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Positive and Negative Religious Beliefs Explaining the Religion–Health Connection Among African Americans

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Abstract

Theory and literature suggests that the reason religiously-involved people tend to have good health outcomes is because they have healthy lifestyles and behaviors in accord with religious beliefs. Other literature suggests that religious involvement may play a negative role in health outcomes due to beliefs about illness originating as punishment for sins. These ideas were tested as part of a theoretical model of the religion-health connection, in a national sample of African Americans. Outcomes included a variety of health-related behaviors. Study participants (N=2,370) randomly selected from a US national call list completed a telephone survey assessing religious involvement, health behaviors, and demographic characteristics. Structural equation modeling was used to analyze study data. Findings indicate that perceived religious influence on health behavior mediated the relationship between religious beliefs and behaviors and higher fruit consumption, and lower alcohol use and smoking. Belief that illness is the result of punishment for sin mediated the relationship between 1) religious beliefs and higher vegetable consumption and lower binge drinking; and 2) religious behaviors and lower vegetable consumption and higher binge drinking. These findings could be applied to health education activities conducted in African American faith-based organizations such as health ministries, in the effort to eliminate health disparities.

Keywords

Religion; Religious beliefs; Punishment; African Americans; Health behaviors

Research has extensively examined the relationship between religious involvement, referring to “an organized system of [religious] beliefs, practices, rituals, and symbols” (Thoresen, 1998, p. 415)”, and a wide variety of physical and mental health outcomes (Koenig, McCullough, & Larson, 2001). These relationships are generally agreed to be positive in nature (see Ellison, Hummer, Burdette, & Benjamins, 2010; Koenig, King, & Carson, 2012 for reviews), though some evidence of negative aspects of religious involvement and impact

on health have been noted as well (Exline, 2002; Mitchell, Lannin, Mathews, & Swanson, 2002; Pargament, 2002; Pargament, Koenig, Tarakeshwar, & Hahn, 2001). Additionally, these relationships are particularly relevant for segments of the population high in religiosity, such as African Americans (Krause, 2002), who tend to have greater religious involvement than other groups (Levin, Taylor, & Chatters, 1994; Taylor, Chatters, Jayakody, & Levin, 1996). This population suffers a notable burden of chronic disease and other health problems (Pleis & Lethbridge-Çejku, 2007), including but not limited to cardiovascular disease, hypertension, diabetes, and cancer. Such conditions have often been found to be negatively associated with religious involvement (see Koenig et al., 2012 for review). An overarching goal of Healthy People 2020 is to attain health equity and eliminate health disparities, in which a health outcome occurs to a greater or lesser degree in a particular group (U.S. Department of Health and Human Services, 2010). Learning more about how religious involvement is connected to health can better inform interventions aimed at health disparities reduction, including faith-based programs, and efforts to increase cultural competence/humility among practitioners.

Theoretical Foundations

There have been several efforts, mainly through systematic reviews, to document why the relationship between religious involvement and health-related outcomes exists, or to identify the mediators/mechanisms of the religion-health connection. One review included mechanisms such as lifestyle/health behavior, social support, positive self-perceptions, coping, positive emotions, and healthy beliefs (Ellison & Levin, 1998). Religious involvement was proposed in another review to impact physical health through healthy lifestyle and social support (Musick, Traphagan, Koenig, & Larson, 2000). In a review focusing on longitudinal studies in this area, it was concluded that most have included mechanisms of healthy lifestyle, social support, self-esteem/self-efficacy, and sense of meaning (George, Ellison, & Larson, 2002).

In their updated review, Koenig and colleagues (2012) provide hypothetical causal models of the religion-health connection. A Western model is described from a largely Christian context. In this model, multidimensional religion/spirituality (e.g., public, private, coping, etc.) leads to psychological traits such as self-discipline, patience, and forgiveness. These in turn lead to emotional states (positive/negative) and social connections, which impact physiological function, and finally health. An Eastern model follows, which is largely the same as the Western, except that rather than the religion/spirituality stemming from belief in God, the source is Brahman or Buddha. Finally, a secular model is proposed, in which the root source is self and community, which leads to a multidimensional concept including but not limited to public good, ethics, and justice, and the remainder of the model is the same as the others. Taken together, most models of the religion-health connection recognize the importance of a higher power and some form of multidimensional religious involvement, which lead to a set or series of mediators including but not limited to psychological traits and support from others, which ultimately impacts health outcomes. The next section describes two mediators of interest that were identified based on the aforementioned theoretical models.

Perceived religious influence on health behavior

Proposed theoretical models commonly reflect the idea that religiously involved people are healthier because they engage in healthy lifestyles in accord with their religious beliefs. This perceived religious influence on health behavior (Holt, Clark, et al., 2009) may include avoiding behaviors such as drinking alcohol excessively, risky sexual practices, using illegal drugs, or tobacco use (Ellison & Levin, 1998; George et al., 2002; George, Larson, Koenig, & McCullough, 2000; Levin & Vanderpool, 1989; Mullen, 1990; Musick, Traphagan, et al., 2000; Strawbridge, Shema, Cohen, & Kaplan, 2001). Such behaviors may reflect religious doctrine, or the general belief that the body is the temple of the holy spirit (George et al., 2000). In the aforementioned review, Koenig and colleagues (2012) list a number of health behavioral pathways through which religious involvement may impact health, including physical activity, diet, weight control, sexual activity, smoking, and screenings. It was concluded that religious involvement may indeed impact physical health through greater engagement in these types of healthy behaviors.

