PSYCHOLOGICAL, BEHAVIORAL, AND CULTURAL FACTORS THAT INFLUENCE THE RELATIONSHIP BETWEEN PERCEIVED DISCRIMINATION AND CHRONIC HEALTH ILLNESSES AMONG AFRICAN AMERICAN WOMEN

by

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(Under the Direction of Rheeda Walker)

ABSTRACT

Research studies have begun to examine the pathways of perceived discrimination that lead to poor chronic health outcomes for African Americans (Anderson, McNeilly, & Myers, 1991. However, there is a paucity of studies examining the role of psychological symptoms in the relationship between perceived discrimination and chronic health outcomes. The present study examines the mediational role of non-specific symptoms of anxiety on the relationship between perceived discrimination and chronic health problems for African American women. The role of religiosity and health promoting behaviors was also taken into consideration via moderated mediational analyses. Results revealed that perceived discrimination was correlated with chronic health problems as expected. Moderated mediational analyses indicated that non-specific anxiety significantly mediated the relationship between perceived discrimination and chronic health problems. Further, religiosity was not a significant moderator of the proposed model. Health-promoting behaviors did significantly moderate perceived discrimination on nonspecific anxiety in the full-proposed model, but did not significantly moderate non-specific anxiety on chronic health problems. The implications of the current findings are discussed.

INDEX WORDS: Perceived discrimination, Anxiety, Chronic health, African Americans, Religiosity, Health behaviors

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INTRODUCTION

The two leading causes of death in the United States, heart disease and cancer, have been found to have the highest mortality rates in African American populations (National Center for Health Statistics, 2008). Chronic and preventable diseases of diabetes, hypertension, cardiovascular disease, and obesity also disproportionately affect African Americans (Davis, Liu, & Gibbons. 2003; Krieger, 1990; Krieger et al., 1993). Williams and colleagues (2010) report that the key characteristics of the elevated rates of disease for African Americans are the greater severity of disease, the earlier onset of illness, and poorer survival.

Harper (1990) reported that more than half of the African American elderly are in poor health and are also more inclined to experience higher rates of multiple chronic illnesses in the United States. With regard to examining the early onset and severity of illnesses for African Americans, breast cancer for African American women particularly show disparate results. Anderson et al. (2008) found that although African American women have a lower overall incidence rate of breast cancer in comparison to European American women, African American women under the age of 40 have a higher risk of early onset and severe types of breast cancer that are resistant to treatment. Recent research has also shown that African American women particularly report experiencing poorer physical health across health indices of self-rated health, chronic illness, and functional limitations (Erving, 2011). Due to current research findings showing that African Americans are more likely to have severe illnesses, get sick sooner, and die at an earlier rate than European Americans, there is a dire necessity to examine the etiology and maintenance of racial disparities in health outcomes.

Researchers have speculated about what causes or exacerbates poor health conditions among African Americans. Some authors posit that African Americans are biologically and genetically more susceptible to certain diseases than their European American counterparts (Clark et al., 1999; Feldman & Fulwood, 1999). Other researchers have taken a broader oppressive systemic outlook into this puzzling gap in health outcomes, and examined factors such as inadequate access to health care services, racial residential segregation, and limitations in job and educational opportunities (Harrell, 1999; Pickering, 1999; Williams & Collins 2000). These identified enduring stressors have progressively become viewed as consequential factors of racism and race-based discrimination, whereby the persistent experiences and exposure to race-related chronic stressors leads to poor health outcomes (Clark et al., 1999; Mays et al., 2007).

Several researchers have developed culturally specific models to further understand the pathways of perceived discrimination that lead to poor health outcomes for African Americans (Anderson, McNeilly, & Myers, 1991; Clark et al., 1999; Harrell, Merritt, & Kalu, 1998). These conceptual models and research findings all seem to address the psychological and physiological stress impact of perceived discrimination, but a missing link may be in examining specific factors, such as symptoms of anxiety, as a mechanism between perceived discrimination and chronic health problems. Some studies have examined the role of anxiety symptoms in relation to perceived discrimination for African American populaces (Soto, Dawson-Andoh, & BeLue, 2011; Utsey, & Payne, 2000). However, none have examined these associations for African American women separately or examined anxiety symptoms' potential mediating effect on the relationship between perceived discrimination and health outcomes.

In consideration of a risk and resilience framework for susceptibility to chronic health problems, examining the intricate relationship between health, culture, and individual health behaviors (Harrell, 1999; Semmes, 1995) could be insightful. Research has found that for African American women, stress levels have an influence on decision making to adopt health-promoting behaviors (Edmonds, 2010). Also a growing body of research has reported the salient effect of religiosity (Bowen-Reid & Harrell, 2002; Young, Cashwell, & Sheherbarkova, 2000; Bowen-Reid & Smalls, 2004) and this cultural factor's protective effect on psychological and physical health (Levin, Chatters, & Taylor,1995; Wallace & Foreman, 1998). Given the known disparate outcomes of chronic disease and disability, particularly for African American women, the overarching goal of the present study is to investigate the mediational role of symptoms of anxiety in the relationship between perceived discrimination and chronic health problems. Furthermore, I examine the role of health promoting behavior and religiosity in this hypothesized relationship.

