with EBPQ but not when healthy eating was operationalized with HPLP.

Hypothesis 2

Hypothesis 2 stated that after controlling for the effects of demographic variables (age, education, and income), God locus of health control (GLHC) would moderate the relationship between religiosity/spirituality dimensions (i.e., organizational religiousness, private religious practices, religious coping, and daily spiritual practices) and healthy eating. Specifically, it was hypothesized that there would be (a) a significant negative relationship between dimensions of religiosity/spirituality and healthy eating among men who ascribe to a high GLHC, and (b) a significant positive association between

dimensions of religiosity/spirituality and healthy eating among men who ascribe to a low GLHC. To test hypothesis 2, SEM was conducted using AMOS 18.0 (Arbuckle, 2006) with maximum likelihood estimation.

Given the difficulty in measuring engagement in healthy eating behaviors via brief self-report surveys, two measures (i.e., instead of one) were used (i.e., HPLP and EBPQ) in this study. SEM provided a means of determining a single latent “healthy eating” factor from these two measures. Differences in findings from the previously described regression analyses—which examined associations with these two measures of healthy eating separately—also support the use of a single latent “healthy eating” factor, particularly for the purpose of examining this slightly more complex moderation hypothesis.

In addition to the healthy eating factor, the SEM model included the four examined dimensions of religiosity/spirituality, GLHC, and four interaction terms which were created with GLHC and each of the four religiosity/spirituality dimensions (i.e., Religious Coping x GLHC, Organizational Religiousness x GLHC, Private Religious Practices x GLHC, Daily Spiritual Experiences x GLHC). Age, education, and income were included as covariates. Thus, the model included a total of one latent variable (i.e., healthy eating, determined from two measures) and 12 additional observed variables (i.e., four religiosity dimensions, GLHC, four interaction terms, and three demographic variables). See Figure 4-1 for a graphical representation. All of the observed variables (indicators) were centered to reduce multicollinearity.

Taking into account a range of fit indices has been recommended over making a determination of model fit based on nonsignificance of chi-square alone, particularly

given that the chi-square statistic is sensitive to sample size (i.e., small samples may provide less power to determine a model's true lack of fit; Bryant & Yarnold, 1995) and because there is no clear agreement on appropriate sample size nor acceptable fit criteria (Hooper, Coughlan, & Mullen, 2008; Weston & Gore, 2006). Researchers have suggested using the Comparative Fit Index (CFI) over other indices (e.g., chi-square) when the sample size is smaller (Fan, Thompson, & Wang, 1999; Hooper et al., 2008; Lei & Lomax, 2009). The Root Mean Square Error of Approximation (RMSEA; Fan et al., 1999; Hooper et al., 2008) and the Standardized Root Mean Residual (SRMR; Hooper et al., 2008) are also recommended. Thus, in addition to chi-square, these three fit indices (i.e., CFI, RMSEA, and SRMR) were examined for determining model fit.

In deciding which guidelines to use for determining acceptable fit of a model, Weston and Gore (2006) indicated that sample size and model complexity should be considered, applying more stringent criteria for large samples and less stringent criteria for highly complex models. For CFI, criteria for fit range from CFI ≥ .90 to CFI ≥ .95 (Weston & Gore, 2006), and for RMSEA and SRMR, recommended criteria range from RMSEA, SRMR ≤ .10, to RMSEA ≤.08, SRMR ≤ .06 (Hu & Bentler, 1999; Quintana & Maxwell, 1999; Weston & Gore, 2006). Following recommendations to use a two-step procedure for SEM (Kline, 2005; Muthén & Muthén, 2010; Weston & Gore, 2006), the adequacy of the observed indicators (i.e., EBPQ and HPLP) in measuring their latent construct (healthy eating) was first assessed by testing the fit of the measurement model. Next, the structural model was tested in order to evaluate the hypothesized relations.

Measurement model

Fit index values for the measurement model demonstrated adequate fit, $\chi^2(11, N = 140) = 16.57$, $p = .12$, CFI = .99, RMSEA = .06 (90% CI: .00, .12), and SRMR = .03. Additionally, the two indicators (i.e., HPLP and EBPQ) loaded positively and significantly on the latent "healthy eating" construct as would be expected, suggesting that the construct is adequately measured by the two observed variables. Unstandardized and standardized loadings for the measurement model are shown in Table 4-6.

Structural model

Next, the structural model (Figure 4-1) was tested to evaluate the unique relationships of the four religiosity/spirituality dimensions (i.e., organizational religiousness, private religious practices, religious coping, and daily spiritual experiences), GLHC, and the four interaction terms (e.g., Religious Coping x GLHC), with healthy eating, including age, education, and income in order to covary out variance from each of these. Results of structural equation modeling showed that the proposed model yielded adequate fit, $\chi^2(67, N = 140) = 48.07$, $p = .13$, CFI = .98, RMSEA = .04 (90% CI: .00, .08), and SRMR = .07. This model accounted for 28% of the variance in healthy eating.

Main effects. Daily spiritual experiences was positively and uniquely related to healthy eating ($\beta = .30$, $p < .01$). Additionally, GLHC was negatively and uniquely related to healthy eating ($\beta = -.23$, $p < .01$), providing further support for Hypothesis 1. The other three religiosity/spirituality dimensions (i.e., organizational religiousness, religious coping, and private religious practices) did not demonstrate significant associations with healthy eating, although the association between organizational religiousness and healthy eating approached significance ($\beta = -.19$, $p = .08$) and was

negative. All unstandardized and standardized loadings for the hypothesized structural model are shown in Table 4-7.

Interaction effects. Two of the interactions—Religious Coping x GLHC and Private Religious Practices x GLHC—were positively and uniquely related to healthy eating (β = .24, β = .27, respectively; $p < .05$). Additionally, a moderately significant trend was observed in the effect of the Organizational Religiousness x GLHC interaction on healthy eating (β = -.22, p = .059). The Daily Spiritual Experiences x GLHC interaction and healthy eating were not significantly related. Interpreting interaction effects can be particularly challenging, so to assist in decomposing interaction effects, general interpretations were made based on visual examination of graphs by using EBPQ as an approximation of the healthy eating construct and graphing the relationship between healthy eating and the religious dimensions for the lower and upper quartiles of GLHC scores (i.e., the lowest 25% of GLHC scores and the highest 25% of GLHC scores). Alternative visual representations of the interaction effects are also provided by the graphed relationships between healthy eating and GLHC for the lower and upper quartiles of each religiosity dimension.

Religious Coping x GLHC. Examining the graphical representation of the relationship between healthy eating (y-axis) and religious coping (x-axis) for individuals in the lower quartile versus the upper quartile of GLHC, it is apparent that healthy eating and religious coping were inversely related for individuals in the lower quartile of God locus of health control (i.e., healthy eating decreased as engagement in religious coping increased); however, for individuals in the upper quartile of GLHC, healthy eating and religious coping were positively associated (i.e., healthy eating increased as

engagement in religious coping increased; Figure 4-2). Differences in healthy eating between participants in the lower and upper quartiles of GLHC were noticeable for those who engaged in low to moderate religious coping (i.e., those with low GLHC endorsed more healthy eating than those with high GLHC), but no differences were observed for those who engaged in the highest levels of religious coping (i.e., endorsement of healthy eating was about the same for individuals highly engaged in religious coping, regardless of belief in God controlling one's health). At most levels of religious coping, individuals who endorsed lower GLHC reported healthy eating more than individuals who endorsed higher GLHC; however, these differences disappeared at the highest levels of religious coping.

General interpretations of the GLHC x Religious Coping interaction may alternatively be made by observing the graphed relationship between healthy eating and GLHC for participants at higher and lower levels of religious coping (Figure 4-3). Among individuals who endorsed a low to moderate degree of religious coping (i.e., religion is *not involved* in understanding or dealing with stressful situations to religion is *somewhat involved* in understanding or dealing with stressful situations), level of endorsement of GLHC was negatively associated with engagement in healthy eating behaviors (i.e., healthy eating decreased as belief in GLHC increased); however, among individuals who endorsed a *high* degree of religious coping (i.e., religion is *very involved* in understanding or dealing with stressful situations; 59% of the sample), no significant differences were observed in reported healthy eating behaviors in accordance with level of endorsement of GLHC.

