RELIGION, SOCIODEMOGRAPHIC AND PERSONAL CHARACTERISTICS, AND SELF-REPORTED HEALTH IN WHITES, BLACKS, AND HISPANICS LIVING IN LOW-SOCIOECONOMIC STATUS NEIGHBORHOODS

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Objective: This study examines the multifaceted role of race/ethnicity in the relationship between religiosity and health.

Methods: Analysis of variance (ANOVA) and pairwise comparisons were used to compare the means for health, religiosity, and personal characteristics in Blacks, Whites, and Hispanics. A simultaneous-equation model with five equations modeled the relationship between physical health, mental health, self-rated health, organizational religiosity, and non-organizational religiosity. Qualitative data were used to help interpret quantitative results.

Results: Health outcomes, religiosity, reasons cited for being a member of a religious organization, and personal factors differed by race/ethnicity. Overall, individuals with more social resources tend to have higher organizational religiosity and better health, while individuals with fewer social resources tend to have higher non-organizational religiosity and poorer health. The model indicates the complexity of the relationships between race/ethnicity, religiosity, and health. Blacks reported higher organizational and non-organizational religiosity than Whites, while Hispanics reported higher non-organizational religiosity, after controlling for sociodemographic and personal factors and reasons cited for belonging to a religious organization. Being Black was directly associated with lower mental health and self-rated health; however, being Black was indirectly positively associated with mental health through organized religiosity and indirectly negatively associated with physical and mental health through non-organizational religiosity. Being Hispanic was directly associated with worse self-rated health but was indirectly positively associated with mental health through organizational religiosity.

Conclusion: The role of race/ethnicity in the relationship between religiosity and health is complex, but the findings presented in this paper offer insights into the nature of these associations. (*Ethn Dis.* 2005;15:469–484)

Key Words: Health Outcomes, Race/Ethnicity, Religion, Simultaneous-Equation Model

INTRODUCTION

Definitions and Measures of Religiosity

Religiosity is a multifaceted construct of great complexity, and measures of religiosity must meaningfully account for the different ways of being religious and of practicing religion.[1] Those who actively attend services and other activities of a religious body are said to practice organizational religiosity, also denoted as social religion or institutional religion.[2–4] Most studies have measured organizational religiosity by self-reported frequency of attendance at worship services or other church-based activities. However, interviewer-administered survey questions that directly ask about religious attendance lead to over-reporting of attendance.[5]

More informal and private forms of involvement, for example individual prayer, Bible study, feelings of closeness to God, and importance of religious beliefs, represent non-organizational religiosity. Non-organizational religiosity includes intrinsic religious orientation, ideologic religion (ideology and belief salience), and personal devotion (devotional intensity and prayer).[2,4] Non-organizational religiosity is often determined by responses to questions inquiring about the frequency of prayer, the importance placed on religion in daily life, and the extent to which religious beliefs serve as a source of life's meaning.[3]

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Relationships Between Religion and Health

While studies relating religious affiliation to health date back at least one hundred years,[6–8] interest has been renewed in the connection between religiosity and health. In recent years, scholars from disciplines as diverse as sociology, psychology, and epidemiology have investigated the complex relationship between various dimensions of religiosity and mortality, self-rated health, psychological well-being, mental health, as well as specific diseases.[9] Most studies show that high levels of religious involvement have a positive moderate association with better health outcomes.[10–13] Other studies find no association or a negative one.[14–18]

Pathways from Religion to Health

Religion provides many benefits to religious individuals, and some of those benefits positively affect health.[19,20] Religious participation and beliefs foster healthy behaviors, provide material and social resources, promote positive self-perceptions and emotions, and provide coping resources.[19] These benefits of

Most studies show that high levels of religious involvement have a positive moderate association with better health outcomes.[10–13]

religion have been postulated as the mechanisms or pathways through which religiosity may affect health.[9] Figure 1 describes possible pathways from organizational and non-organizational religiosity to health.