Hill and colleagues (2007) examined whether religious individuals engaged in healthier lifestyles than less religious individuals, using a sample of Texas adults. They confirmed this idea, among both men and women, and across race/ethnic groups. They called for future research to determine whether healthy lifestyles serve as a mechanism whereby religious involvement plays a role in mortality reduction, which is where the current study contributes. Only recently has perceived religious influence on health behavior been operationalized in terms of assessing people's specific beliefs about if/how their religious convictions impact their health behaviors (Holt, Clark, et al., 2009). This enables the assessment of the construct in its mediational role as proposed by the aforementioned theoretical models.

Illness as punishment for sin

Though perceived religious influence on health behavior reflects a positive role of religious involvement in health, not all religious influences are positive/adaptive in nature. An exception is negative religious coping (Pargament, Koenig, & Perez, 2000), which has been the focus of much previous research. Religious coping involves two overall dimensions, positive and negative (Pargament, Feuille, & Burdzy, 2011). Positive religious coping is where an individual has a close relationship with a higher power, is spiritually connected with others, and has a benevolent world view. Negative religious coping involves spiritual struggle with one's self, others, and a higher power. Research suggests that the negative dimension is predictive of health outcomes including mortality (Pargament, Koenig, Tarakeshwar, & Hahn, 2001).

Another negative aspect of religious involvement is the idea that some people believe that illness may be the result of punishment for sins or wrongdoings (Ellison, 1994). People who violate religious norms may experience feelings of guilt or shame, or they may fear punishment from God (Ellison & Levin, 1998). Empirical literature on this specific concept has suggested the idea that serious illness such as HIV may be viewed as being the result of punishment for sin (Crawford, Allison, Robinson, Hughes, & Samaryk, 1992; Kaldjian, Jekel, & Friedman, 1998; Klonoff & Landrine, 1994; Kopelman, 2002; Neylan, Nelson,

Schauf, & Schollard, 1998). These beliefs around punishment may also be relevant in the context of cancer (Burker, Evon, Sedway, & Egan, 2005; Degner, Hack, O'Neil, & Kristianson, 2003; Eidinger & Schapira, 1984; Luker, Beaver, Leinster, & Owens, 1996; Springer, 1994). Instruments to assess beliefs regarding illness as punishment for sin are also rare. Therefore, one was developed specifically for use in testing mediational models of the religion-health connection (Holt, Clark, et al., 2009). The Penn Inventory of Scrupulosity (PIOS) also assess fears about having committed sin and receiving punishment from God, however this instrument is not health-specific and was developed and validated in an undergraduate sample (Abramowitz, Huppert, Cohen, Tolin, & Cahill, 2002).

The Present Study

The purpose of this study was to test a theoretical model of the religion-health connection, to determine whether perceived religious influence on health behavior and illness as punishment for sin played a mediating role in a number of modifiable health behaviors in a national sample of African Americans. Although these two constructs have both been proposed as religion-health mediators, there has been limited empirical research testing their mediational role in health-related outcomes. This may be in part due to the limited availability of ways to assess these complex beliefs relating religious involvement and health. A review of religion and health research among African Americans indicated that few studies have focused on African Americans relative to non-Hispanic Whites (Ellison et al., 2010). African Americans tend to have high levels of religious involvement. They are more likely than other groups to report a religious affiliation, over half report at least weekly service attendance (compared with 39% of the US general population), and almost 80% indicate that religion is important in their lives (compared with 56% of the US general population) (Pew, 2009).

African Americans also suffer a disproportionate burden of health conditions and illness, making this lack of attention particularly unfortunate. Health behaviors play a significant role in the development of chronic disease, which account for 70% of annual deaths (Kung, Hoyert, Xu, & Murphy, 2008). Several key behaviors are linked to longevity through their associations with the most common chronic diseases. These include avoiding excess alcohol use (e.g., men should have no more than 2 drinks per day, and women no more than one); avoiding tobacco; maintaining a healthy diet (e.g., eating fruits/vegetables, and avoiding foods high in fat and sodium); and getting regular physical activity (Ford, Zhao, Tsai, & Li, 2011). Health behaviors are the basis for much of chronic disease and have been the target of health promotion efforts, including many community- and faith-based interventions.