Private Religious Practices x GLHC. For individuals in the lower quartile of GLHC, levels of engagement in healthy eating did not appear to vary in association with levels of engagement in private religious practices (PRP); however, for individuals in the upper quartile of GLHC, engagement in healthy eating appears to increase significantly as engagement in PRP increases (Figure 4-4). Differences in healthy eating between participants in the lower and upper quartiles of GLHC were notable for those who endorsed low-to-moderate engagement in PRP (i.e., among individuals who endorsed low-to-moderate engagement in private religious practices, those with low GLHC tended to endorse higher engagement in healthy eating than those with high GLHC) but this difference disappeared at high levels of engagement in PRP.

In an alternative graphical representation, the relationship between healthy eating and GLHC for the lower and upper quartiles of private religious practices (Figure 4-5), it can be observed that among individuals in the lower quartile of reported engagement in private religious practices, level of endorsement of GLHC was negatively associated with engagement in healthy eating behaviors (i.e., healthy eating decreased as belief in GLHC increased); however, among individuals in the upper quartile of engagement in private religious practices, no significant relationship was observed between healthy eating and GLHC.

Summary of results for hypothesis 2

In sum, GLHC was found to moderate the relationship between religiosity/spirituality and healthy eating for two of the four dimensions of religiosity/spirituality (i.e., religious coping and private religious practices). In this sense, Hypothesis 2 was partially supported; however, the specific hypothesized directional relationships were not supported. For these two religiosity/spirituality dimensions,

directions of the relationships among the variables were the opposite of what was hypothesized. In the case of religious coping, individuals with the highest endorsement of GLHC exhibited a positive relationship between engagement in religious coping and engagement in healthy eating; conversely, individuals with the lowest endorsement of GLHC exhibited an inverse relationship between engagement in religious coping and engagement in healthy eating. Similarly, in the case of private religious practices, individuals with the highest endorsement of GLHC exhibited a positive relationship between engagement in religious practices and engagement in healthy eating (i.e., similar to the association found for religious coping); however, for individuals with the lowest endorsement in GLHC, no relationship was found between private religious practices and healthy eating. Individuals least likely to engage in healthy eating behaviors appeared to be those who reported low engagement in religious practices/coping yet endorsed a high level of belief that God controls their health.

Table 4-1. Descriptive statistics and bivariate correlations among the variables of interest.

Variable	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
1. God locus of health control	—	.08	.11	.18*	.09	-.18*	-.22**	.08	-.06	.06
2. Daily spiritual experiences	.08	—	.61**	.44**	.45**	.12	.19*	.02	-.14	-.10
3. Private religious practices	.11	.61**	—	.66**	.52**	-.11	.12	.12	-.19*	-.02
4. Organized religiousness	.18*	.44**	.66**	—	.46**	-.14	-.02	.14	-.09	-.03
5. Religious coping	.09	.45**	.52**	.46**	—	-.10	.03	.02	-.18*	.02
6. Healthy eating (HPLP)	-.18*	.12	-.11	-.14	-.10	—	.53**	.04	.18*	.09
7. Healthy eating (EBPQ)	-.22**	.19*	.12	-.02	.03	.53**	—	.28**	.08	.04
8. Age	.08	.02	.12	.14	.02	.04	.28**	—	.02	.26**
9. Education	-.06	-.14	-.19*	-.09	-.18*	.18*	.08	.02	—	.37**
10. Income	.06	-.10	-.02	-.03	.02	.09	.04	.26**	.37**	—
M	17.26	29.86	29.61	8.44	3.41	2.48	45.31			
SD	8.67	4.99	7.61	2.74	.82	.50	8.94			
Possible Range	6 - 36	6 - 36	5 - 40	2 - 12	1 - 4	1 - 4	14 - 0			

Note. Higher scores indicate higher levels of the variables assessed. HPLP = Health Promoting Lifestyle Profile-II; EBPQ = Eating Behavior Patterns Questionnaire. *$p < .05$; **$p \leq .01$.

Table 4-2. Relations of demographic variables with healthy eating measures.

	B	*SE B*	β	R^2	Adj. R^2	*F*	*df*
			HPLP Regressed onto Demographic Variables				
				.03	.01	1.45	3, 139
Constant	2.01	0.27					
Education	0.08	0.04	.16				
Age	0.00	0.00	.03				
Income	0.00	0.02	.02				
			EBPQ Regressed onto Demographic Variables				
				.08	.06	3.69*	3, 139
Constant	32.54	4.63					
Education	0.83	0.77	.10				
Age	0.21	0.07	.27**				
Income	-0.19	0.27	-.06				

Note. * $p < .05$; ** $p < .01$.

Table 4-3. Relations of demographic variables with God locus of health control.

	B	*SE B*	β	R^2	Adj. R^2	*F*	*df*
				.02	-.01	0.70	3, 139
Constant	17.14	4.63					
Education	-0.74	0.77	-.09				
Age	0.05	0.07	.06				
Income	0.23	0.27	.08				

Note. No significance at $p < .05$.

Table 4-4. Relations of religiosity/spirituality dimensions and healthy eating.

	B	*SE B*	β	R^2	Adj. R^2	*F*	*df*
Religiosity/Spirituality Dimensions Regressed onto HPLP							
Model				.09	.06	3.13*	4, 135
Constant	-0.01	0.04					
DSE	0.03	0.01	.33**				
PRP	-0.01	0.01	-.17				
OR	-0.02	0.02	-.13				
Cope	-0.06	0.06	-.09				
Religiosity/Spirituality Dimensions Regressed onto EBPQ							
Model				.05	.03	1.91	4, 135
Constant	45.30	0.75					
DSE	0.36	0.19	.20				
PRP	0.15	0.15	.13				
OR	-0.54	0.37	-.17				
Cope	-0.52	1.10	-.05				

Note. DSE = Daily spiritual experiences; PRP = Private religious practices; OR = Organizational religiousness; Cope = Religious coping. * $p < .05$; ** $p < .01$.

Table 4-5. Relations of God locus of health control and healthy eating.

	B	*SE B*	β	R^2	Adj. R^2	*F*	*df*	R^2 change
			GLHC Regressed onto HPLP					
Step 1				.03	.01	1.45	3, 139	
Constant	2.01	0.27						
Education	0.08	0.04	.16					
Age	0.00	0.00	.03					
Income	0.00	0.02	.02					
Step 2				.06	.03	2.19	4, 139	.03*
Constant	2.18	0.28						
Education	0.07	0.04	.15					
Age	0.00	0.00	.04					
Income	0.01	0.02	.04					
GLHC	-0.01	0.01	-.17*					
			GLHC Regressed onto EBPQ					
Step 1				.08	.06	3.69*	3, 139	
Constant	32.54	4.63						
Education	0.83	0.77	.10					
Age	0.21	0.07	.27**					
Income	-0.19	0.27	-.06					
Step 2				.13	.10	5.01**	4, 139	.05**
Constant	36.68	4.73						
Education	0.65	0.76	.08					
Age	0.22	0.06	.29**					
Income	-0.14	0.27	-.05					
GLHC	-0.24	0.08	-.23**					

Note. GLHC = God locus of health control. * $p < .05$; ** $p < .01$.

Table 4-6. Loadings for the measurement model.

Parameter estimate	Unstandardized loading	*SE*	*Z*	Standardized loading
HE → HPLP	.03	.01	4.14	.56**
HE → EBPQ	1.00			.94

Note. HE = healthy eating (latent construct). ** $p < .01$.

Table 4-7. Loadings onto healthy eating in the hypothesized structural model.

Indicator	Unstandardized loading	*SE*	*Z*	Standardized loading
		1.0		
Religious coping	.38		0.38	.04
Private religious practices	.09	.14	0.66	.08
Daily spiritual experiences	.50	.17	2.93	.30**
Organizational religiousness	-.57	.17	-1.75	-.19
GLHC	-.22	.08	-2.70	-.23**
GLHC x Religious Coping	.29	.12	2.31	.24*
GLHC x PRP	.03	.02	2.08	.27*
GLHC x DSE	-.02	.02	-.95	-.11
GLHC x OR	-.07	.04	-1.89	-.22
Age	.20	.06	3.43	.28***
Education	.78	.69	1.14	.10
Income	-.16	.24	-.68	-.06

Note. PRP = Private Religious Practices; DSE = Daily Spiritual Experiences; OR = Organizational Religiousness. * $p < .05$; ** $p < .01$; *** $p < .001$.