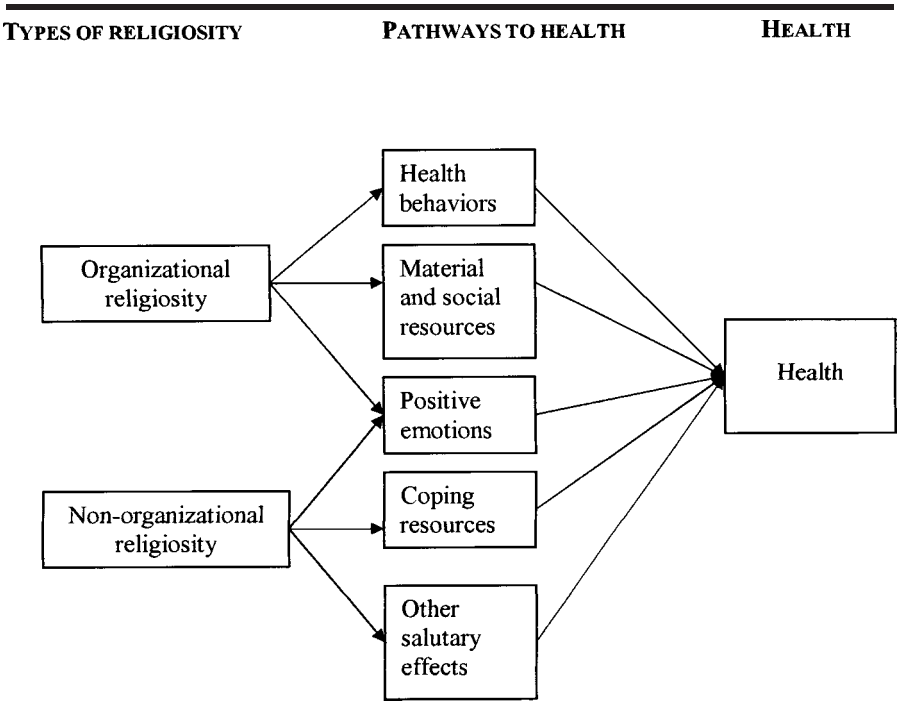


Fig 1. Pathways to health

Pathways from Organizational Religion to Health

Health Behaviors. Religious groups, especially the more conservative ones, tend to discourage behaviors that are harmful to health, such as alcohol, tobacco, substance abuse, and risky sexual behaviors.[21]

Material and Social Resources. Often, religious communities provide material resources to their members that are beneficial for health. Providing instrumental aid, such as economic and material assistance as well as information and access to networks (for example health or job networks), is an important aspect of religious organizations.[22,23] Religious communities also provide social resources to their members. A large body of literature confirms the strong beneficial effects of social support and social integration on health, and the positive association between religious attendance and health has often been explained by the role of religious communities in providing this support through a sense of belonging and social ties with like-minded individuals.[12] Church members are likely to have larger and denser social networks,[24] and frequent church attendance tends to lead to more spiritual and emotional support from fellow parishioners, with a positive effect on health.[25]

Pathways from Non-Organizational Religion to Health

Positive Emotions. Positive emotion is a pathway from both organizational and non-organizational religion to health. Religious involvement and devotion can enhance feelings of self-esteem, moral self-worth, and personal efficacy, which are known to benefit health.[16] Many religious doctrines emphasize positive emotions, such as love, forgiveness, and contentment, which are beneficial to health by operating through complex psychological and physiological systems.[9] Furthermore, religious worship has been linked to positive emotions.[20] Worshiping publicly with others fosters feelings of trust and intimacy by activating an attachment process that connects people to one another and to God as well as induces feelings of love and forgiveness.[20,26] Private worship is also conducive to similar emotions.[20]

Coping Resources. Religiosity has been identified as a coping mechanism for those facing adversity because it allows individuals to make sense of their suffering and to accept it.[9,19,27,28] Religious beliefs and prayer are often invoked as coping mechanisms by those confronting crises.[18,29,30] Faced with poor health, many individuals look to religion for comfort.[19,28] Religious coping is particularly prevalent in disenfranchised groups, such as elders, women, minorities, and the poor.[31] Lower-income individuals are more likely to emphasize religious coping when faced with personal problems.[32] Several studies have identified non-organizational religiosity as a popular coping resource in African-American and Hispanic women with HIV/AIDS,[33] in battered women,[34] in people who are experiencing serious health threats,[35] in elderly individuals living in poor neighborhoods,[36] and in disabled clients of a rehabilitation clinic.[18] When religion develops as a coping resource, the causal relationship is reversed: because people who are sicker pray more, not because praying causes sickness, a negative association may exist between non-organizational religiosity and health.[18,37]

The Role of Race in Religiosity

Religious involvement and expression vary between different ethnic/racial groups. In this section we discuss how members of minority populations tend to be more religiously involved than non-Hispanic Whites (denoted by Whites in this paper).[10,38]