The present study references a Religion-Health Mediational Model, based on a systematic review of the literature on religion/spirituality and health and a program of previous qualitative research (Holt, Clark, et al., 2009; Holt, Lewellyn, & Rathweg, 2005). This model includes a set of constructs widely recognized to be potential mediators of the religion-health connection. The Religion and Health in African Americans, or "RHIAA" study is a national survey designed to test this theoretical model of the religion-health connection, comprised of a series of mechanisms (see Figure 1). Perceived religious influence on health behavior and illness as punishment are examined in the present analysis,

which is part of a larger theory-testing initiative being conducted in the overall RHIAA study. While the current analysis focuses on two of the constructs, it is noted that statistical testing of a comprehensive theory is not feasible in a single analysis. Previous studies have examined other mediators, for example one on positive self-perceptions (e.g., self-esteem; self-efficacy) reporting that both in part mediated the relationship between religious beliefs and greater fruit and vegetable consumption, and lower alcohol use (Holt, Roth, Clark, & Debnam, 2012). Another study with a similar dataset found that religious social support mediated the relationship between religious beliefs and emotional functioning and depressive symptoms among African Americans (Holt, Wang, Clark, Williams, & Schulz, 2013).

Method

Telephone Survey Methods

The RHIAA study data collection methods have previously been reported elsewhere (Holt, Roth, Clark, & Debnam, 2012). A professional sampling firm used probability-based methods to generate a call list of households from all 50 United States, constructed from publicly available data such as motor vehicle records. Trained interviewers selected telephone numbers randomly from this call list, and introduced the project to the adult living at the selected household. If that individual expressed interest, they were screened for eligibility to determine whether they self-identified as African American and age 21 or older, with no cancer history. Cancer diagnosis was an exclusion criterion for the larger RHIAA study that assessed screening data, as those with a previous diagnosis of cancer would be engaged in surveillance rather than screening. Individuals who were interested and eligible listened to an informed consent script and provided their verbal assent to participate. They completed the 45-minute interview and received a \$25 gift card by mail. The study was approved by the University of Alabama at Birmingham and University of Maryland Institutional Review Boards.

Measures

Religious involvement—A validated Religiosity Scale previously used with African Americans assessed religious beliefs (e.g., presence of God in one's life, perceiving a personal relationship with God) and behaviors (e.g., church service attendance, involvement in other church activities) (Lukwago, Kreuter, Bucholtz, Holt, & Clark, 2001). Items are assessed in 5-point Likert-type format, with the exception of two monthly service attendance items that were assessed in 3-point format (0; 1–3; 4+). Scores range from 4–20 for beliefs and 5–21 for behaviors, with higher scores indicating higher religious involvement. Internal reliability of the beliefs ($\alpha=.89$) and behaviors ($\alpha=.73$) subscales was reasonable to high in this sample.

Perceived religious influence on health behavior—The Perceived Religious Influence on Health Behavior scale (Holt, Schulz, & Wynn, 2009) consisted of 7 items (e.g., “I tend to avoid things harmful to my body because of my religious/spiritual beliefs.”; “God helps me to maintain a healthy lifestyle.”; see Appendix A for full scale) assessed in 4-point Likert-type format (strongly disagree, disagree, agree, strongly agree). The scale has a

possible range of 7 – 28, with higher scores indicating higher levels of these beliefs. The internal consistency of the instrument was $\alpha = .87$ in this sample. The average item-total correlation was .46 and ranged from .34 – .62, and test-retest reliability was modest during a two-week interval, $r = .65$, $p < .001$ (Holt, Clark, et al., 2009).

Illness as punishment—The Illness as Punishment for Sin scale was comprised of 8 items (e.g., “God sometimes uses physical illnesses to punish people.”; see Appendix A for full scale) assessed in 4-point Likert-type format (strongly disagree, disagree, agree, strongly agree) (Holt, Clark, et al., 2009). The scale has a possible range of 8 – 32, with higher scores indicating higher levels of these beliefs. The internal consistency of the instrument was $\alpha = .89$ in the present sample. The average item-total correlation was .84 and ranged from .69 – .95, and test-retest reliability was acceptable during a two-week interval, $r = .84$, $p < .001$ (Holt, Clark, et al., 2009).

Health behaviors—An adaptation of National Cancer Institute’s Five-A-Day Survey was used to assess fruit and vegetable consumption (Block et al., 1986). The instrument was previously validated with the study population (Kreuter et al., 2005). Seven items assess fruit consumption and 5 assess vegetable consumption (e.g., In a typical week, about how many times do you have...a piece of fresh fruit, like an apple, orange, banana, or pear). Fifteen different fruits and 18 vegetables are assessed using these items, including “other fruits” and “other vegetables”. The response scale ranges from 0 to 8 or more servings per week. Participants are asked to think about a typical week, and servings per day can be computed by summing all items and dividing by 7. The test-retest reliability (intraclass correlation coefficient) for the both the fruit ($r = .52$, $p < .001$) and the vegetable ($r = .60$, $p < .001$) portions were adequate over a two-week period.

Alcohol and tobacco use were assessed using modules from the Behavioral Risk Factor Surveillance System (BRFSS). This established interview is administered nationally, and has been utilized with the study population. The BRFSS has demonstrated adequate test-retest reliability over a 21-day period among African Americans (Stein, Lederman, & Shea, 1993). The alcohol consumption module includes an initial question on any alcohol use during the preceding 30 days (yes/no). Those who answer “yes,” are asked additional items assessing binge and heavy drinking (“Considering all types of alcoholic beverages, how many times during the past 30 days did you have 4/5 or more drinks on an occasion?”; “During the past 30 days, what is the largest number of drinks you had on any occasion?”). Participants indicate how many days, or how many drinks, respectively. The tobacco use item asks whether the individual smokes cigarettes every day (2), some days (1), or not at all (0).