Perceived Discrimination and Chronic Health Problems

A considerable amount of research has been conducted on perceived discrimination as a stressor that can have deleterious effects on health outcomes particularly for African Americans (Williams, 2002; Williams, Neighbors, & Jackson, 2003; Williams & Mohammed, 2009). African Americans have been found to disproportionately suffer from stress related diseases and illnesses compared to their European American counterparts (Feldman & Fulwood, 1999; Williams, Neighbors, & Jackson, 2003). With regard to African American women, research has shown that this population experiences high levels of distress in comparison to European American women and African American male samples (Greer, 2008). The literature has emphasized the notion that African American women in particular may experience

discrimination doubly due to both perceived racism and perceived sexism (e.g., Krieger et al., 1993; Settles, 2006). This combined effect of possible stressors could provide insight into the reasoning for the health disparities among African American women.

Despite the abundance of research that has been conducted assessing perceived discrimination, the implications of the findings are inconsistent and many of the studies examining perceived discrimination and health outcomes have significant or conditional findings that warrant further investigation (Cozier et al., 2006; Matthews et al., 2005). For example, Williams, Neighbors, and Jackson's (2003) review indicated that among the eleven studies that examined self-report indicators of health status as an outcome of perceived discrimination, six studies revealed significant associations to discrimination, two studies reported significant, but conditional associations, and three reported no association. A possible reason for these inconsistent findings are small sample size, variability in measurement of perceived discrimination and health status between studies, and a lack of control for other confounding factors such as negative life events and socioeconomic status (Williams, Neighbors, & Jackson, 2003). Yet a critical concern is also that none of these studies that look at the relationship between perceived discrimination and health outcomes have examined the mechanisms or plausible pathways by which this relationship occurs.

Perceived discrimination has also been studied with regard to its impact on specific types of physical health problems, such as hypertension, self-reported poor health, breast cancer incidence, as well as potential risk factors for disease, such as obesity, high blood pressure, and substance use (Pascoe & Richman, 2009; Williams & Mohammed, 2009). However, few studies (Gee et al., 2007) have considered the accumulation of chronic illness that may be linked to perceived discrimination. Chronic and continuous stress is said to exist in the form of daily

hassles (Landrine & Klonoff, 1996; Lazarus and Folkman, 1984). By acknowledging that perceived discrimination is seemingly considered daily hassles in the lives of many African Americans, the risk for this population to experience the deleterious effects on health needs to be further examined.

As health outcomes linked to discrimination have also been characterized as a reaction to stress (Clark et al., 1999), it is essential to understand how the social stressor of racism can lead to dire chronic illnesses. Research has shown that the continuous stress from perceived racial discrimination can invoke physiological changes within body systems (Mays, Cochran, & Barnes, 2007; Clark et al., 1999). In understanding the biological fight or flight response when experiencing challenges such as racism, Mays and colleagues (2007) propose that chronic stressors such as racial discrimination can trigger allostasis, the body's systematic way of achieving homeostasis. The process of allostasis is said to be adaptive in the short term, but chronic long-term experience of allostasis can lead to eventual damage to the body's regulatory systems that prohibits efficient responding to daily demands, which potentially leads to vulnerability and risk for chronic disease outcomes (McEwen 2002, 2004). The hypothalamic-pituitary-adrenocortical (HPA) axis has also received considerable attention given dysregulation that is associated with psychosocial stressors (Horsten et al., 1999; Kapuku, Treiber, & Davis, 2002; Miller, Chen, & Zhou 2007; Pascoe & Richman, 2009). The cortisol hormone that is released through the HPA axis is seen as a significant factor through which chronic stressors influence dysregulation (e.g., increased blood pressure and decreased heart rate variability) of biological systems and bring about disease (Horsten et al., 1999; Kapuku, Treiber, & Davis, 2002; Miller, Chen, & Zhou 2007). Given that chronic diseases tend to progress and involve an increasing number of body systems over time and can be causing damage unbeknownst to the

individual sufferer, examination into the relationship between perceived racial discrimination and chronic health problems is warranted.

Anxiety, Perceived Discrimination, and Chronic Health Problems

Clark and colleagues (1999) point out the importance of perception in potentially racist events, as an individual's perception of a stimuli can elicit coping responses that potentially lead to demands of both psychological and physiological stress responses.

Therefore, what makes perceived discrimination particularly debilitating is the uncertainty associated with the stressful event. Brondolo et al. (2003) report that symptoms of anxiety and distress may increase the tendency to perceive situations as threatening and also racist. One key component that may link perceived discrimination to symptoms of anxiety is the lack of control and also worry associated with when an individual might experience racial discrimination in their daily life.