Organizational Religion in African Americans

Blacks have higher religious attendance than Whites, and Black individuals have been shown to reap the health benefits of religion, sometimes more so than Whites.[10,25,38]

Material and Social Resources. In minority groups, religiosity tends to be rooted in relationships and community.[35] Black churches often provide economic and material assistance, for example transportation, money, food, and clothing.[22,23,39] Many minority congregations provide information on health education, how to access health care, and how to arrange financial assistance.[40–42] African-American congregations are attentive to the overall well-being of their members and actively participate in supporting their communities by focusing outreach ministries toward community development, civil rights and social justice, non-religious education, job-related activities, and substance-abuse prevention.[39,43–45]

Non-Organizational Religion in African Americans

Blacks pray more often and have stronger salience of religious beliefs than Whites.[38]

Positive Emotions. Religiosity in African Americans often manifests itself with greater emotional intensity and personal involvement in worship services than in services in non-minority churches.[46] These differences may be related to "the experience of religion among slaves, who used their worship services to create tightly-knit communities and to provide the emotional support necessary to endure the hardship of slavery."[4] Today's African Americans may look to religion for those same strengths now needed to face modern day discrimination and frequent poverty.

Coping Resources. In addition to experiencing positive associations between religion and health, Blacks are also more likely to use religion as a coping mechanism in times of crisis and physical suffering.[37] Studies show that when confronting health problems, Blacks are more likely to turn to religion than Whites.[37] Studies have identified non-organizational religiosity as a coping resource for African-American mothers of seriously ill infants,[47] for African Americans confronting personal problems,[31,48] for elderly African Americans,[49] and for African-American women.[50,51]

Non-Organizational Religion in Hispanics

Other Salutary Effects. Hispanic religiosity is culturally embedded and is often viewed as empowering, for example in the devotion to the Virgin Mary for Latina.[52] Strong salutary effects of religiosity have been documented in Hispanics.[53] Studies on Hispanic women indicate an emphasis on the role of spirituality and the integration of the spiritual dimensions as part of a healthy lifestyle.[54] Findings suggest that religious practices and spirituality may have positive benefits for Hispanic women when these elements are integrated into health care or stress reducing therapies.[54]

Coping Resources. Religion is an important coping resource for Hispanic women, who report turning to prayer and a spiritual life in the face of adversity.[54]

Individual Characteristics and Religion

Differences in religious involvement and expression in the different racial/ethnic groups may be based in differences in the social and economic environments in which minority populations live. Blacks and Hispanics are more likely to be at a socioeconomic disadvantage compared to Whites and to have concerns in their lives that differ from those predominant in the White population. Racism is one such example. In this section, we discuss the relationships between religiosity and individual characteristics, including sociodemographic and personal factors and motivations for belonging to a religious organization.

Sociodemographic Characteristics and Religion

Demographic and socioeconomic characteristics influence religiosity. Socioeconomic status (SES), region of residence, and denominational affiliation affect religious involvement.[32,38] Females, older individuals, those with more education, and southerners are likely to attend religious services more frequently.[10,32] Gender and age are also associated with non-organizational religiosity.[32]

Personal Characteristics and Religion

Other personal characteristics, some positive (such as social support, social trust, and perceived personal opportunity) and some negative (such as fear of victimization and perceived racism), are known to influence religious involvement. The evidence is strong that social support and religious activity are positively associated.[55,56] A positive outlook and a sense of optimism about the future, measured in this paper by perceived personal opportunity and social trust, has also been positively associated with religion.[20,57] A large literature discusses religion as a coping resource.[19] Individuals turn to religious coping when faced with life crises and difficulties.[19] Therefore, individuals subjected to fear of victimization and perceiving racism are more likely to use religious coping, which results in a positive association between these stressors and non-organizational religion.[58,59]

Motivations for Belonging to a Religious Organization

The reasons why individuals join religious organizations are varied. As dis-

cussed earlier, several of the benefits of religiosity, for example access to material and social resources and positive emotions, potentially benefit health. Those same benefits of religion draw individuals to participate in religious organizations. Individuals' decisions to join a religious organization may be motivated by a desire to participate in worship and perform positive acts, to gain access to the material and social resources provided by religious organizations, or because participation in a religious group is a cultural characteristic of their racial/ethnic group. In this study, we investigated some of the benefits associated with religion that motivate individuals to belong to a religious organization. Following the typology used in the literature on pathways from religiosity to health, these are categorized as: 1) motivations related to material and social resources, for example, obtaining material resources in the form of food or clothes, obtaining access to job or political networks, and increasing social support and networks; 2) motivations related to positive emotions, for example, participation in worship and volunteering opportunities; and 3) motivations related to cultural aspects of the racial/ethnic group.