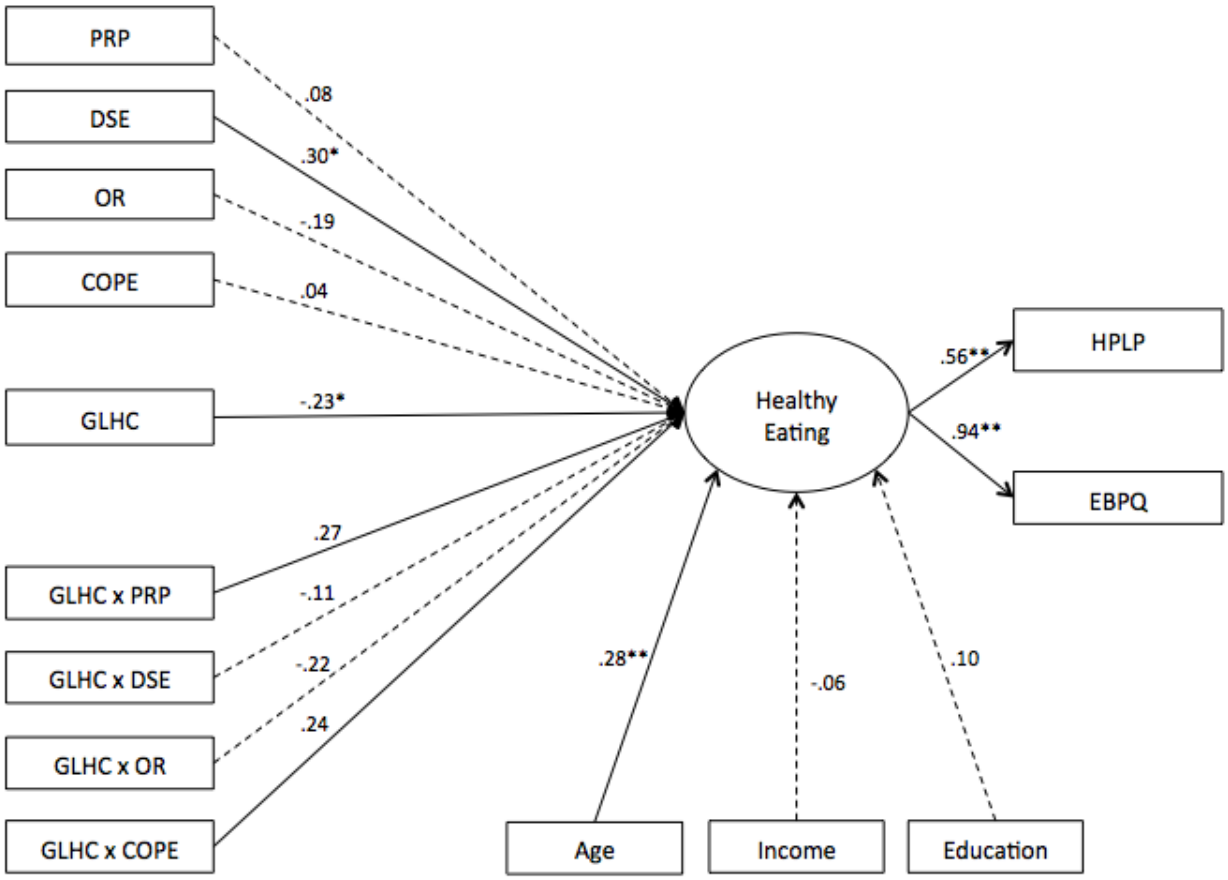

Figure 4-1. Structural model of relations between variables of interest and healthy eating. Standardized path coefficients are shown. Measurement errors are omitted for clarity. PRP = Private religious practices; DSE = Daily spiritual experiences; OR = Organizational religiousness; COPE = Religious coping; GLHC = God locus of health control; HPLP = Nutrition subscale of Health Promoting Lifestyles Profile-II; EBPQ = Low-Fat Eating subscale of Eating Behavior Patterns Questionnaire. Dashed lines indicate nonsignificant paths. Solid lines indicate $p \leq .05$. *$p \leq .01$, **$p < .001$.

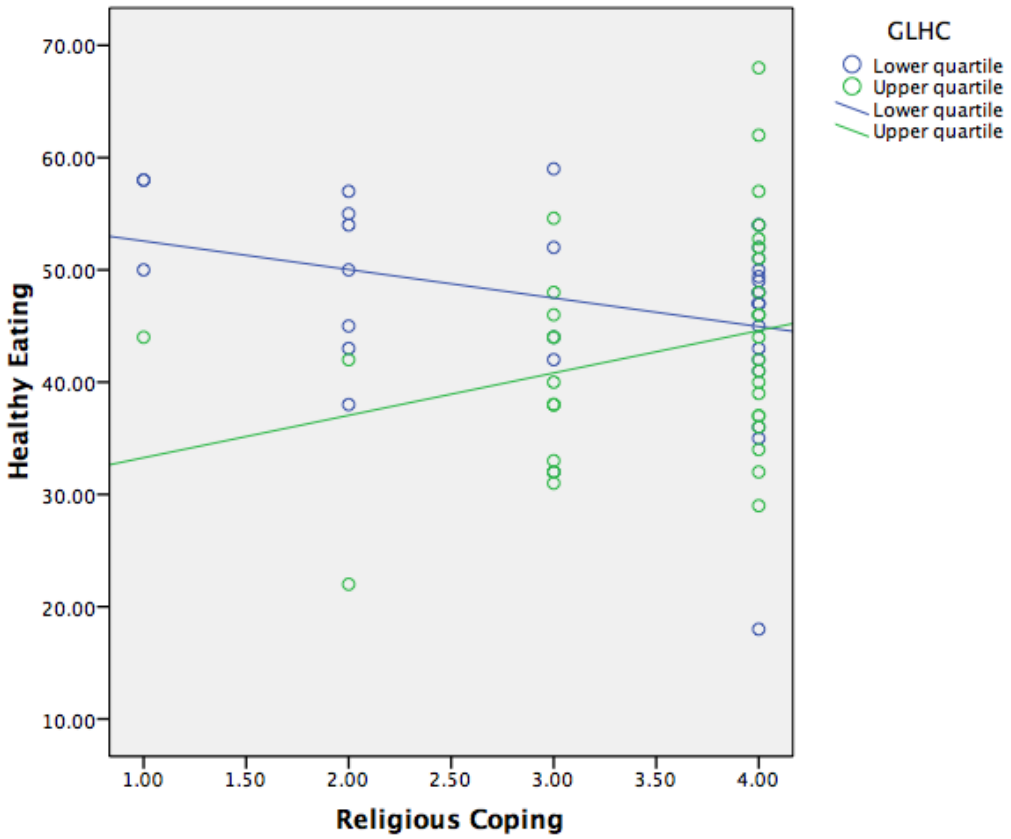

Figure 4-2. Linear relationships between religious coping and healthy eating at the upper and lower quartiles of endorsement of God locus of health control (GLHC).

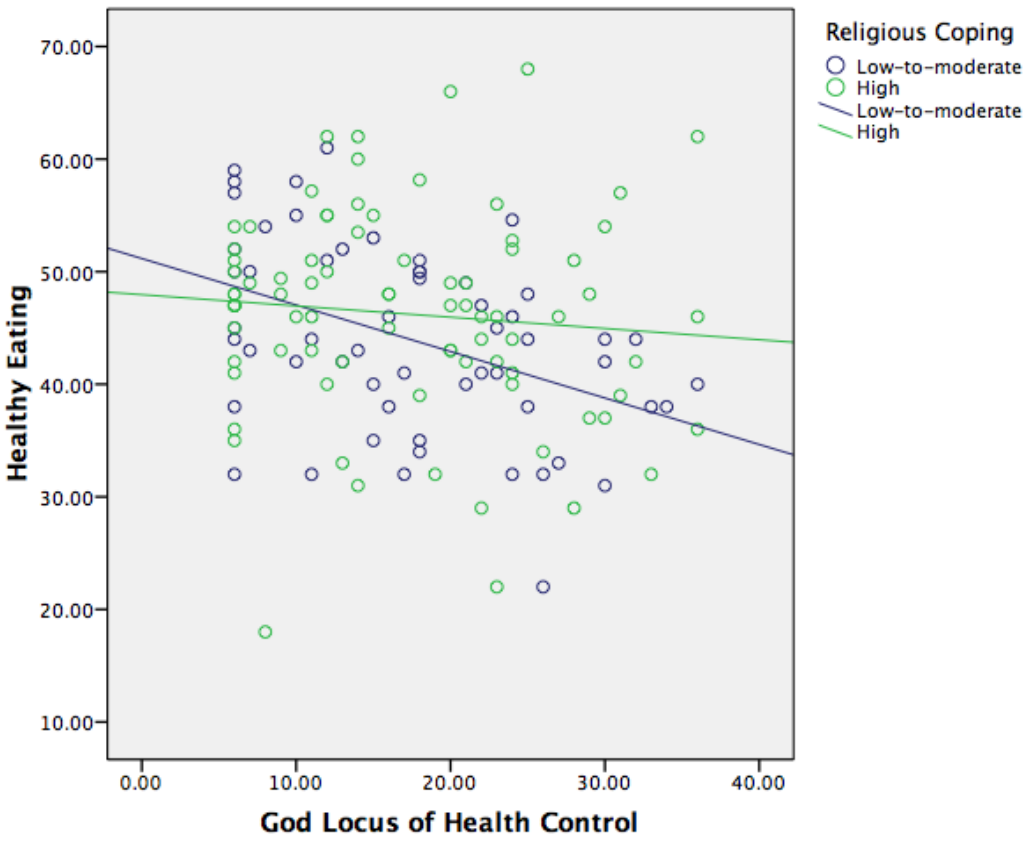

Figure 4-3. Linear relationships between God locus of health control and healthy eating behaviors at two levels of engagement in religious coping.