Demographics—A standard demographic module assessed participant characteristics such as sex, age, relationship status, educational attainment, work status, and household income before taxes.

Statistical Methods

The current analyses were conducted using Mplus (Muthén & Muthén, 1998–2012), applying maximum likelihood estimation methods. Confirmatory factor analysis models

were run first that specified the observed items to be indicators of underlying latent constructs, in a modification of the traditional two-step approach (Anderson & Gerbing, 1988). Second, structural models testing the significance of the mediated and unmediated effects of religious involvement on the health behavior outcomes were conducted. Fit statistics assessed included the root mean square error of approximation (RMSEA) as the primary fit criterion, with an RMSEA of 0.05 or less an indication of excellent fit. Standardized (STDYX) estimates are reported and tested for statistical significance. These standardized estimates represent the change in standard deviation units in the outcome variable that is associated with a 1.0 standard deviation change in the predictor variable.

The general arrangement of the structural models assessed is shown in Figure 2. The mediators of perceived religious influence and illness as punishment were examined in separate models with 6 outcome variables (fruit servings per day, vegetable servings per day, drinking behavior (yes/no), largest number of drinks, number of binge drinking days, and current smoking status) for a total of 12 different structural models. The models for largest number of drinks and number of binge drinking days were analyzed on the subset of participants who reported any alcohol use in the previous 30 days. Across all models, 4 exogenous covariates (age, gender, education, self-rated health status) were included as predictors of the religious involvement independent variables, mediator, and health behavior outcome variable. The standardized estimates from these models corresponding to the mediated and unmediated/direct effects were assessed for statistical significance. These estimates are also effect size measures that were examined across outcome measures to assist in interpretation of findings across the models.

Results

A total of 12,418 people were asked to participate and 2,370 completed the telephone interview. The overall response rate is calculated as accepted/[accepted + non-interviewed], and was 19%. Of individuals contacted but did not participate (N=10,048), 8,240 refused before eligibility could be assessed, 1,658 were not eligible [81 were under age 21, 444 did not provide an age for eligibility screening, 878 did not self-report as African American, 224 reported a history of cancer, and 5 refused to respond to the cancer history question]. Twenty-six individuals were not capable of participating in the interview. Only 150 were eligible but refused, resulting in an upper bound response rate of 94% (2,370/2,520). The upper bound response rate is the most liberal and includes only refusals, terminations, and completed interviews (Centers for Disease Control and Prevention, 1998). Table 1 provides a study sample description.

Measurement Models

The two-factor measurement model (beliefs and behaviors) for religious involvement items has previously been reported for this sample (Roth et al., 2012). Allowing for two correlated residuals – one between the first two items that load on the religious beliefs factor and reflect the concept of closeness with God, and one for two consecutive items that load on the religious behaviors factor and reflect attendance at religious services, excellent fit was

observed for this measurement model ($\chi^2 = 138.57$, $df = 24$, $RMSEA = .045$) (Roth et al., 2012).

This religious involvement measurement model was then expanded by adding items and factors for the perceived religious influence on health behavior and illness as punishment models. The seven perceived religious influence on health behavior items formed one factor and the eight illness as punishment items formed another. Together with the two-factor religious involvement model (beliefs and behaviors), this overall measurement model provided a good fit to the data ($\chi^2 = 2116.03$, $df = 324$, $\chi^2/df = 6.53$, $RMSEA = .05$, comparative fit index [CFI] = .94, Tucker Lewis Index [TLI] = .99). All items had reasonable and significant loadings on the appropriate factors. No additional modifications were considered.

Structural Models

Table 2 reports the relationships between the two religious involvement factors and 1) the mediating latent variables of perceived religious influence on health behavior and illness as punishment, and 2) the six health behavior outcome variables. Standardized estimates are reported both before and after accounting for the demographic covariates (age, gender, education, self-rated health) and the other religious involvement factor. This analysis suggests that, when controlling for both covariates and the religious behaviors, religious beliefs were positively associated with religious influence on health behaviors and negatively associated with illness as punishment. The controlled analysis also shows a negative association with fruit consumption and positive association with smoking, presumably due to a suppressor effect (described below). In analyses that controlled for both covariates and religious beliefs, religious behaviors were positively associated with both mediator variables, as well as fruit and vegetable consumption. Religious beliefs were negatively associated with all three alcohol use outcomes and smoking. Uncontrolled analyses as well as those controlled only for demographic covariates are also presented.

Table 3 reports the standardized estimates for the structural models that were conducted to evaluate the mediation hypotheses. The standardized path estimates in Table 3 for the a, b, and c paths correspond to those illustrated in Figure 2 for each mediator and each health behavior analyzed separately. Table 3 also provides the RMSEA from each model when including the outcome variable and the four exogenous covariates. Because the a_1 and a_2 paths represent the relationship with religious beliefs and religious behaviors, respectively, with the mediator, these estimates are consistent and change very little from one health behavior outcome to another within a certain mediator variable.¹

Perceived religious influence on health behavior—The “a” paths for the models examining perceived religious influence on health behavior as a mediator indicated that both religious beliefs and religious behaviors were positively associated with higher levels of perceived religious influence ($ps < .001$; see Table 3).