Lazarus and Folkman's (1984) stress and coping model proposes that a primary component that leads to negative health outcomes is not the stressor alone, but rather the appraisal and coping mechanisms an individual employs in response to the stressor. Vines and colleagues' (2006) investigation of African American women's response to stressors revealed that African American women with the greatest perceived level of exposure to racism demonstrated higher levels of passive emotional and behavioral coping responses. Additional model formulations indicate a pathway whereby stressors lead to negative emotional states, which in turn can lead to psychiatric illnesses such as anxiety and depression (Cohen et al., 1995). A growing body of research studies has found that perceived discrimination could be psychologically harmful in a number of domains including anxiety, depression, well-being, and psychological distress (Paradies, 2006, Pascoe & Richman, 2009; Williams, Neighbors, &

Jackson, 2003). Research reviews and meta-analyses indicate that non-specific distress and depression are the most commonly assessed symptoms of stress due to perceived discrimination effects on psychological health. Very few studies have looked specifically at symptoms of anxiety's relationship to perceived discrimination in African American populations (Kessler, Mickelson, & Williams, 1999; Soto, Dawson-Andoh, & BeLue, 2011; Utsey, & Payne, 2000). Williams, Neighbors, & Jackson's (2003) review indicated that a critical need of future research is to examine the specific mechanisms, which may include psychological factors of anxiety and depression, by which perceived discrimination negatively affects health. No known studies have looked at anxiety as a potential mechanism between perceived discrimination and chronic health problems for African American populations.

Pascoe & Richman's (2009) meta-analysis found results that supported their model whereby increased levels of perceived discrimination are associated with more negative mental and physical health. Considering that stress responses are both physiological and psychological, Pascoe & Richman (2009) emphasized the importance of examining the interrelationship and coactive nature of perceived discrimination's influence on both psychological and physical health outcomes. Kubzansky et al. (1997) found that worry, an important component of anxiety, may increase the risk of coronary heart disease in their research sample of men. Symptoms of anxiety have also been found to be related to health conditions, whereby indicators of anxiety provide indicators for the development/exacerbation of health problems (Karaigi et al., 1990). Hunter and Schmidt (2010) propose that given the somatic nature of symptoms of anxiety, African Americans in particular may be influenced by the "salience of physical illness" or the heightened attention to the perceived threat of physical illness in the interpretation of anxiety pathology. Additionally, Kessler et al. (1999) found that African American women were more

likely to experience anxiety symptoms and associate these symptoms with every day perceived discrimination in comparison to African American men, European American men, and European American women. As symptoms of anxiety are considered to be composed of both cognitive and somatic components (Chapman et al., 2009; Ginsburg & Drake, 2002), it seems that a logical next step is to examine how symptoms of anxiety may influence the relationship between perceived discrimination and chronic health outcomes. Since the elevated rates of chronic health conditions for African Americans are well documented (American Heart Association, 2007; Wong, Shapiro, Boscardin, & Ettner, 2002; U.S. Department of Health and Human Services, 2000), and African American women may experience multiple sources of stress due to perceived discrimination (Geronimus, 1992; Greer, 2008), it appears particularly vital to examine how symptoms of anxiety may be a mechanism influencing the relationship between perceived discrimination and chronic health conditions for this population. To date however, no known studies have examined this relationship.

Health-Promoting Behaviors

With the nonexistence of a viable cure for chronic illnesses, examining potential protective factors for the relationship between perceived discrimination, symptoms of anxiety, and chronic illnesses is essential in order to understand resiliency and effective prevention strategies. An accumulating body of evidence seems to suggest the importance of healthy behavior to prevent chronic illness and disease (Baumann, Chang, & Hoebeke, 2002; Flegal et al., 2002). Health-promoting behaviors have been defined in a number of ways, but broadly, Pender (1987) conceptualizes health-promoting behaviors as those behaviors that an individual engages in, inherently driven by personal desire, that leads to greater quality of health. Therefore, health-promoting behaviors can be viewed as a proactive avenue to improve health status and

well-being (Baumann, Chang, & Hoebeke, 2002; Obarzanek, 2007).

Physical activity and exercise have been found to be protective against chronic illnesses such as hypertension, diabetes, and cardiovascular health problems (Obarzanek et al., 2007). Yet according to the Centers for Disease Control and Prevention and the American College of Sports Medicine (Pate et al, 1995), only approximately 40% of African Americans in the U.S. are meeting the guidelines and recommendations for physical activity participation. Moreover, African American women have been found to have poorer nutritional habits (i.e. eating fewer fruits and vegetables) in comparison to European American women and other diverse groups (Flegal et al., 2002). Despite data denoting the necessity to improve health outcomes for African Americans, their remains relatively little research examining health promoting behaviors specifically for African Americans (Belgrave et al., 1991; Walden, 1994).