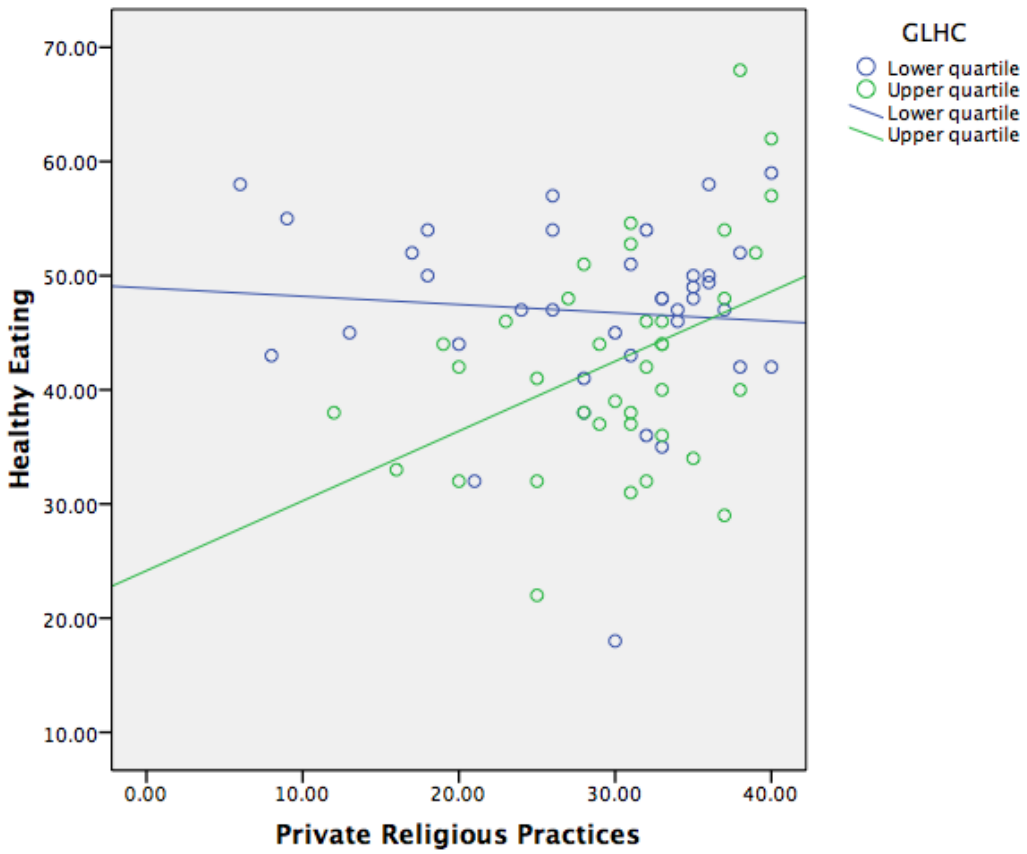

Figure 4-4. Linear relationships between private religious practices and healthy eating at the upper and lower quartiles of endorsement of God locus of health control (GLHC).

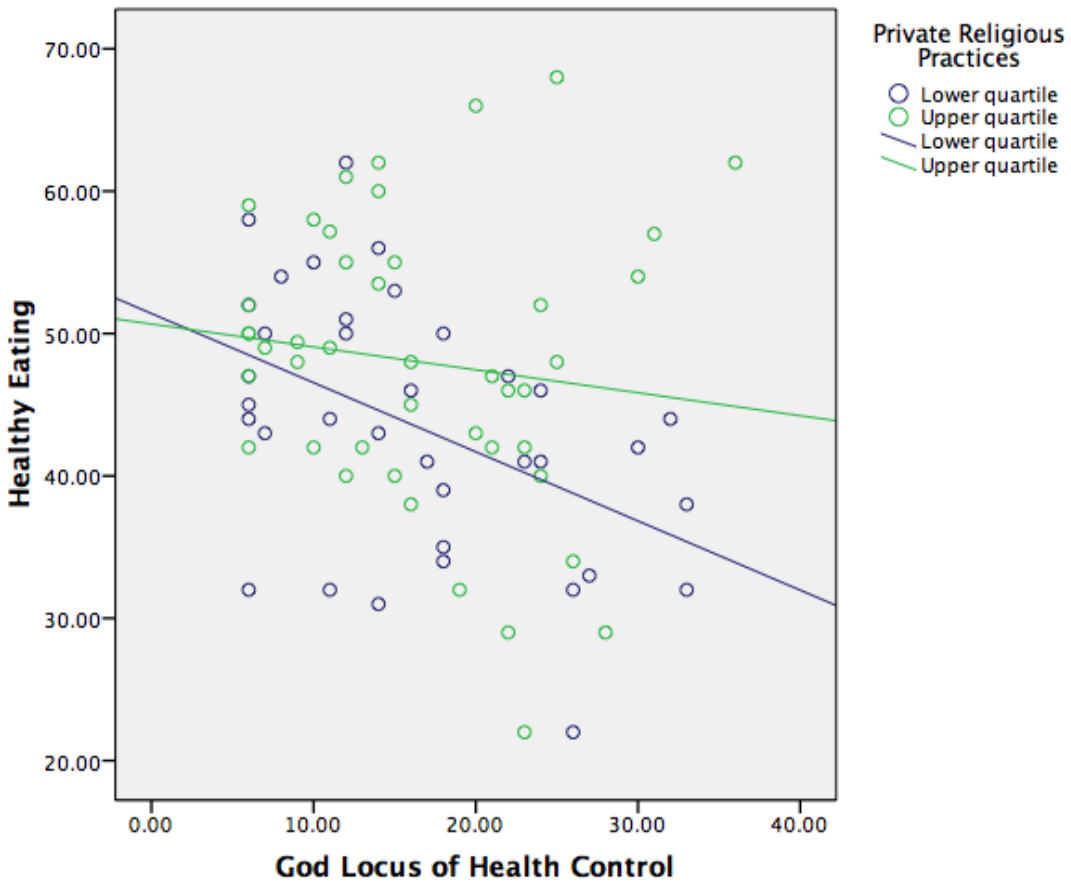

Figure 4-5. Linear relationships between God locus of health control and healthy eating behaviors at two levels of engagement in private religious practices.

CHAPTER 5
DISCUSSION

The present study collected cross-sectional data on religious/spiritual beliefs, healthy eating behaviors, and demographic characteristics from a community-based sample of adult males who identify as Black. The general purpose of the present study was to examine the relationships among dimensions of religiosity/spirituality, God locus of health control (GLHC; the belief that God controls one's health), and healthy eating within a community-based sample of Black men. A specific purpose was to examine GLHC as a potential moderator of the relationships between religiosity/spirituality dimensions and engagement in healthy eating.