¹Additional analyses were also conducted for a measure of physical activity as an outcome variable, but preliminary analyses indicated that physical activity was not significantly associated with either religious involvement or the mediating variables, precluding any significant mediation effects.

Examining the “c” direct paths in these models, religious beliefs were negatively associated with fruit consumption ($p < .001$), positively associated with greater likelihood of reporting alcohol use in the past 30 days ($p < .01$), and associated with an increased likelihood of reporting smoking behavior ($p < .001$; see Table 3). These direct effects are all in the opposite direction of what would be anticipated and are generally in the opposite direction of the unadjusted associations reported in Table 2. Consequently, these direct effects are indicative of a suppressor effect (MacKinnon, Fairchild, & Fritz, 2007; MacKinnon, Krull, & Lockwood, 2000) due to the high correlations among religious beliefs, religious behaviors, and perceived religious influence. Conversely, religious behaviors were associated with greater fruit ($p < .001$) and vegetable consumption ($p < .01$), lower likelihood of alcohol use in the past 30 days ($p < .001$), lower likelihood of days with 4 or 5 drinks consumed ($p < .01$) and fewer number of drinks on any drinking day ($p < .05$). The relationship with smoking was non-significant. Similar results related to the “c” paths but involving different mediators have been previously reported for this sample (Holt, Roth, et al., 2012).

Evaluating the “b” paths, or the relationships between the mediator and the health behavior outcome, perceived religious influence on health behavior was positively associated with fruit consumption ($p < .001$), negatively associated with alcohol use in the past 30 days ($p < .001$), and negatively associated with smoking status ($p < .001$; see Table 3). Paths for the other health behaviors (e.g., vegetable consumption, days of 4/5 drinks; largest number of drinks) were non-significant.

The mediation analysis indicated evidence of mediation in the relationship between religious beliefs and the outcomes of fruit consumption, alcohol use in the past 30 days, and smoking status (see Table 3, “Indirect” column). There was also evidence for mediation in the relationship between religious behaviors and these same three health behaviors. No evidence was provided for mediation in the other health behaviors.

Illness as punishment for sin—Examining the “a” paths, level of religious beliefs were associated with lower levels of perceived illness as punishment for sin ($p < .01$; see Table 3). Religious behaviors were positively associated with greater perceived illness as punishment for sin ($p < .001$). However, when examining Table 2 where these relationships are examined in an unadjusted fashion, neither have significant relationships with illness as punishment.

Examining the “c” direct paths, level of religious beliefs were negatively associated with fruit consumption ($p < .01$; see Table 3). This is in the opposite direction of what would be anticipated, and suggestive of the aforementioned suppressor effect (Fritz, 2007; MacKinnon et al., 2007; MacKinnon et al., 2000). Conversely, religious behaviors were associated with greater fruit ($p < .001$) and vegetable consumption ($p < .01$), lower likelihood of alcohol use in the past 30 days ($p < .001$), lower likelihood of days with 4 or 5 drinks consumed ($p < .01$), fewer number of drinks on any drinking day ($p < .05$), and lower likelihood of being a smoker ($p < .01$).

Evaluating the “b” paths, or the relationships between the mediator and the health behavior outcome, illness as punishment was negatively associated with vegetable consumption ($p < .$

01), positively associated with likelihood of days with 4 or 5 drinks consumed ($p < .05$), and associated with more drinks on any drinking day ($p < .05$; see Table 3). Paths for the other health behaviors (e.g., fruit consumption, alcohol use in the past 30 days; smoking status) were non-significant.

The mediation analysis indicated evidence for mediation for the relationship between religious beliefs and vegetable consumption and largest number of drinks on any drinking day (see Table 3, “Indirect” column). There was evidence for mediation between religious behaviors and vegetable consumption, likelihood of days with 4 or 5 drinks consumed, and largest number of drinks on any drinking day. No evidence of mediation was suggested for the other health behavior outcomes.

Discussion

The present study examined the role of perceived religious influence on health behavior, and perceptions of illness as punishment for sin, as mediators of the relationship between religious involvement and health behaviors among healthy African American adults. Though previous theoretical models have suggested that perceived religious influence on health behavior (e.g., healthy lifestyle as a result of one’s religious beliefs) is a main reason why individuals who are religiously involved experience positive health outcomes, there has been surprisingly little research aimed specifically at testing this hypothesis. More broadly, religious involvement might have both positive and negative influences on one’s health. The notion that some people believe illness can occur as a punishment for one’s wrongdoings or sin has been previously reported in the literature (Abramowitz et al., 2002; Crawford et al., 1992; Ellison, 1994; Ellison & Levin, 1998; Kaldjian et al., 1998; Klonoff & Landrine, 1994; Kopelman, 2002; Neylan et al., 1998), but as of yet has gone untested as a religion-health mechanism. The present study addresses the complex relationships between religious involvement, perceived religious influence on health behavior, perceptions of illness as punishment for sin, and health behaviors.