Although many health promoting behavior prevention programs seem to target individual choice as the primary motive for an individual not to engage in health promoting behaviors, other researchers discuss the need to examine how environmental and social stressors plays a role in health behaviors (Cohen et al., 1995). Qualitative and exploratory analyses conducted by Walcott-McQuigg (1995) found that life stressors including perceived racism and sexism hampered weight-control behavior in their sample of African-American women caregivers. Additionally, a study by Jones, Tucker, & Herman (2009) examining health-promoting nutrition behavior among African American women who are at risk for or diagnosed with hypertension and/ or related health conditions found that the more self-reported levels of behavioral stress (i.e. easily startled, smoking) that a participant endorsed the less likely they were to engage in health promoting nutrition behavior. In light of these findings, it appears that health-promoting behaviors may play an impactful role both psychologically and physically, especially for African

American women, when taking into consideration societal and environment stressors such as perceived discrimination. Therefore taking an approach of examining within-group differences may shed light on potential protective effects of engaging in health promoting behavior in the relationship of perceived discrimination, symptoms of anxiety, and chronic health problems.

Religiosity

In addition to health promoting behaviors, the cultural influence of religiosity may also serve as a protective factor for African Americans. Research has shown that religiosity and spirituality serve as buffers against negative psychological and physical health consequences (Bowen-Reid & Harrell, 2002; Lewis-Coles & Constantine, 2006; Mattis, 2002, Williams et al. 1991). Theoretically, Pargament (1997) indicated that religious coping may serve as an influential role in the way that a stressor is appraised or interpreted. As previous research findings indicate that African Americans more frequently practice religious and/or spiritual coping strategies when faced with stressors (Ellison & Taylor, 1996; Mattis 2002), analyzing how religiosity influences symptoms of anxiety and chronic health outcomes with the stressor of perceived discrimination might provide insight to culturally relevant strategies for intervention techniques.

Mattis (2002) explored the ways in which African American women used religion/spirituality to cope with stressors, and found that religion/spirituality can help individuals accept as well as confront their reality of societal stressors. Lewis-Coles & Constantine (2006) found that African American women who endorsed higher levels of institutional racism-related stress also endorsed greater use of religious and spiritual-centered coping strategies. As research findings indicate that greater race-related stress leads to greater engagement in religious coping, Bowen-Reid & Harrell (2002) also found that spirituality served

as a buffer between racial stress and negative psychological health outcomes. Possibly in the face of perceived discrimination, African Americans will experience less symptoms of anxiety if they use religious coping strategies. Furthermore with physical health, Williams et al. (1991) found in a community sample that religious attendance buffers the harmful effects of stress and physical health problems on psychological well-being. Conceivably, in aggregation of current research findings, religion can possibly buffer against negative psychological and physiological reactions to discrimination (i.e. symptoms anxiety) as well as potentially deter the path by which stressful effects of perceived discrimination can lead to chronic health conditions.

Present Study

The overarching goal of this study is to examine anxiety as an influential factor in the relationship between perceived discrimination and chronic health problems for African American women. I first investigate the potential relationship between perceived discrimination and chronic health problems. Secondly, I examine the potential meditational role of non-specific symptoms of anxiety in the relationship between perceived discrimination and chronic health problems. I also explore the possible protective nature of health promoting behaviors and religiosity as influential factors in the pathway of perceived discrimination's relationship to chronic health problems. Given the likely influence of negative life events, age, and socioeconomic status (Pascoe & Richman, 2009; Williams, Jackson, & Neighbors, 2001; Williams et al., 2010), I will take these factors into account in examining potential relationships. The specific hypotheses are as follows:

1) Controlling for negative life events, age, and socioeconomic status, perceived discrimination will be related to chronic health problems such that the more perceived discrimination one endorses the more chronic health problems will be reported.

2) Nonspecific symptoms of anxiety will mediate the relationship between perceived discrimination and chronic health problems such that the more symptoms of non-specific anxiety that a person endorses the more chronic health problems will be reported.

3)

   a. Health promoting behaviors will moderate the relationship between perceived discrimination and non-specific anxiety such that the relationship between perceived discrimination and symptoms of non-specific anxiety is significant only for those who do not engage in health promoting behaviors.
   b. Health promoting behaviors will also moderate the relationship between non-specific anxiety and chronic health problems such that the relationship between non-specific anxiety and chronic health problems is significant only for those who do not engage in health promoting behaviors.

4)

   a. Religiosity will moderate the relationship between perceived discrimination and non-specific anxiety such that the relationship between perceived discrimination and symptoms of non-specific anxiety is significant only for those who do not engage in religious practices.
   b. Religiosity will also moderate the relationship between non-specific anxiety and chronic health problems such that the relationship between non-specific anxiety and chronic health problems is significant only for those who do not engage in religious practices.

METHODS

The hypotheses for the current study were tested using sample participants from Wave 4 of the longitudinal Family and Community Health Study (FACHS), a multisite and non-clinical study of neighborhood and family effects on health and development. Participants were recruited from rural, suburban, and metropolitan communities. A total of 897 African American families, 475 in Iowa and 422 in Georgia, were recruited for participation in FACHS. Participants were 646 African American women, all of whom were the primary caregiver for a 10- to 12-year-old child.

The mean age of the sample was 37.1 years (SD = 8.18) and ranged from 23 to 80 years. At wave 1, the primary caregivers' educational backgrounds ranged from less than a high school diploma (19%) to a bachelor's or advanced degree (10%); the majority of participants (71%) were high school graduates. Their educational attainments changed little across the duration of the study. The mean family income across the three waves of data collection was $33,120; across the 5 years that separated the first and third waves, family income increased by an average of 12%.