In this study, religiosity/spirituality was conceptualized multidimensionally, as has been recommended (e.g., Idler et al., 2003, Seybold & Hill, 2001). The common unidimensional measurement of religiosity (Koenig et al., 2001), such as frequency of attendance at religious services, often provides an over-emphasis on organizational religiousness and an under-emphasis on more personal or non-institutional practices or perspectives. The creators of the Multidimensional Measure of Religiousness/Spirituality (Fetzer Institute, 1999) acknowledged that while some consider religiousness and spirituality to be indistinguishable, they conceptualize religiousness as having "specific behavioral, social, doctrinal, and denominational characteristics because it involves a system of worship and doctrine that is shared with a group," while spirituality "is concerned with the transcendent, addressing ultimate questions about life's meaning, with the assumption that there is more to life than what we see or fully understand" (p. 2). These authors note that it is possible to be spiritual without being religious and that, although spirituality is often a central aspect of religious involvement, it is possible to be

religious without being particularly spiritual (e.g., to practice religious doctrine without feeling a relationship to the transcendent/God/a higher power; Fetzer Institute, 1999). Four dimensions of religiosity/spirituality were assessed in this study: (1) organizational religiousness (i.e., frequency of attendance at religious services or other activities at a place of worship), (2) private religious practices (i.e., non-institutional religious/spiritual practices, such as praying or reading religious literature), (3) religious coping (i.e., involving religion in understanding or dealing with stressful situations), and (4) daily spiritual experiences (i.e., the perception of involvement with God and spirituality in daily life experiences). This chapter presents a summary and interpretation of results from this study, limitations of the study, directions for future research and intervention, implications for counseling psychologists, and conclusions.

Summary and Interpretation of Results

The present study is novel both because of the topic of examination and the population of focus (i.e., Black men represent a demographic that both experiences significant health disparities and tends to be underrepresented in health research). This study attempts to expand the research literature for two areas in which there is a paucity of information: (a) the relationship between religiosity/spirituality and healthy eating behaviors and (b) the construct of God locus of health control (i.e., the degree to which one believes that God controls one's health). A great deal of research has focused on the relationship between religiosity and health (broadly defined); however, little research has examined potential associations between religiosity and healthy eating in particular. Research examining God locus of health control, including potential associations between this construct and health behaviors, is also limited. The results from the

specific hypotheses and research questions examined in this study and the interpretations of these results are presented in the following sections.

Research Question 1: Demographic Associations with Healthy Eating Behaviors

Research Question 1 examined if engagement in healthy eating behaviors varied in association with age, education, and income in this sample of Black men. It was found that age was positively associated with healthy eating when healthy eating was defined by one of the two measures of healthy eating used in this study. Conversely, neither income nor education was found to be significantly associated with engagement in healthy eating. The finding that healthy eating increased with age within this sample of Black men is similar to the trend found in the nationally representative Third National Health and Nutrition Examination Survey (NHANES-III) that diet quality increased with age. However, unlike the findings of this study, NHANES-III found that income and education were also positively associated with diet quality (Guo, Warden, Paeratakul, & Bray, 2004). A number of explanations for these differences is possible. Potential explanations include different methods of measuring income and education, differing demographic characteristics of the samples, and the possibility of lower variation in eating behaviors within a single gender and racial group.

Research Question 2: Demographic Associations with God Locus of Health Control

Given the limited research that has been conducted on the construct of God locus of health control (GLHC), it seemed relevant to examine if and how the demographic variables of study (i.e., age, education, income) were related to this construct. Thus, Research Question 2 asked if degree of belief in GLHC varies in association with age, education, and/or income? Findings from the present study did not

indicate significant relationships between any of these demographic variables and GLHC.

Findings from prior studies that examined associations between GLHC and these demographic variables (i.e., age, income, and education) are mixed. Polzer and Miles' (2005) qualitative study involving African Americans with diabetes found that those who were most likely to turn their health over to God were individuals who were low-income, less educated, and elderly. On the other hand, in a breast cancer screening study of African American women in rural Louisiana, GLHC was negatively correlated with age and not correlated with income nor education level (Kinney et al., 2002). In a study of African American Christians—the majority of whom were low-income—health God control (i.e., a similar construct but not Wallston's GLHC scale) was not found to be associated with age (and associations with education and income were not examined; Gonnerman et al., 2008). Conversely, a study by the authors of the GLHC scale that included three samples of individuals with a chronic health condition—the majority of whom were female and European American—found that (a) age was negatively correlated with GLHC in one sample but not in the other two samples, (b) level of education was negatively associated with GLHC in two of the three samples, and (c) income was not significantly related to GLHC. The researchers also found no gender differences in GLHC (Wallston et al., 1999). Thus, findings from prior studies examining associations between GLHC and these demographic variables are diverse and inconsistent.

Research Question 3: The Relationship Between Religiosity/Spirituality and Healthy Eating Behaviors

Although a great deal of research has found significant associations between religiosity/spirituality and health, including many studies that report a positive relationship between these variables, little of this research has focused on health *behaviors* (i.e., as opposed to health status, health outcomes, or mortality). Among the few studies found that have examined potential associations between religiosity and healthy eating, results have been mixed, including whether or not an association exists at all (e.g., Homan & Boyatzis, 2010; Obiesesan et al., 2006; Underwood & Powell, 2006).

Research Question 3 asked if the four dimensions of religiosity/spirituality examined in this study (i.e., organizational religiousness, private religious practices, religious coping, and daily spiritual experiences) are significantly associated with healthy eating. Results found that only one of the four religiosity/spirituality dimensions explained unique variance in healthy eating; daily spiritual experiences (i.e., the perception of spirituality or interaction with/involvement of God in daily life experiences) was positively and uniquely related to healthy eating. On the other hand, no associations with healthy eating were found for private religious practices, organizational religiousness, nor religious coping. Overall, findings suggest that spirituality—not religiosity—is positively related to engagement in healthy eating among this sample of Black men.

Hypothesis 1: The Relationship Between GLHC and Healthy Eating

God locus of health control—the degree to which one believes that God controls one's health—has been conceptualized as a distinct dimension of locus of control

(Wallston et al., 1999; Welton et al., 1996). Although the amount of research on this construct has been limited, some studies have suggested that having a high God locus of health control (GLHC) is negatively associated with engagement in health behaviors (Kinney et al., 2002; Leaks, 2009; O'hea et al., 2005) or is not associated with health behaviors (Reindl Benjamins et al., 2011; Gonnerman at al., 2008). It is notable that the couple of studies found that suggest a positive relationship between GLHC and healthy behaviors/lifestyle used an operationalization of healthy behaviors/lifestyle that included mental health behaviors (e.g., stress management) in addition to physical health behaviors (Gonnerman at al., 2008; Welton et al., 1996).

The only study this author is aware of that has examined GLHC specifically in relation to healthy eating found no association between GLHC and healthy eating (Gonnerman at al., 2008). Given prior research suggesting a negative association of GLHC with other health promoting behaviors, hypothesis 1 in the present study stated that God locus of health control would have a significant negative association with healthy eating, above and beyond the effects of age, education, and income. Hypothesis 1 was tested separately with two measures of healthy eating (i.e., HPLP and EBPQ).

Findings from the present study largely supported hypothesis 1. When healthy eating was operationalized with the HPLP measure, GLHC accounted for unique negative variance in healthy eating, and the model predicted 6% of the variance in healthy eating. Results were more significant when healthy eating was operationalized with EBPQ, in that the model predicted 13% of the variance in healthy eating, and GLHC specifically explained an additional 5% of variance above and beyond that which

was explained by the demographic variables. Thus, findings suggest that as belief that God controls one's health increases, engagement in healthy eating tends to decrease. This finding is similar to findings from some other studies with samples that consist fully or predominantly of Black, African, or African American individuals, which found an inverse relationship between GLHC (or a closely-related construct) and health behaviors, such as diabetes management (O'hea et al., 2005), prostate cancer screening (Leaks, 2009), and breast cancer screening (Holt et al., 2003; Kinney at al., 2002).

Hypothesis 2: GLHC as a Moderator of Religiosity/Spirituality and Healthy Eating

Hypothesis 2 proposed that when controlling for age, education, and income, GLHC would moderate the relationship between dimensions of religiosity/spirituality and healthy eating. Structural Equation Modeling was used to test this hypothesis, as this analysis allowed for the creation of a latent *healthy eating* variable that was determined from responses on the two healthy eating measures. The tested model accounted for 28% of the variance in healthy eating. Hypothesis 2 was partially supported, in that GLHC was found to moderate the relationship between religiosity/spirituality and healthy eating for two of the four dimensions of religiosity/spirituality: religious coping and private religious practices. For individuals with the highest endorsement of GLHC, healthy eating increased as engagement in religious coping and private religious practices increased. Conversely, for individuals with the lowest endorsement of GLHC, healthy eating decreased as religious coping increased, but no relationship was found between healthy eating and private religious practices.

Another way these interaction effects can be understood is as follows: Healthy eating decreased as belief in GLHC increased among (a) individuals with the lowest

engagement in private religious practices and (b) individuals who endorsed a low to moderate degree of religious coping (i.e., religion is *not involved* to *somewhat involved* in understanding or dealing with stressful situations). Conversely, no significant relationship was observed between healthy eating and GLHC among (a) individuals who endorsed a high degree of religious coping (i.e., religion is *very involved* in understanding or dealing with stressful situations; 59% of the sample) and (b) individuals with the highest engagement in private religious practices.