Religious Involvement and the Mediators

Those high in religious beliefs and behaviors tended to report high belief in performing health behaviors in accord with religious doctrine. This would be an anticipated relationship with religious beliefs and participation; however the relationships with perceptions of illness as punishment for sin were somewhat puzzling. Religious beliefs and behaviors were individually not associated with illness as punishment, but when controlling for each other, religious beliefs were positively associated and religious behaviors were negatively associated with belief in illness as punishment for sin. This analysis was based on the variance in religious beliefs and behaviors that was not shared between the two aspects of religious involvement. Given the high positive correlation between religious beliefs and behaviors, the remaining smaller amounts of independent variance for these constructs are associated with belief in illness as punishment in opposing and counterbalanced directions. Therefore, the seemingly counterintuitive finding of a positive association between religious behaviors and illness as punishment is only observed after statistically controlling for religious beliefs.

Religious Involvement and Health Behaviors

We found that religious behaviors were associated with protective health measures such as fruit and vegetable consumption. As previously reported (Holt, Roth, et al., 2012), religious beliefs, when accounting for the suppressor effect, were associated with greater fruit consumption and lower alcohol use. These findings would be expected given the literature on the salutary relationship between religious involvement and health (Koenig et al., 2012). In a recent review, it was suggested that “all major religious traditions have rules and regulations concerning diet, sexual practices, and other health-related behaviors, although they vary in the extent to which such guidelines are enforced.” (Koenig et al., 2012, p. 535). This review indicated that 62% of the studies examined reported a positive association between religiosity and diet quality. Previous research has suggested that religious involvement is associated with higher fruit and vegetable consumption specifically (Holt, Haire-Joshu, Lukwago, Lewellyn, & Kreuter, 2005).

Religious behaviors were also associated and lower alcohol use and smoking. Religious sanctions that come from involvement in a religious community may protect against alcohol consumption (Musick, Blazer, & Hays, 2000; Strawbridge et al., 2001). In the current sample, 58% of people reported that they had not consumed an alcoholic beverage in the previous 30 days. This is consistent with previous research that suggests African Americans consume alcohol at rates lower than national averages (Substance Abuse and Mental Health Services Administration, 2010).

Mediators and Health Behaviors

Those who believed in maintaining a healthy lifestyle in accord with religious doctrine tended to have higher fruit consumption and lower rates of alcohol use and smoking. Again, these behavioral patterns would clearly be expected based on theory in this area (Ellison & Levin, 1998; George et al., 2002; George et al., 2000; Levin & Vanderpool, 1989; Mullen, 1990; Musick, Traphagan, et al., 2000; Strawbridge et al., 2001). Similarly, those who believed that a higher power might use illness as a punishment for wrongdoings or sin had lower vegetable consumption and were more likely to engage in binge drinking behaviors. This too is consistent with expectations from the aforementioned previous literature on this construct.

Mediational Findings

The analyses supported the occurrence of mediation in several cases. It appears that the relationship between religious beliefs and fruit consumption, alcohol use in the past 30 days, and smoking was, at least in part accounted for by perceived religious influence on health behavior. The same was true for religious behaviors. As proposed by previous researchers (Ellison & Levin, 1998; George et al., 2002; George et al., 2000; Levin & Vanderpool, 1989; Mullen, 1990; Musick, Traphagan, et al., 2000; Strawbridge et al., 2001), individuals who are religiously involved may tend to live a healthier lifestyle in accord with their religious traditions. It is interesting that the same mediational patterns were evidenced for both religious beliefs and behaviors. While this may initially seem reasonable, with religious involvement being a multidimensional construct, it is not unusual for religious beliefs and behaviors to operate differently with regard to relationships with health behaviors. This

suggests that both religious beliefs such as having a close personal relationship with a higher power, and behaviors/participation through organized worship both work to reinforce healthy lifestyle habits. It is also interesting in the current findings that this appears to apply to both health risk (heavy alcohol use, smoking) and protective (dietary) behaviors. Future studies should conduct such analyses on health-related outcomes such as illness and/or mortality.

The mediational analyses suggest that the relationship between religious beliefs and vegetable consumption and binge drinking is, at least in part, accounted for by the perception that illness is the result of punishment for sin. This suggests that individuals with strong religious beliefs are less likely to believe that illness is punishment for sin, and this translates to increased vegetable consumption and decreased binge drinking. The analyses also suggest that the same mediational findings for the relationship between religious behaviors and vegetable consumption and binge drinking. However, in these models, the signs are in the opposite directions. This suggests that individuals who are religiously involved are *more* likely to believe that illness is punishment for sin, and this translates to decreased vegetable consumption and more binge drinking.