THE MODEL

In this paper, we develop a model to investigate whether sociodemographics, personal characteristics, and motivations for belonging to a religious organization explain racial differences in religiosity (main hypothesis 1) and whether differences in religiosity explain racial differences in health, controlling for age, gender, and education (main hypothesis 2), in samples of Black, Hispanic, and White individuals living in low-SES neighborhoods in Texas.

In the model, sociodemographic characteristics, personal characteristics, and motivations for belonging to a religious organization are hypothesized to influence organizational and non-organizational religiosity. Organizational and non-organizational religiosity are hypothesized, in turn, to have an impact on health outcomes, controlling for sociodemographic characteristics. The model is depicted in Figure 2.

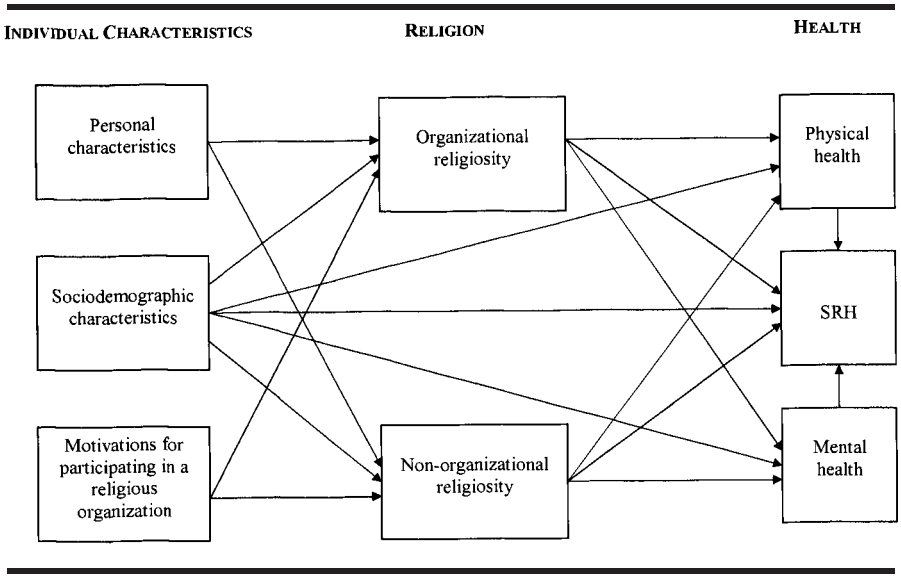


Fig 2. Simultaneous-equation model

Differences by Race/Ethnicity in Health, Religion, and Individual Characteristics

This section discusses how all the variables presented in Figure 2 are likely to vary by race/ethnicity.

Health

Much literature documents racial/ethnic differences in health outcomes.[60] Age-adjusted mortality rates for Blacks are higher than those for any other group, while for Hispanics they tend to be lower than for Whites.[61,62] While morbidity and mortality rates tend to be higher in African Americans compared to Whites in many physical indicators, mental health indicators show an inconsistent pattern.[63] African Americans have been reported to have relatively low rates of mental disorders, despite stress from discrimination.[64] Other researchers report higher rates of depression among Blacks.[65]

In this paper, we consider self-reported physical health, mental health, and self-rated health obtained from the SF-12. The literature is more sparse on racial/ethnic differences in self-reported health status. Overall, Hispanics tend to report better physical health than expected given their socioeconomic status but uniformly lower self-rated health. The evidence on self-reported mental health in Hispanics is mixed.[66] African Americans tend to report lower self-rated health compared to Whites.[67]

Religion

Based on the above literature that suggests that religious involvement varies by race/ethnicity, we investigated differences in organizational and non-organizational religiosity between Blacks, Hispanics, and Whites in our sample. Following other researchers,[38] we expected Blacks and Hispanics to be more involved than Whites in both organizational religiosity (measured by attendance at religious services and other activities at a place of worship) and non-organizational religiosity (measured by frequency of prayer, the salience of religious beliefs to everyday life, and as a source of meaning in one's life).