Procedure

A central goal of the larger study was to investigate the effects of neighborhood characteristics on the functioning of adults and children. Thus, families were recruited from neighborhoods that varied on demographic characteristics, specifically racial composition (percent African American) and economic level (percent of families with children living below the poverty line). In selecting neighborhoods from which to draw the sample, neighborhoods for

which the population represented various levels of economic status were identified via U.S. Census Bureau data. The specific census group data were characterized as "block group areas" (BGAs) or clusters within a tract defined by the Census Bureau. Using 1990 census data, block group areas (BGAs) were identified in both Iowa and Georgia in which the percent of African American families was high enough to make recruitment economically practical (10% or higher) and in which the percent of families with children living below the poverty line varied widely. Within each BGA, community members who agreed to serve as liaisons between the University of Georgia researchers and the neighborhood residents were identified. These community liaisons compiled rosters of children within each BGA who met the sampling criteria. In addition to their own direct knowledge, the liaisons used information from parents, teachers, pastors, youth groups, and community organizations in compiling the rosters. Families were then randomly selected from these rosters and contacted to determine their interest in participating in the research project. Families who declined participation were removed from the rosters; other families were randomly selected until the required number of families from each BGA had been recruited.

In FACHS, the field researchers were all African American students and community members who received one month of training in the administration of the self-report measures. Eight focus groups in Georgia and Iowa were coordinated to critically evaluate the study's self-report measures before data collection was initiated. All materials were administered as an "interview" in which the researcher read the questions to the participant in a private room in the participants' homes. Each participant was provided a consent statement for endorsement and informed that participation in the study could cease at any time.

Measures

Demographic Questionnaire. Demographic variables included participant age, education, and marital status. Although it would have been desirable to include income as a demographic variable, a large number of participants refused to answer some or all of the income questions. Rather than imputing missing values (Sterne et al., 2009), the investigators chose to rely on education as an index of SES.

Non-Specific Anxiety (Mini-MASQ). Non-specific anxiety was assessed with the subscale from the Mini-Mood and Anxiety Symptom Questionnaire (Mini-MASQ; Casillas & Clark, 2000). The three-item general distress-anxiety subscale assesses nonspecific symptoms of anxiety. All items asked about the intensity of each symptom in the past week. Sample items included "How much have you felt tense or "high strung" and "How much have you...felt uneasy?" The Mini-MASQ was developed in the U.S. in healthy community samples of low-income African American adults and college students, to be used as a measure of psychological well-being in a community study of lower income families (e.g., Cutrona et al., 2000). Cronbach's alpha = .76.

Perceived Discrimination. The Experiences of Discrimination Scale is a modified version of the Schedule of Racist Events (Landrine & Klonoff, 1996). The scale was developed for use with the FACHS to assess perceived racial discrimination for the African American parents. The revised scale contains 13 items concerning negative experiences attributable to being African American (e.g., "How often have you been treated unfairly because you are African American?" "How often has someone treated a member of your family unfairly because they were African American?"). Respondents rated each item on a 4-point Likert scale that ranged from 1 (never) to 4 (several times). Higher scores are indicative of more perceived discrimination. Sample items

included, ‘‘someone said something insulting to you because you are African American,’’ ‘‘a store owner or sales person working at a business treated you in a disrespectful way because you are African American,’’ and ‘‘you encountered Whites who didn’t expect you to do well because you are African American.’’ In a cross validation analysis of the SRE (Klonoff & Landrine, 1999) African American women were found to report racism less frequently than men. Klonoff & Landrine’s (1999) factor analysis also revealed that reliability and validity co-efficients were high and were similar to those reported in previous studies. Cronbach’s alpha = .93.

Chronic Health Problems. Chronic Health Problems was assessed via ”yes-no” inquiry of participants' specific diseases, impairments, and disabilities (e. g., “Has a doctor ever told you that you were suffering from diabetes?”). During questionnaire assessment, the participants were asked to endorse up to 27 chronic health conditions (see Table 1). Items that were endorsed by < 2% of the sample (i.e., Tuberculosis, Parkinson’s disease, Multiple Sclerosis, Speech Impediment) were omitted in order to decrease the variance of endorsed items and to be more representative of the population under study (cf. Cohen, Kessler, & Gordon, 1995). As a result, the final list of possible health problems totaled 23.

Health Promoting Behaviors. Health Promoting Behaviors was assessed using a 6-item questionnaire developed for the FACHS community participants to measure self-reported frequency of health-promoting behaviors. Respondents rated each item on a 4-point Likert scale that ranged from 1 (never) to 4 (regularly). Higher scores were indicative of participating in more health promoting behaviors. Sample items included, “how often do you exercise?”, “how often do you eat fatty foods like potato chips or ice cream?”, and “how often do you watch what you eat?” The item of “how often do you diet to lose weight?”” was removed due to inconsistency with other items. Cronbach’s alpha = .49.