The findings in Table 2 are needed to interpret this seemingly inconsistent effect. Note that the bivariate unadjusted relationship between religious beliefs and behaviors and illness as punishment are non-significant. Then, when controlling for the other religious involvement subscale, these relationships become significant and in the opposite direction, such that religious beliefs becomes negatively associated and behaviors becomes positively associated. This is suggestive of the aforementioned suppressor effect, which persists in Table 3 (columns a_1 and a_2), where the paths involving religious beliefs and behaviors are in the opposite directions. Because the mediation paths are a function of the multiplicative effects of the $a \times b$ paths, these signs directly impact the mediation effects. Taken together, and in the context of the suppressor effect, these findings may be considered to be consistent with previous literature, in that individuals with increased belief in illness as punishment for sin would engage in less adaptive health behaviors (Ellison, 1994; Ellison & Levin, 1998). However, additional research is needed to confirm these findings.

Strengths and Limitations

Several factors strengthen the current findings. First, the focus was on African Americans, a population that carries a significant burden of chronic disease and has not been the focus of research in the way that other groups have been (Ellison et al., 2010). Second, the RHIAA dataset was intended specifically for testing theoretical models of the religion-health connection and used validated measures in doing so, rather than using secondary data. Third, the present analysis used modeling techniques that allowed for mediational relationships to be assessed.

Several limitations should also be considered. First, the use of telephone survey methods introduces a certain bias. The full nature of this bias is unknowable. Response bias presents a data problem if there is an impact on data quality that is not random (Langer, 2003). The current response rates are comparable to a national telephone survey that over-sampled African Americans (Hartmann, Gerteis, & Edgell, 2003), and are consistent with recently

reported decreases in response rates for typical telephone surveys, from 36% in 1997, to 25% in 2003, to 9% in (Pew, 2012). Relative to the U.S. Black population, the current sample is older than the US median age of 32.7 years (current median = 54.0); contains fewer men (current = 38.2%; US = 47.7% male); is more educated (current % attended 4+ years of college = 26%; US = 18.4%) (U.S. Census Bureau, 2011); and is as likely to report attending religious services at least once per week (current = 50.6%; US = 53%) (Pew, 2009). Given this, a potential impact on the study findings may be that the sample may hold stronger religious beliefs than average, given that they are more likely to be older and women (Levin et al., 1994). It is possible that, being relatively well educated, they may also have better health behaviors than average. Taken together, the study may over-estimate the religion-health connection in an average African American. However, one must always be careful when working with averages and making generalizations to a very heterogeneous population group.

Second, the current analyses focused on two mediators from the literature, perceived religious influence on health behavior and illness as punishment. As previously discussed, although perceived religious influence on health behavior is probably the most widely cited potential mechanism of the religion-health connection, there are other significant factors that may help account for this complex relationship including but not limited to social support and positive affective states. Though these are potentially important, structural models become difficult to interpret as additional constructs are added. The RHIAA approach was to aim for a more clear understanding of fewer mediators at a time, rather than a larger but incomprehensible model. Third, because the current data were cross sectional, conclusions about causality are not possible. Longitudinal data would be required to make such assertions, an initiative on which the RHIAA team is currently embarking.

Implications and Future Research

These findings indicate that people who are religiously involved may experience better health outcomes because they engage in healthy lifestyles in accord with their religious beliefs, and that belief that illness is the result of punishment from a higher power could play a potentially maladaptive role in health behaviors. With regard to implications for the illness as punishment findings, this is where church-based counseling or pastoral counseling may play a role in working with individuals who may hold such beliefs, with a spiritual sensitivity and competence (Pargament, Mahoney, & Shafranske, 2013).

By focusing on African Americans, a population adversely impacted by most chronic disease, the study is framed in the context of health disparities, thereby enhancing the public health significance of the findings. Healthy People 2020, along with setting specific health-related goals for the US population, aims to attain health equity and eliminate health disparities group (U.S. Department of Health and Human Services, 2010). Because so much of chronic disease has behavioral origins (Ford et al., 2011), it is important to learn more about how salient cultural beliefs that associated with health behavioral outcomes.

There has been a steady focus on faith-based organizations as venues for health promotion activities (Levin, 2013), particularly in African American communities (Levin, 1984). African American churches serve as a cornerstone of the communities they serve, and are

places where their members have been able to receive guidance and services on matters far beyond spiritual (Lincoln & Mamiya, 1990). The church is a venue where people who may not otherwise be connected with the health care system can receive health information from trusted sources. By learning more about *how* religious involvement is associated with health behaviors, this information can be used to inform such interventions. This information can not only be helpful to researchers but also to faith-based leaders who are involved in health ministry activities, or things that faith-based organizations do in order to improve the health of their memberships. Finally, Levin (2013) described an agenda for the Surgeon General, that highlighted the role of faith communities in health promotion, consistent with an upstream approach to public health. The current findings reinforce the need to continue to engage with faith-based organizations that serve African Americans, in the effort to eliminate health disparities.