Overall, within this sample of Black men from north/north-central Florida, it appears that GLHC had little to no association with healthy eating behaviors among the men who endorsed the highest engagement in private religious practices and religious coping; however, among the men with comparatively lower levels of private religious practices and religious coping, healthy eating decreased as GLHC increased. The individuals least likely to engage in healthy eating appeared to be those who reported low engagement in religious practices/coping yet endorsed a high level of belief that God controls their health.

Limitations of the Present Study

Findings from this study must be interpreted in light of some limitations. First, it is important to note that the findings of this study are certainly not generalizable to all Black men in the U.S., as this sample is relatively small, was geographically limited to north/north-central Florida, and was highly educated. Sixty percent (60%) reported that they had completed college, and half of that 60% reported that they had completed graduate school as well. Also, these findings are—of course—not generalizable to Black or African American women, nor to men of other racial/ethnic groups.

Additionally, religious affiliation was not taken into account in this study, so it is not possible to know the exact make-up of the sample with regard to religious affiliation, or if the findings may differ in accordance with religious affiliation. Although affiliation was included in the demographic questionnaire, and nearly all participants endorsed some form of Christianity, the variability of responses from this write-in item made this data difficult to quantify.

Limitations of the present study include the cross-sectional nature of this data and shortcomings in relation to assessment. While data from a single time-point can provide a useful “snap shot” of information, it is impossible to know if these findings would be stable over time or if participants’ self-reports of their religiosity or eating habits might change based on time-related factors, such as time of year or proximity to religious holidays. Also, of course no causal directions can be inferred from this cross-sectional data. However, research testing casual relations between health and locus of control beliefs is needed, given that one’s health locus of control beliefs could depend one’s current health status (Luszczynska & Schwarzer, 2005).

Similarly, the present study does not take into account health status nor have a manner of assessing the duration of time an individual has engaged in his current level of healthy eating habits. Thus, it is impossible to consider information such as how health status might be related to God locus of health control, or for what period of time an individual has been engaging in his current eating behaviors. Such information on duration of current habits is difficult to obtain, but could help to answer questions such as: Is healthy eating his norm? Has he recently started following specific recommendations in order to combat a diagnosed health condition?

Given the intent to collect information on eating habits without requiring time-intensive methods that might deter individuals' willingness to participate, two brief questionnaires with demonstrated reliability and validity were utilized in the present study. However, the potential limitations to self-report data in the assessment of daily behaviors (e.g., recall reliability, social desirability bias) are important to note, particularly with regard to eating habits.

This study's multidimensional assessment of religiosity and spirituality can be perceived as a significant improvement over the historically common practices of operationalizing religiosity as religious affiliation only (Koenig et al., 2001) or using brief or single-item global measures, such as frequency of church attendance or self-rated religiousness and spirituality (Hill & Pargament, 2003). Even so, the subscales used in the present study may be limited by their brevity, and one of the four subscales (i.e., religious coping) was comprised of only a single item.

Additional information relevant to informing health behavior intervention programs might have been collected through inclusion of a measure of internal locus of health control. Although the authors of the God Locus of Health Control scale approve the use of this measure either alone or in conjunction with their other locus of health control measures (Wallston et al., 1999), it is possible that inclusion of a measure of internal locus of health control in the tested model may have further elucidated the relationships among the variables of study, possibly by delineating the effects of God locus of health control (GLHC) from other forms of locus of health control. However, findings from past research suggest that the relationship between internal locus of health control (or internal locus of control) and GLHC (or God locus of control) is currently unclear and

may vary with demographic characteristics. For example, GLHC beliefs were positively associated with internal locus of health control in a sample of low-income African Americans (Gonnerman et al., 2008; Holt et al., 2003); similarly, God locus of control and internal locus of control were positively related in a sample of Black congregants who had an average of three years of college education (Jackson & Coursey, 1988). On the other hand, negative correlations were found between God health control and internal health control in a study of university students (race/ethnicity not provided; Welton et al., 1996). It is important to note that varying measures of GLHC were used in these studies. In sum, future research in this area may benefit from larger and more diverse samples (e.g., geographically diverse, educationally diverse), multiple measures to assess each construct and more research to inform the selection of such measures, and the inclusion of other forms of health locus of control.

Future Directions for Research and Interventions

The current study lays some groundwork for future research examining potential associations between religiosity/spirituality variables and health behaviors, particularly among Black and/or African American adults. Although this study specifically examines healthy eating, similar research could be conducted focusing on other health behaviors such as physical activity. It appears that the vast majority of research conducted thus far on the relationship between religiosity and health has examined health status variables (e.g., presence of disease, self-rated health) or mortality rates, and that very little of such research has focused on health behaviors. Additionally, past religiosity-health research seems to have focused more often on patient populations rather than community-based samples, the latter of which may be more relevant to the development of prevention and early intervention programs.

Given the high prevalence of chronic disease and the significant health disparities that disproportionately impact African American and Black individuals (NCHS, 2010; Roger et al., 2011; USDHHS, OMH, 2009), it is important that future health research includes a particular focus on this racial/ethnic minority group. Furthermore, given the trend of religious organizations housing health programs (Campbell et al., 2007; Trinitapoli et al., 2009), particularly within African American/Black communities, it is crucial that health researchers and individuals responsible for developing health promotion/intervention programs, develop an understanding of how religious and spiritual variables may (or may not) be associated with health promoting behaviors.

Findings of the present study provide an example of the complexity of examining religiousness and spirituality, particularly in relation to health behaviors. In this study, some religiosity/spirituality variables were positively associated with healthy eating, while other religiosity/spirituality variables were negatively associated with healthy eating, and yet other religiosity/spirituality variables demonstrated no associations with healthy eating at all. Further research examining which religious and/or spiritual factors may be motivators of or barriers to health behavior change could assist in determining the potential for the inclusion of religious components in faith-based intervention programs.

If religious settings are to continue to be utilized as sites for health promotion and intervention programs, it is important that researchers explore ways in which religiosity or spirituality might impact the outcomes of such programs or be incorporated into such programs to increase their efficacy. Future research could elucidate how health promotion messages and religiosity messages could be combined to effectively promote

health, and if incorporating such messages would provide an added benefit to such programs. The “my body is my temple” teaching, for example, seems to have been commonly applied to efforts to promote abstinence from alcohol and drugs, yet such a message clearly holds potential for increasing health promoting behaviors such as healthy eating as well.

In order for such an approach to be conducted in a culturally sensitive manner, of course it will be crucial to include religious leaders in the planning and implementation of such programs. [For a discussion of incorporating cultural and spiritual sensitivity into community-based health promotion research, see writings such as Campbell et al., 2007]. Particularly in relation to African American/Black communities, it is also important to consider that the influence of pastors in these communities is significant. The influence of such pastors often extends beyond serving as spiritual leaders to serving as potential agents of health behavior changes (Levin, 1986).

There may be some religious or spiritual beliefs that impact health behaviors (positively or negatively)—beliefs that could be influenced by religious leaders. For example, in this study, the belief that God controls one’s health was inversely related to engagement in healthy eating (except in the case of the most highly religious individuals). If further research supports this finding, then addressing this issue in a culturally and spiritually sensitive manner through collaborations with religious leaders in African American/Black communities could potentially lead to increased involvement of members of these communities in healthy eating.

Based on the present study’s findings that various dimensions of religiosity and spirituality had differing associations with health behavior, future research in this area

should include a multidimensional assessment of religiosity/spirituality, as has been previously recommended by other researchers (Idler et al., 2003; Seybold & Hill, 2001), and should separately examine each dimension's unique associations with health variables. Also, for the purposes of health-related research, it is important that spirituality is specifically assessed in addition to religiosity (Weaver et al., 2006). Finally, future research should further examine the construct of God locus of health control (GLHC) and determine how this construct may relate to engagement in health behaviors.

Polzer and Miles (2005) wrote about the distinction between *turning to God* versus *turning it over to God*; future research may benefit from a measure intended for use in health research that specifically provides a way of distinguishing between these two related but meaningfully distinct constructs. Given that studies examining GLHC and related constructs (e.g., religious health fatalism) are currently limited in number, research comparing measures that assess GLHC and similar constructs is especially needed to elucidate which measure(s) are most relevant for health-related research. It is additionally pertinent that future research assesses which multidimensional religiosity/spirituality measures are most relevant for health research, while taking into account the benefits of brief measurement in community-based research.