Religiosity. Using a revised version of Jessor's Value on Religion Scale (Jessor & Jessor, 1977), an index to assess the extent to which the participants relied on their belief and faith in God as a source of meaning and inspiration was developed for the FACHS community dataset. Respondents were asked to rate the importance of believing in God, relying on religious teaching when you have a problem, to be able to turn to prayer when you're facing a personal problem, and to rely on your religious beliefs as a guide for day-to-day living. A sample item included, "In general, how important are religious or spiritual beliefs in your day-to-day life?" The internal consistency ranged from .78 to .81 over assessments (Murry et al., 2008). Cronbach's alpha = .76.

Negative Life Events. Negative Life Events (Conger, & Elder, 1994) consisted of 32 items that included a number of relatively severe, chronic stressors that people may have experienced during the previous 12 months. The measure includes events such as criminal victimization, serious illness or injury to oneself or an immediate family member, legal problems, the death of a loved one, and marital separation or divorce. Sample questions included, ''In the past 12 months, did any close friend or close relative die?'' and ''In the past 12 months, did you have a son or daughter involved with an unwanted pregnancy?''

RESULTS

Descriptive Statistics

Means, standard deviations, and intercorrelations for all measures are presented in Table 1. In all analyses age, negative life events, and education were entered as covariates. Age was significantly correlated with the number of endorsed chronic health problems, while education was significantly related to perceived discrimination. Consistent with my first hypothesis, perceived discrimination was significantly correlated with chronic health problems in the expected direction ($r = .12$, $p < .01$), such that African American women who reported more perceived discrimination were more likely to endorse experiencing more chronic health problems. In addition, respondents who endorsed experiencing more perceived discrimination were more likely to experience more symptoms of non-specific anxiety ($r = .22$, $p < .01$) and also endorse more chronic health problems ($r = .27$, $p < .01$). Health promoting behaviors was unexpectedly found to have a significant positive correlation with both perceived discrimination ($r = .11$, $p < .01$) and chronic health problems ($r = .07$, $p < .10$) such that as perceived discrimination increased so did health promoting behaviors. Religiosity was also unexpectedly found to have a significant positive correlation with perceived discrimination ($r = .08$, $p < .05$).

Overview of Data Analyses

Prior to the analyses, all continuous measures were mean-centered (Aiken & West, 1991). In each analysis I also controlled for age, negative life events, and education. I used Preacher et al. (2007) SPSS macro and bootstrapping procedures provided by the authors to conduct the analyses. This macro facilitates the implementation of the recommended

bootstrapping methods of a bias-corrected 95% bootstrap confidence interval using 5,000 bootstrap samples.

Nonspecific anxiety, discrimination, and chronic health problems:

Hypothesis two predicted that non-specific anxiety mediated the relationship between perceived discrimination and chronic health problems. Given the zero-order bivariate correlations between perceived discrimination, non-specific anxiety, and chronic health problems, the proposed mediational analyses were conducted. Results of the SPSS macro indicated that non-specific anxiety significantly mediated the relationship between perceived discrimination and chronic health problems ($\beta = 2.73$, SE = .45, CI = .00, .04).

Religiosity:

The moderated mediation procedure examined if the mediating effect of anxiety was moderated by religiosity. This was tested at the path from perceived discrimination to non-specific anxiety and the path from non-specific anxiety to chronic health problems. The analyses indicated that religiosity did not significantly moderate perceived discrimination on nonspecific anxiety ($\beta = -.00$, SE = .00, $p = .44$), and also did not significantly moderate non-specific anxiety on chronic health problems ($\beta = -.02$, SE = .02, $p = .39$).

Health Promoting Behavior:

The moderated mediation procedure was also implemented to examine if the mediating effect of anxiety was moderated by health promoting behavior. This was tested at the path from perceived discrimination to non-specific anxiety and the path from non-specific anxiety to chronic health problems. The analyses indicated that health-promoting behaviors did significantly moderate perceived discrimination on nonspecific anxiety ($\beta = -.01$, SE = .00, $p <$

.05), but did not significantly moderate non-specific anxiety on chronic health problems (β = .002-.19, SE = .01, p = .83).

DISCUSSION

A main objective of this research was to examine the potential mechanism and process of non-specific anxiety in the relationship between perceptions of discrimination to chronic health problems. Consistent with the hypothesis, African American women in the current sample who perceived more discrimination reported having more diagnosed chronic illnesses. This finding supports the accumulated evidence that, even when controlling for factors such as socioeconomic status and negative life events, the psychosocial stressor of perceived discrimination can have deleterious effects on physical health outcomes (Williams, 2002; Williams, Neighbors, & Jackson, 2003; Williams & Mohammed, 2009). This finding adds to the existing literature by providing evidence that chronic health conditions (i.e. high blood pressure, diabetes, kidney disease) that disproportionally affect African Americans may be substantially influenced by the stress of discrimination.