Individual Characteristics

Though our sample consists of individuals living in low-income neigh-

borhoods, we expected Blacks and especially Hispanics to have less education than Whites. Because of discrimination and socioeconomic disadvantages in minorities, we expected racial/ethnic differences in positive personal characteristics (social support, social trust, and perceived personal opportunity) and negative personal characteristics (fear of victimization and perceived racism), with Blacks and Hispanics having less positive and more negative factors than Whites.[68] We analyzed racial/ethnic differences in the reasons cited for being a member of a religious organization. We hypothesized that all racial/ethnic groups will rate worship as an important motivation for religious participation. We also hypothesized, on the basis of studies reporting greater community involvement and more material assistance on the part of minority churches, that Blacks and Hispanics are more likely to indicate material help, social support, and political influence as reasons for participating in religious organizations. Recognizing the important role of religion in Hispanic culture as discussed earlier, we expected a larger proportion of Hispanics, as compared to Blacks and Whites, to cite their heritage as a reason for belonging to a religious organization.

Individual Characteristics and Religion

We hypothesized that differences in religiosity by race/ethnicity may be associated with sociodemographic and personal factors that may differ by race/ethnicity. As did other researchers,[10,32,38] we expected sociodemographic characteristics such as age, gender, and education to affect religiosity. Furthermore, positive personal characteristics such as social support, social trust, and personal opportunity were hypothesized to be positively associated with organizational religion, reflecting the beneficial aspects of organizational religion. Negative personal characteristics, such as fear of victimization and perceived racism, were hypothesized to be positively associated with non-organizational religion, reflecting religious coping. We had no a priori hypothesis of how the different motivations for being a member of a religious organization would be associated with organizational and non-organizational religiosity. The relationships discussed above are represented in Figure 2 by the arrows from Individual Characteristics to Religion.

Race/Ethnicity, Religion, and Health

Religion and Health

The varying evidence on the relationship between religiosity and health has been explained by the different conceptualizations of religiosity and definitions of health.[4] In this paper we investigated the relationships of organizational religiosity and non-organizational religiosity to self-reported physical health, self-reported mental health, and general self-rated health. These relationships are represented in Figure 2 by the arrows from Religion to Health.

Given the multifaceted dimensions of religiosity, we expect that different dimensions of religiosity will have different associations with health, depending on the religiosity dimension and the health measure chosen. We hypothesized that race/ethnicity and other sociodemographic characteristics, such as age, gender, and educational level, affect both religiosity and health outcomes. To capture the simultaneous determination of religiosity and health outcomes, we used a simultaneous-equation model with five equations: two equations model religiosity (organizational and non-organizational) as a function of sociodemographic and personal characteristics and reasons cited for belonging to a religious organization, and three equations model health outcomes (physical, mental, and self-rated health) as a function of sociodemographic characteristics and organizational and non-organizational religiosity (see Figure 2).

Overall, we expected to find that people who exercise organizational religiosity will have better health. We did not have clear prediction for the association between non-organizational religion and health. On one hand, non-organizational religion could be negatively associated with health, which suggests that religion is being used as a coping mechanism. On the other hand, non-organizational religion could be positively associated with health, which reflects the salutary effects of religion.

The Role of Race

We investigated the role of race/ethnicity in the relationships between organizational and non-organizational religiosity and self-reported physical health, self-reported mental health, and general self-rated health. In order to investigate the direct and indirect (through religiosity) effect of race on health, we tested: 1) whether sociodemographic, personal characteristics, and motivations for being a member of a religious organization explain racial/ethnic differences in religiosity; and 2) whether differences in religiosity explain racial/ethnic differences in health, controlling for age, gender, and education.

METHODS

Data Collection Methods

Data for this study were drawn from surveys and focus groups conducted as part of a project exploring social context and health in Texas neighborhoods. The study was conducted in 13 low-socioeconomic status (SES) neighborhoods in Texas between June 2001 and August 2002. Eleven neighborhoods were in the Houston area, and two were in Brownsville. The Houston communities were "super-neighborhoods" as defined by the City of Houston. The boundaries of each super-neighborhood rely on major physical features (bayous, freeways, etc) to group together contiguous communities that share common physical characteristics, identity, or infrastructure. The population size of the super-neigh-

borhoods in Houston ranged from 7244 to 22,859 with a mean of 15,034. The other sampled communities had similar population sizes.

The neighborhoods had an average poverty rate of 28% and an unemployment rate of 12%. Six neighborhoods were predominantly Hispanic (between 78% and 92%), three predominantly Black (between 82% and 93%), two predominantly White (62% and 68%), one mixed White/minority (42% White), and one mixed Hispanic/Black (49% and 43%, respectively).