Finally, it is interesting to note that the limited associations found in this study between the four examined religiosity/spirituality dimensions and healthy eating are in contrast to the plethora of research that suggests a protective effect of religiosity on mortality and/or chronic disease (George et al., 2000; Gillum & Ingram, 2006; Powell et al., 2003; Williams & Sternthal, 2007). Thus, future research on the *religion-health*

connection (Ellison & Levin, 1998) should compare the relationships between religiosity and health status/mortality variables with the relationships between religiosity and health behaviors. Such research could determine if and how religiosity may be differentially associated with varying operationalizations of health and could examine the underlying mechanisms that explain the nature of such relationships.

Implications for Counseling Psychologists

The health focus of the present study is highly relevant for the field of counseling psychology, as this field is making increasing contributions to health psychology. As stated in a recent publication by Raque-Bogdan, Torrey, Lewis, and Borges (2012):

> Counseling psychologists are poised to make unique contributions to clinical health psychology given counseling psychology's long-standing focus on wellness and prevention; a holistic, developmental, and strengths-based approach to individual health (Chwalisz & Obasi, 2008); and multiculturalism (Eppserson, Fouad, Stoltenberg, & Murdock, 2005). (p. 2)

Indeed, this position is reinforced by (a) the existence of specialized sections such as the Counseling Health Psychology section and the Prevention section in the American Psychological Association's Society of Counseling Psychology, and (b) publications such as the 2007 Major Contribution in *The Counseling Psychologist* that focused on the roles of counseling psychologists in addressing health disparities through culturally sensitive health care research and interventions (e.g., Tucker et al., 2007).

This study is a prime example of counseling health psychology research, in that it examines associations between psychosociocultural factors (i.e., religiosity/spirituality variables) and a behavioral factor (i.e., healthy eating) that relates to multiple chronic health conditions. Given that eating behaviors are associated with many of the most common chronic health conditions impacting our country, it is pertinent that counseling

psychologists (a) elucidate the psychosociocultural factors that are associated with engagement (or lack of engagement) in healthy eating behaviors and (b) contribute to the development of research-based health promotion programs that take into account psychosociocultural factors.

Given that approximately 89% of Americans identify with religiosity (Pew Forum on Religion & Public Life, 2008), it is sensible that health professionals develop a specific understanding of if and how religious and spiritual beliefs relate to health behaviors. Furthermore, given that African Americans/Black Americans are the most likely of all major racial and ethnic groups in the U.S. to report a formal religious affiliation (Pew Forum on Religion & Public Life, 2008), it may be particularly important to consider religious factors when working with African Americans/Black Americans.

If further research supports the existence of associations between religious/spiritual beliefs and health behaviors such as healthy eating, counseling psychologists could be particularly useful in determining how to increase the efficacy of health education, prevention, and intervention programs by incorporating religiosity/spirituality in a culturally and spiritually-sensitive manner. Counseling psychologists also often work with clients/patients on an individual level to change health-related behaviors, such as those who have been advised to alter their eating after diagnosis of a chronic health condition. The present research suggests that in such scenarios, it may be useful to ask clients/patients about their religious/spiritual beliefs—including the degree to which one believes that God controls one's health—and to assess how these beliefs relate, for example, to their motivation to engage in healthy eating behaviors.

Conclusions

Within the sample of African American/Black men from north/north-central Florida in the present study, only one of the four examined dimensions of religiosity/spirituality demonstrated a significant association with healthy eating. Specifically, endorsement of daily spiritual experiences was positively related to engagement in healthy eating, but none of the other three dimensions (i.e., organizational religiousness, private religious practices, and religious coping) demonstrated a significant relationship with healthy eating. On the other hand, God locus of health control (GLHC) was found to be negatively associated with healthy eating.

Furthermore, the relationships among these variables demonstrated greater complexity when the interactions between GLHC and religiosity/spirituality dimensions were examined in association with healthy eating. Specifically, for individuals with low endorsement of private religious practices/religious coping, engagement in healthy eating differed in accordance with level of endorsement of GLHC (i.e., those with low GLHC exhibited greater engagement in healthy eating than those individuals with high GLHC). On the other hand, among individuals with high endorsement of religious practices/coping, no differences were observed in engagement in healthy eating in accordance with GLHC.

Thus, GLHC may be a relevant variable to consider in the context of healthy eating interventions and health research among Black men. One interpretation of these findings is that although a strong belief that God controls one's health may generally be negatively associated with engagement in healthy eating behaviors, high religiosity may be protective against this association. Given the need for effective interventions to promote healthy eating, and given the trend of using religious institutions as a setting for

such interventions, it is important that future research and public health initiatives take into consideration both the potential relationships between religiosity/spirituality variables and engagement in health behaviors.

APPENDIX A
DEMOGRAPHIC DATA QUESTIONNAIRE

Directions: Please fill in the blanks and answer the questions on this questionnaire. Please answer the questions honestly and to the best of your knowledge. The information you provide will be kept confidential. Do not write your name on this questionnaire. For questions that have bubbles (O), completely fill in the bubble beside the information that best answers the question. Filled-in bubbles should look like this: ●

What is your employment status?

- O Work full-time
- O Work part-time
- O Currently unemployed but looking for a job
- O Do not work (stay-at-home parent, retired, on disability, etc.).

What is the highest level of education that you have completed?

- O Elementary school
- O Junior high/middle school
- O High school or GED
- O Some college/Technical school
- O College
- O Graduate school

What is your current relationship status?

- O Single, living with a partner
- O Single, living without a partner
- O Married, living with your spouse
- O Married, not living with your spouse
- O Divorced or separated
- O Widow/Widower

What is your gender?

- O Female
- O Male

What is your age? _____

How tall are you? _____ feet and _____ inches

What was your weight the last time you were weighed? _____ pounds

In what country were you born?

_____

In what country were your parents born?

_____

In what country have you spent most of your life?

_____

What is the <u>combined</u> annual income of all of the people living in your household?

- O Less than $10,000
- O $10,000 to $19,999
- O $20,000 to $29,999
- O $30,000 to $39,999
- O $40,000 to $49,999
- O $50,000 to $59,999
- O $60,000 to $69,999
- O $70,000 to $79,999
- O $80,000 to $89,999
- O $90,000 to $99,999
- O More than $100,000

How many people currently live in your household (including yourself)?

- O 1
- O 2
- O 3
- O 4
- O 5
- O 6
- O 7
- O 8
- O 9 or more

Have you been told by a doctor or other health professional that you have any of the following health problems? (Please bubble in all of the health problems that you have been told you have.)

- O High cholesterol
- O Overweight/obesity
- O Diabetes
- O Asthma
- O Arthritis
- O Stress
- O High blood pressure (Hypertension)
- O Heart/Cardiovascular disease
- O Prostate Cancer
- O Other Cancer (type: _____)
- O Depression
- O Mental Illness
- O Other Health Problem(s) Not Listed (please list): _____

If you have been diagnosed with diabetes, what type of diabetes do you have?

- O I have not been diagnosed with diabetes.
- O Type 1 diabetes
- O Type 2 diabetes
- O Not sure what type of diabetes I have

From your perspective, how important is it for you to lose weight?

- O Not at all important
- O Only a little important
- O Moderately important
- O Very important

Are you currently trying to lose weight?

- O No.
- O Yes, I am trying a little.
- O Yes, I am actively trying, but it is not a major focus in my life right now.
- O Yes, I am actively trying. It is a major focus in my life right now.

Your ethnicity is:

- O African-American of American origin (born and grew up in America)
- O African-American of African origin (born in Africa but now an American citizen)
- O African-American of Caribbean origin (born in one of the Caribbean Islands but now an American citizen)
- O African
- O Caribbean
- O Other (please state) _____

Your current residence is classified as:

- O Rural (Country)
- O Urban (City)

To what extent do you consider yourself a <u>religious</u> person?

- O Very religious
- O Moderately religious
- O Slightly religious
- O Not religious at all

To what extent do you consider yourself a <u>spiritual</u> person?

- O Very spiritual
- O Moderately spiritual
- O Slightly spiritual
- O Not spiritual at all

Healthcare Services:

Where do you usually receive your health care services?

- O health care center/clinic
- O private practice
- O hospital
- O health department
- O other (please specify): _____

Whenever you have to pay for the cost of your healthcare (such as doctor's fee or medication), what portion do you usually pay?

- O All the bills
- O More than half of the bills
- O About half of the bills
- O Less than half of the bills
- O None of the bills

How often do you have physical health examinations?