Previous researchers have criticized the available research for failing to fully examine specific mechanisms in the pathways by which perceived discrimination negatively affects health outcomes (Williams, Neighbors, & Jackson, 2003). These researchers suggest that negative emotional states, such as anxiety and depression, are potential mechanisms that need to be examined in future research. The current research findings provide theoretically driven evidence for the role of psychological factors, such as non-specific anxiety, as a mechanism influencing the pathways by which perceived discrimination relates to chronic health outcomes. McEwen (2004) notes that prolonged stress leading to allostatic load cannot only cause physiological changes in the body but also potentially lead to chronic anxiety disorders. There is also a

growing body of literature examining symptoms of anxiety's relationship to somatization and physical health outcomes (Hunter & Schmidt, 2010; Karaigi et al., 1990). There are several reasons why researchers should attend to anxiety pathology, yet no known studies have examined the mechanism of anxiety influencing the relationship between perceived discrimination and chronic health conditions for African American women.

The current study findings indicated that symptoms of anxiety act as a mediator in the association of perceived discrimination to chronic health outcomes. Williams & Mohammed (2009) review indicated that the negative physiological effects of exposure to stressors, such as perceived discrimination, are often triggered by the initial perception of a threat even long before the actual exposure to the stressor occurs. Further research examining anticipatory stress emphasizes that worry, intrusive thoughts, and hypervigilence all contribute to the unique aspects of psychophysiological responses to racial discrimination and negative health outcomes (Carter, 2007; Harrell, Hall, & Taliaferro, 2003; Williams & Mohammed). Additionally in Brosschot, Gerin, and Thayer's (2006) review, they utilize the term "perseverative cognition" in conceptualizing symptoms of anxiety and anticipatory stress as cognitive processes that can lead to "prolonged physiological activation." This prolonged physiological activation is said to be due to one or more psychosocial stressors and is a risk factor for dysregulation of both psychological and physiological functioning leading to disease conditions. My research findings highlight the potential vital role of symptoms of anxiety in the process that occurs from an individual's perception of discrimination to reported chronic health outcomes. This research further denotes the importance of conceptualizing anxiety as having both psychological and physiological components that can lead to negative outcomes.

The association for racial discrimination to health outcomes even as mediated by anxiety

symptoms is multi-determined. As a result, religiosity and health promoting behaviors were examined as potential protective factors that could influence non-specific anxiety's mediational role. Although religiosity seems to have many buffering capacities, I did not attenuate anxiety's mediating capacity as measured in the current study. Health promoting behaviors was found to significantly moderate anxiety's mediating role at the pathway from perceived discrimination to symptoms of anxiety. This finding suggests that engaging in health promoting behaviors could exert some "downstream" influence on chronic health outcomes whereby the anxiety response to discrimination is offset. Health promoting behaviors such as exercising and eating healthy foods has been found to serve as a proactive avenue to improve physical well being (Baumann, Chang, & Hoebeke, 2002; Obarzanek, 2007). Though exercise is known to directly increase endorphins, it may also serve a coping function" (Harris, Cronkite, & Moos, 2006; Steptoe et al., 1989).The current research findings expands on previous work, by showing that engaging in health promoting behaviors can possibly reduce symptoms of anxiety experienced by perceived discrimination, which furthermore influences chronic health outcomes for African American women. These findings also highlight when health promoting behaviors could be potentially preventative to negative outcomes in the proposed pathway model. The current findings suggest that health promoting behaviors may be beneficial for the initial perception of discrimination in order to decrease the levels of anxious symptoms and chronic health outcomes experienced due to this stressor. Yet after the stressor of perceived discrimination leads to the experience of anxiety symptoms, engaging in health promoting behaviors could not be as effecting in decreasing chronic health outcomes. The current findings suggest engaging in health promoting behaviors before the stress related effects of perceived discrimination can lead to increased levels of anxiety. Once increased levels of anxiety are experienced due to the psychosocial stressor of

perceived discrimination, the results indicated that health promoting behaviors such as exercising may be ineffective in reducing chronic health problems for this population sample.

Study Limitations and Future Directions

Although this study makes several preliminary contributions to the available literature, some potential limitations should be noted. First, the results are based on cross-sectional data. As such, no causal associations regarding the perceived discrimination, non-specific anxiety, and chronic health outcomes relationships can be concluded. Future studies might employ a prospective design to examine the complex associations and mediational role of anxiety such that the negative effects of perceived discrimination can be understood further over the life course. Second, the current study was conducted only with African American women who were recruited to the larger study given their roles as primary caregivers. Though the participants represent a large sample, their relatively targeted recruitment may affect the generalizability of the current findings. African American men as well as other diverse populations may respond differently to discrimination experiences than African American women. It could be beneficial for future studies to replicate this study with African American men who also experience problems with chronic disease. There is some evidence to support that the frequency and type of perceived discrimination experienced by African Americans may vary based on gender (Kessler et al., 1999; Sellers & Shelton, 2003). For example, Kessler (1999) found that men were nearly twice as likely as women to report frequent day-to-day perceived discrimination. As a third potential, I analyzed only non-specific symptoms of anxiety and not clinical diagnoses of anxiety such as generalized anxiety disorder, social phobia, or post-traumatic stress disorder. It is possible that the current results would be different in a clinical sample such that populations with clinically significant levels of anxiety may perceive more experiences of stress due to perceived

discrimination. Carter (2007) notes the significance of perceived discrimination's relationship to Post-Traumatic Stress Disorder and trauma and the need to explore this relationship further due to diverse populations showing higher levels of PTSD than European Americans.