One to three focus groups were conducted in each of nine neighborhoods for a total of 22 focus groups. The nine neighborhoods included one predominantly Black (82% Black and 65% females), one mixed Black/Hispanic (43% Black and 49% Hispanic and 65% females), four predominantly Hispanic in Houston (78%–92% Hispanic and 69%–77% females) and two in Brownsville (83% and 92% Hispanic and 81% and 75% females), and one predominantly White (62% White and 60% females). Participants in the focus groups were neighborhood residents identified through newspapers and radio advertisements and fliers in community centers and public libraries. Each focus group had four to eight participants of the same gender and race/ethnicity.

Respondents for the survey were identified in each of the 13 neighborhoods by using a multistage probability sample of dwellings. The multistage probability sample was drawn in three stages: 1) city blocks were sampled based on population density in each neighborhood; 2) dwelling units were sampled within each block; and 3) one adult was sampled within each selected dwelling unit. The sampling protocol was based on protocols used for similar community surveys in Baltimore and used a modification of the methods described in the Project for Human Development in Chicago Neighborhoods (PHDCN) codebook to select blocks, dwellings, and respondents.[69,70] Face-to-face interviews were successfully completed with 3,203 residents, of whom 409 identified themselves as non-Hispanic White, 919 as Black, 1,857 as Hispanic, and 18 did not respond to the race/ethnicity questions.

Focus Groups

The main topic for the focus groups was life in the neighborhood. Religion in the neighborhood was a sub-topic that was not discussed systematically. All material dealing with religion was extracted and coded by using ATLAS.ti software.[71] Because the focus of the groups was not on religion, we could not systematically analyze the information. Instead, focus group material was used to illustrate and aid in the interpretation of quantitative results.

The Survey Instrument

The survey instrument included questions on health outcomes and sociodemographic and personal characteristics. Physical and mental health were measured by the Physical Component Summary (PCS) and the Mental Component Summary (MCS) of the SF-12 with ranges between 0 and 100.[72] Self-rated health was measured by the question "In general would you say your health is . . ." with answers on a five-point scale from poor to excellent.[72] We used the norm-based scores in our analysis. Sociodemographic characteristics measured respondents' age, gender, self-reported race/ethnicity, and education. Age was reported as a continuous variable and gender as a dummy variable. Race/ethnicity was determined from two questions: one asking the respondents if they were Spanish, Hispanic, or Latino, and the second asking if they were White, Black or African-American, or some other race. These two variables, ethnicity and race, were used to categorize respondents as non-Hispanic White (hereafter White), non-Hispanic Black (hereafter Black), and Hispanic. Educational attainment was measured in seven categories from elementary school to advanced degree. Religious affiliation was measured by a single question with answers: none, Catholic, Muslim, Jewish, Protestant/Christian, other affiliation (with a write-in specification), and don't know. The motivations for participation in a religious organization were obtained from the question "Why do you think it is important to be a member of religious organizations?" with seven non-exclusive answers reflecting positive emotions ("To participate in worship services" and "To do volunteer work to help others"), access to material and social resources ("To get help with food or clothes," "To get help in finding a job," "To influence politicians," and "To make friends"), and cultural factors ("Because it is part of our heritage").

Scales validated in the literature measured religiosity, social support, perceived racism, perceived victimization, perceived personal opportunity, and general social trust. Religiosity was measured by two scales to capture both the organizational and non-organizational dimensions of religiosity. The organizational religiosity scale included two items (frequency of attendance to religious services and to other activities in the place of worship) and the non-organizational scale included three items (frequency of prayer, importance of religious or spiritual beliefs to everyday life, and importance of religious or spiritual beliefs as a source of meaning in life). The five items were taken from the religiosity scale proposed by Strawbridge et al.[3] The social support scale was a widely used three-item scale known to be associated with mortality.[11] The fear of victimization scale was a 14-item scale reporting how worried one is about being the victim of property and/or personal crime.[73] The Racism and Life Experience Scale (brief version) measured perceived racism with eight items addressing personal, family, and friends' experiences of racial/ethnic prejudice and attitudes towards prejudice.[74] General social trust was measured by a question from the General Social Survey

"Do you think that most people can be trusted or you can't be too careful about dealing with people?", which has been extensively used.[75,76] The question was asked in general and about specific groups: people in the United States, in Mexico, in your neighborhoods, in your ethnic group, the police, bank personnel and store clerks, and immigration officials. A scale for general social trust was obtained by combining the eight items. Perceived personal opportunity was measured by three items asking how good the perceived chances for getting ahead were for the respondent and his/her children and if he/she had had a fair opportunity in life.[77] Scales had an acceptable internal reliability overall and within each race: 0.81 (within race 0.70 to 0.88) for non-organizational religiosity; 0.70 (within race 0.64 to 0.76) for organizational religiosity; 0.95 (within race 0.93 to 0.95) for fear of victimization; 0.90 (within race 0.89 to 0.90) for general social trust; 0.81 (within race 0.73 to 0.81) for perceived racism; 0.79 (within race 0.75 to 0.80) for social support; and 0.54 (within race 0.48 to 0.60) for perceived personal opportunity.