- O Every year
- O Every other year
- O Occasionally
- O Rarely
- O Never

Do you have a regular doctor you see for your medical care?

- O Yes
- O No

Prostate Cancer Screening:

I was tested for prostate cancer with the Digital Rectal Examination (DRE) within the last two years (*not* including today).

- O Yes
- O No

I was tested for prostate cancer with the Digital Rectal Examination (DRE) within the last year (*not* including today).

- O Yes
- O No

I was tested for prostate cancer with the PSA test within the last two years (*not* including today).

- O Yes
- O No

I was tested for prostate cancer with the PSA test within the last year (*not* including today).

- O Yes
- O No

THANK YOU FOR YOUR PARTICIPATION!

APPENDIX B
GOD LOCUS OF HEALTH CONTROL SCALE

Directions: Each item below is a belief statement about your health with which you may agree or disagree. For each item, please circle the bubble that represents how much you agree or disagree with that statement. Please try to answer **EVERY ITEM** and fill-in **ONLY ONE** bubble per item. This is a measure of your personal beliefs; there are no right or wrong answers. Your answers should look like this: ●

	Strongly Disagree	**Moderately Disagree**	**Slightly Disagree**	**Slightly Agree**	**Moderately Agree**	**Strongly Agree**
1. If my health worsens, it is up to God to determine whether I will feel better again.	O	O	O	O	O	O
2. Most things that affect my health happen because of God.	O	O	O	O	O	O
3. God is directly responsible for my health getting better or worse.	O	O	O	O	O	O
4. Whatever happens to my health is God's will.	O	O	O	O	O	O
5. Whether or not my health improves is up to God.	O	O	O	O	O	O
6. God is in control of my health.	O	O	O	O	O	O

APPENDIX C
BRIEF MULTIDIMENSIONAL MEASURE OF RELIGIOUSNESS/SPIRITUALITY
(SELECTED SUBSCALES)

Directions: The following questions deal with possible spiritual experiences. To what extent do you experience the following? Please shade in the circle beneath the answer you choose like this: ●.

		Many times a day	**Every day**	**Most days**	**Some days**	**Once in a while**	**Never or almost never**
1.	I feel God's presence.	○	○	○	○	○	○
2.	I find strength and comfort in my religion.	○	○	○	○	○	○
3.	I feel deep inner peace or harmony.	○	○	○	○	○	○
4.	I desire to be closer to or in union with God.	○	○	○	○	○	○
5.	I feel God's love for me, directly or through others.	○	○	○	○	○	○
6.	I am spiritually touched by the beauty of creation.	○	○	○	○	○	○

	More than once a week	Every week or more often	Once or twice a month	Every month or so	Once or twice a year	Never
7. How often do you go to religious services?	○	○	○	○	○	○
8. Besides religious services, how often do you take part in other activities at a place of worship?	○	○	○	○	○	○

9. What is your current religious preference? _____

	More than once a day	Once a day	A few times a week	Once a week	A few times a month	Once a month	Less than once a month	Never
10. How often do you pray privately in places other than at church?	○	○	○	○	○	○	○	○
11. Within your religious or spiritual tradition, how often do you meditate?	○	○	○	○	○	○	○	○
12. How often do you watch or listen to religious programs on TV or radio?	○	○	○	○	○	○	○	○
13. How often do you read the Bible or other religious literature?	○	○	○	○	○	○	○	○
14. How often are prayers or grace said before or after meals in your home?	○	○	○	○	○	○	○	○

Directions: Think about how you try to understand and deal with major problems in your life. To what extent is each of the following involved in the way you cope. Please shade in the circle beneath the answer you choose like this: ●.

		A great deal	Quite a bit	Somewhat	Not at all
15.	I think about how my life is part of a larger spiritual force.	○	○	○	○
16.	I work together with God as partners.	○	○	○	○
17.	I look to God for strength, support, and guidance.	○	○	○	○

		Very involved	Somewhat involved	Not very involved	Not involved at all
18.	To what extent is your religion involved in understanding or dealing with stressful situations in any way?	○	○	○	○

APPENDIX D

HEALTH-PROMOTING LIFESTYLE PROFILE II: NUTRITION SUBSCALE (REVISED)

Directions: We want to know about your way of life and personal habits. Please answer each question as honestly as you can, and try not to skip any question. Show how often you do each behavior by filling in one circle for each question. Your answers should look like this: ●

	How often do you:	**Never**	**Sometimes**	**Often**	**Routinely (Very Often)**
1.	Choose a diet low in fat, saturated fat, and cholesterol?	○	○	○	○
2.	Limit use of sugar and food containing sugar?	○	○	○	○
3.	Eat 6-11 servings of bread, cereal, rice, and pasta each day?	○	○	○	○
4.	Eat 2-4 servings of fruit each day?	○	○	○	○
5.	Eat 3-5 servings of vegetables each day?	○	○	○	○
6.	Eat 2-3 servings of milk, yogurt, or cheese each day?	○	○	○	○
7.	Eat only 2-3 servings from the meat, poultry, fish, eggs, and nuts group each day?	○	○	○	○
8.	Read labels to identify nutrients, fats, and sodium content in packaged food?	○	○	○	○
9.	Eat breakfast?	○	○	○	○
10.	Add salt to your food?	○	○	○	○
11.	Eat whole grains (such as whole-wheat bread, whole-wheat pasta, or brown/wild rice) each day?	○	○	○	○
12.	Limit sugary drinks to no more than one per day (such as non-diet soda, energy drinks, sports drinks, fruit drinks)?	○	○	○	○

APPENDIX E

EATING BEHAVIOR PATTERNS QUESTIONNAIRE: LOW-FAT EATING SUBSCALE (REVISED)

Directions: We want to know about your eating habits. Please answer each question as honestly as you can, and try not to skip any questions. Show how much you agree with each behavior by filling in one circle for each question. Your answers should look like this: ●

	1 Strongly Disagree	**2 Disagree**	**3 Neutral**	**4 Agree**	**5 Strongly Agree**
1) I reduce fat in recipes by substituting ingredients and cutting portions.	○	○	○	○	○
2) I am very conscious of how much fat is in the food I eat.	○	○	○	○	○
3) I use low-fat food products.	○	○	○	○	○
4) I choose healthy foods to prevent heart disease.	○	○	○	○	○
5) I count fat grams.	○	○	○	○	○
6) I carefully watch the portion sizes of my foods.	○	○	○	○	○
7) When choosing fast food, I pick a place that offers healthy foods.	○	○	○	○	○
8) Fish and poultry are the only meats I eat.	○	○	○	○	○
9) I like to eat vegetables seasoned with fatty meat.	○	○	○	○	○
10) I eat meatless meals from time to time because I think that is healthier for me.	○	○	○	○	○
11) I try to limit my intake of red meat (beef and pork).	○	○	○	○	○
12) I buy snacks from vending machines.	○	○	○	○	○
13) I take a shopping list to the store.	○	○	○	○	○
14) Instead of planning meals, I choose what is available and what I feel like eating.	○	○	○	○	○

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BIOGRAPHICAL SKETCH

Lillian (Lily) Boynton Kaye was born and raised in Tallahassee, Florida, where she co-owns a business, Railroad Square, LLC. She graduated summa cum laude from the University of Florida with a Bachelor of Science in psychology and a Bachelor of Arts in linguistics, and received “highest honors” for her senior thesis on health belief variables and alcohol/drug use among college students. A year later, she entered the Counseling Psychology Ph.D. Program in the University of Florida’s Department of Psychology, under the mentorship of Dr. Carolyn Tucker. In 2008, Lily completed a master’s thesis on the motivators of and barriers to healthy eating behaviors among low-income children and received a Master of Science in psychology.

Throughout graduate school, Lily held leadership positions focused on the development and implementation of several of Dr. Tucker’s grant-funded community-based health promotion and intervention programs targeting low-income and racial/ethnic minority families and individuals. Lily co-led the production of *The Family Health Self-Empowerment DVD* and the associated participant resource guide. She also trained community leaders in Gainesville, FL, Lexington, KY, and the Bronx, NY to implement these interventions.

Clinically, Lily completed practicums in a number of settings throughout her doctoral training, including the North Florida/South Georgia Veterans Hospital, and the Behavioral Health Unit and Anxiety Disorders/OCD Clinic at Shands Hospital. She completed her predoctoral internship at the University of Florida’s Counseling and Wellness Center. In 2011, she received the Ted Landsman Award in Counseling Psychology from her home department. In summer 2012, Lily defended her dissertation and graduated with a Ph.D. in counseling psychology.