While the primary dataset provided an important opportunity to test unique relationships worthy of examination the measures of discrimination, non-specific anxiety, religiosity, and health promoting behaviors posed some limitations. The perceived discrimination measure used in this study was a lifetime measure of self-reported discriminatory experiences, which highlights the cumulative nature of the stress responses to discrimination on chronic health problems. Yet this study does not examine acute or relative recency of experiences of discrimination that could possibly affect psychological and physiological responses. The non-specific anxiety measure used in this study had a limited number of items, so it may not fully capture symptoms of anxiety that may be experienced due to perceived discrimination. The religiosity measure utilized for this study potentially did not measure multiple dimensions of this construct (i.e. cognitions, affect, behaviors), which could impact current findings. The measure of health promoting behavior demonstrated limited reliability which may have influenced the unexpected bivariate correlations with the measures of perceived discrimination and chronic health problems. Therefore I cannot be confident that this measure adequately assessed the proposed construct or that the current moderational results found for health promoting behaviors support the hypothesized moderated mediational model. Fifth, coping and reappraisal processes were not examined in this study. As research has shown that worry and anxiety are frequently reactions to racial discrimination that prompt aggressive, passive, or defensive responses (Brondolo et al., 2009; Harrell, Hall, & Taliaferro, 2003), it would be interesting for future

studies to examine how these responses impact the mediational role of anxiety on the relationship between perceived discrimination and chronic health problems.

Conclusion

Overall, the current findings may have some important implications for research, prevention, and intervention strategies. The results are among the first to demonstrate a specific pathway by which discrimination is potentially related to chronic health outcomes for African American women. Furthermore, this study is one of the first to examine the protective role of religiosity and health promoting behaviors in a pathways model approach. Racial disparities in the United States continue to be pervasive and persistent over time. Research examining pathways where health can possibly be restored and preserved is vital (Williams et al., 2010). Also research that looks at these factors is important since the cause for the disparate rates of many chronic diseases between African Americans and other groups is poorly understood. Only future research on this topic will provide a more in-depth and comprehensive understanding of the psychosocial stressors that can affect disease, life expectancy, and death for African American populations.

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Table 1.

Means, Standard Deviations, and Zero-Order Correlations Among Measured Variables (n = 646).

	1	2	3	4	5	6	7	8	*M*	*SD*
1. Perceived Discrimination	1								23.54	8.52
2. Non-Specific Anxiety	.22**	1							4.24	1.43
3. Chronic Health Problems	.12**	.27**	1						2.48	2.52
4. Religiosity	.08*	-.07$^{\#}$	-.02$^{\#}$	1					8.40	2.99
5. Health Promoting Behaviors	.11**	-.05	.07$^{\#}$	.10**	1				15.22	2.95
6. Negative Life Events	.21**	.27**	.26**	-.01	.04	1			2.01	1.99
7. Age	.09*	.02	.26**	.00	.18**	.01	1		36.54	7.16
8. Education	.13**	.04	-.05	.09*	.15**	.04	.02	1	12.41	2.18

$^{\#}p < .10$. *$p < .05$. **$p < .01$.

Table 2.

Test of Moderated Mediation- Religiosity Moderator

Predictors	β (SE)	*t*	*p*
Mediator variable model (Non-Specific Anxiety)			
Religiosity	0.10 (0.06)	1.66	.10[#]
Discrimination	0.03 (0.01)	4.31	.00**
Discrimination X Religiosity	-0.01 (0.03)	-2.45	.01**
Dependent variable model (predicting chronic health problems)			
Religiosity	0.15 (0.13)	1.16	.25
Discrimination	0.00 (0.01)	0.31	.75
Discrimination X Religiosity	-0.00 (0.00)	-0.77	.44
Non-specific Anxiety X Religiosity	-0.02 (0.02)	-0.87	.39

[#]$p < .10$. *$p < .05$. **$p < .01$.

Table 3.

Test of Moderated Mediation- Health Promoting Behaviors Moderator

Predictors	*β* (SE)	*t*	*p*
Mediator variable model (Non-Specific Anxiety)			
Health Promoting Behaviors	-0.05 (0.07)	-0.83	.41
Discrimination	0.03 (0.07)	4.55	.00**
Discrimination X Health Promoting Behaviors	-0.00 (0.00)	-0.15	.88
Dependent variable model (predicting chronic health problems)			
Health Promoting Behaviors	0.10 (0.14)	0.74	.46
Discrimination	0.01 (0.01)	0.57	.57
Discrimination X Health Promoting Behaviors	-0.01 (0.00)	-2.08	.04*
Non-specific Anxiety X Health Promoting Behaviors	-0.04 (0.03)	1.40	.16

$^{\#}p < .10$. $*p < .05$. $**p < .01$.