Statistical Analysis

One-way ANOVA was used to compare the means for health, religiosity, and sociodemographic and personal characteristics across the three racial/ethnic groups. Post hoc Bonferroni tests were used in pairwise comparisons, that is to compare Whites with Blacks, Whites with Hispanics, and Blacks with Hispanics. The association of race/ethnicity with religiosity, controlling for demographics, SES, personal and social characteristics, and reasons for belonging to a religious organization, was assessed by using multivariate regressions and the simultaneous equations model.

A simultaneous-equation model with five equations was used to model the relationship between physical health, mental health, self-rated health, organizational religiosity, and non-organizational religiosity. Simultaneous-equation models, also known as structural equations, allow the simultaneous estimation of the endogenous variables and the estimation of the direct and indirect effects of the exogenous variables.[78] In maximum likelihood estimation of simultaneous-equation models, model development is guided by theoretical considerations and not by measures of goodness-of-fit. The model is developed to be as good a representation of the theory as possible, and this representation is assessed by the parameters' estimates and their associated standard errors and overall model significance. Asymptotic theory ensures that MLE (maximum likelihood estimation) have the desired properties of consistency and efficiency. To measure the overall model significance for each equation in the simultaneous equation model, we report the *P* value of the chi-square test. Coefficients measure the direct effects of a one-unit change in the explanatory variable on the dependent variable.

In this model, physical health, mental health, self-reported health, organizational religiosity, and non-organizational religiosity were endogenous variables, while age, gender, race/ethnicity, education, fear of victimization, general social trust, perceived personal opportunity, perceived racism, and the reasons given for being a member of a religious organization were exogenous variables. Organizational religiosity and non-organizational religiosity were modeled as functions of age, gender, race/ethnicity, education, fear of victimization, general social trust, perceived personal opportunity, perceived racism, and the reasons cited for being a member of a religious organization. Physical and mental health were modeled as functions of age, gender, race/ethnicity, education, organizational religiosity, and non-organizational religiosity. Self-rated health was modeled as a function of age, gender, race/ethnicity, education, organizational religiosity, non-organizational religiosity, and physical and mental health. All scales were standardized to be between 0 and 10 in order to obtain comparable effects on health outcomes. The five equations were simultaneously estimated by a maximum likelihood estimator.[79]

Data Imputation

Less than 3% of the observations had missing data on items used to compute the scales for social support, organizational and non-organizational religiosity, and victimization. Education was missing in 1% of the sample. Rates of absent data ranged from 2% to 10% in items measuring racism, from 3% to 6% in items measuring personal opportunity, and from 3% to 13% in items measuring general social trust.

Descriptive statistics were computed by using all available observations. However, imputed data were used in estimating the simultaneous-equations model. Missing observations were replaced by the mean in the corresponding neighborhood, gender, age group, and racial/ethnic subgroup, which is equivalent to imputing the missing values by the predicted values from a regression on neighborhood, gender, age group, and race/ethnicity. The simultaneous-equation model was also estimated without imputed values, and the results were similar.

RESULTS

Only 4% of the sample reported no religious affiliation, and 1% didn't know their affiliation or did not answer the question. Whites reported being Protestant (65%), other affiliation (15%), or Catholic (11%), and 7% reported no affiliation. Among Blacks, 37% were Protestant, 53% other affiliation, 8% Catholic, and only 2% reported no affiliation. The majority of Hispanics were Catholic (77%), followed by Protestant (13%), other affiliation (5%), and no affiliation (4%). Those responding other affiliation were classified according to

Table 1. Health outcomes in Whites, Blacks, and Hispanics

Question or Scale	Answers or Ranges	Whites	Blacks	Hispanics	*P* value
Health outcomes					
Physical health	Scale (0–100)	47.49[B,H]	45.38[W,H]	49.55[W,B]	<.001
Mental health	Scale (0–100)	51.47[B]	48.55[W,H]	50.58[B]	<.001
Self-rated health (norm-based)	Scale (18.87–61.99)	47.61[B,H]	43.20[W,H]	45.78[W,B]	<.001