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Appendix A: Items comprising mediator scales

Perceived religious influence on health behavior
I tend to avoid things harmful to my body because of my religious/spiritual beliefs.
Religious/spiritual beliefs have great influence on my health.
God helps me to maintain a healthy lifestyle.
God helps me to avoid bad health habits.
Because of my religious/spiritual beliefs, I do not put harmful substances into my body.
I try to engage in “clean living” because this is what my religion/spirituality teaches.
Because of my religious/spiritual beliefs, I abstain from tobacco/smoking.
Illness as Punishment for Sin
Illness is the result of one’s negative thoughts.
God uses sickness to send a message to people.
Illness comes because of something bad a person has done in their life.
God sometimes uses physical illnesses to punish people.
God uses sickness as punishment for the things people have done wrong in their lives.
Illness is a punishment/result from God for sinful behaviors or lifestyle.
Illness is caused by a sinful lifestyle.
God uses sickness as a way to punish people for their sins.

Adapted from: Holt, Clark, Roth, Crowther, Cohler, Fouad, ... Southward, 2009.

Figure 1.
 Religion-Health Mediation Model
 Note: Constructs in bold were included in the current analysis.

Figure 2.

Structural model

Note: The two mediators were tested in separate structural models.

Table 1

Participant demographic characteristics

Characteristic	Categories	N=2,370
Age, mean (SD)		53.63 (14.82)
Relationship status	Never married	13.3%
	Single	17.2%
	Married or living w/partner	36.9%
	Separated or Divorced	18.8%
	Widowed	13.8%
Education	Grades 1–8	2.7%
	Grades 9–11	9.4%
	Grade 12 or GED *	32.8%
	1–3 yrs college	29.3%
	4+ yrs college	25.7%
Work status	Full-time	38.3%
	Part-time	11.8%
	Not currently	12.6%
	Retired	26.2%
	Receiving disability	11.2%
Income	< \$5,000	8.7%
	\$5,000–\$10,000	12.4%
	\$10,000–\$20,000	14.8%
	\$20,000–\$30,000	13.4%
	\$30,000–\$40,000	11.6%
	\$40,000–\$50,000	9.3%
	\$50,000–\$60,000	8.3%
	>\$60,000	21.4%

Note. Numbers may not sum to 2,370 or 100% due to missing data.

* GED = General Equivalency Diploma

Table 2

Standardized estimates of the unadjusted and adjusted effects of religious involvement on the mediators and health outcomes (N = 2358)

Mediator/Outcome	Religious Beliefs			Religious Behaviors		
	Unadjusted	CV Adjusted	CV-Rel Adjusted	Unadjusted	CV Adjusted	CV-Rel Adjusted
Religious Influence (latent factor)	.555***	.519***	.284***	.550***	.554***	.354***
Illness as Punishment (latent factor)	-.032	-.019	-.121**	.047	.068**	.153***
Fruit Servings	.055*	.037	-.117**	.189***	.149***	.232***
Vegetable Servings	.041	.022	-.061	.126***	.082**	.125**
Alcohol use (yes/no)	-.098***	-.067**	.063	-.223***	-.152***	-.196***
Days 4/5 alcohol drinks	-.047	-.038	.077	-.126**	-.120**	-.174**
Largest number of drinks	-.104**	-.064	.019	-.179***	-.112**	-.126*
Smoking status	-.019	.001	.073*	-.098***	-.057*	-.108**

*

p < .05

**

p < .01

p < .001

Note. CV = Covariate. Rel = Religious Involvement. The CV adjusted effects are adjusted for age, gender, education, and self-rated health. The CV-Rel adjusted effects are those adjusted for age, gender, education, self-rated health, and the other religious involvement latent factor.

Table 3

Standardized estimates from the structural equation models testing mediation effects (N = 2358).

Mediator	Health Behavior	b	Religious Beliefs				Religious Behaviors			
			a ₁	Direct (c ₁)	Indirect	a ₂	Direct (c ₂)	Indirect	RMSEA	
Religious Influence	Fruit servings	.107***	.290***	-.147***	.031**	.350***	.193***	.038***	.054	
	Vegetable servings	.024	.290***	-.067	.007	.349***	.115**	.008	.055	
	Alcohol Use (Y/N)	-.142***	.288***	.103**	-.041***	.351***	-.145***	-.050***	.057	
	Days 4/5 alcohol drinks	.046	.290***	.064	.013	.349***	-.187***	.016	.055	
	Largest number of drinks	.002	.290***	.019	.000	.349***	-.125*	.001	.055	
	Smoking Status	-.254***	.287***	.144***	-.073***	.351***	-.017	-.089***	.067	
Illness as Punishment	Fruit Servings	-.032	-.119**	-.119**	.004	.150***	.232***	-.005	.045	
	Vegetable Servings	-.060**	-.118**	-.066	.007*	.149***	.129**	-.009*	.045	
	Alcohol Use (Y/N)	-.036	-.119**	.055	.004	.151***	-.185***	-.005	.046	
	Days 4/5 alcohol drinks	.088*	-.118**	.083	-.010	.149***	-.179***	.013*	.045	
	Largest number of drinks	.086*	-.118**	.027	-.010*	.149***	-.132*	.013*	.045	
	Smoking Status	.028	-.119**	.071	-.003	.150***	-.105***	.004	.046	

Note: RMSEA = root mean square error of approximation.

The a₁, a₂, b, c₁, and c₂ entries are the standardized estimates that correspond to the paths illustrated in Figure 2.