W, B, and H denote respectively statistically significant difference from White, Black, and Hispanic in post-hoc Bonferroni pairwise comparisons. (For example, 47.49[B,H] in the 2nd row, 1st column means that Whites' physical health differs from both Blacks' and Hispanics' physical health.
P values are based on one-way ANOVA tests.

the types in Roof and McKinney.[80] The other affiliation group consisted mainly of Protestants (97%). Other faiths (2%), such as Mormon, Unitarian, Hindu, Celtic, and Native American, and no religious preference (1%) were also represented.

Differences by Race/Ethnicity in Health, Religion, and Individual Characteristics

Health

Table 1 reports descriptive statistics and comparisons by race/ethnicity in self-reported health outcomes. All health outcomes varied by race/ethnicity. In post-hoc Bonferroni pairwise comparisons, Blacks reported worse physical health than Whites and Hispanics, and Whites reported worse physical health than Hispanics. Blacks also reported worse mental health than Whites and Hispanics, but no differences were seen in mental health between Whites and Hispanics. Whites rated their general health the highest, followed by Hispanics and Blacks.

Religion

Table 2 reports descriptive statistics and comparisons by race/ethnicity in the religiosity scales and items forming the religiosity scales. Statistically significant differences by race/ethnicity were seen for all items and scales based on one-way ANOVA tests. All racial/ethnic groups scored high on the organizational and non-organizational religious items. In pairwise comparisons, Blacks scored higher than Whites and Hispanics on the organizational and the non-organizational scales as well as on every item included in those scales. Hispanics scored higher than Whites on the organizational scale but the same as Whites on the non-organizational scale.

Individual Characteristics

Table 3 reports descriptive statistics and comparisons by race/ethnicity in the sociodemographic variables, personal characteristics, and the reasons given for being a member of a religious organization. Whites were the most educated group, followed by Blacks. Hispanics had considerably less education. Racial/ethnic groups differed in personal characteristics, both overall and in pairwise comparisons. Blacks and Whites reported more social support than Hispanics. Hispanics had the greatest fear of crime, followed by Blacks. Whites were the most trusting and perceived the most personal opportunity and the least racism. Compared to Blacks, Hispanics were more trusting and perceived more personal opportunity and less racism.

Blacks, Hispanics, and Whites differed in what they cited as motivations for being a member of a religious organization. Attendance to worship services was given as the main reason for involvement in religious organizations in each racial/ethnic group, but less so in Hispanics than in Whites and Blacks. Blacks were the most likely to report getting help with food and clothes as the reason for being a member of a religious organization, followed by Hispanics, and Whites were the least likely. Almost two thirds of Whites cited making friends as a reason for participation, but a smaller percentage of Hispanics did so. Hispanics were less likely to mention doing volunteer work to help others, and Whites were less likely to mention getting help in finding a job. More than two thirds of Blacks and Hispanics emphasized religious participation as a part of their heritage. Blacks, followed by Hispanics, were more likely to join a religious organization in the hope of influencing politicians.

Individual Characteristics and Religion

The simultaneous-equation model is presented in Table 4. As indicated by *P* values <.0001 for each equation, the model's goodness-of-fit is acceptable. Organizational and non-organizational religiosity were associated with some variables in common and some different variables. Older age, being female, being Black, and citing participation in worship services and volunteering as reasons for belonging to religious organizations were associated with higher scores on the organizational and non-organizational religiosity scales. Being Hispanic, more social support, more education, better perceived personal opportunities, and help in finding a job as a reason for participation in a religious organization had a positive association with organizational religiosity. Greater fear of victimization, higher perceived racism, and participating in a religious organization because of one's heritage were positively

Table 2. Organizational and non-organizational religiosity in Whites, Blacks, and Hispanics

Question or Scale	Answers or Ranges	Whites	Blacks	Hispanics	*P* value
Organizational religiosity (Q1–2)					
Organizational religiosity scale	*Scale (1–5)*	*2.75*[B,H]	3.62[W,H]	3.20[W,B]	<.001
How often do you go to religious services?	1. never	20%	5%	11%	
	2. 1–2/year	21%	10%	12%	
	3. every month	9%	13%	12%	
	4. 1–2/month	18%	16%	23%	
	5. every week	33%	56%	43%	
	Mean (1–5)	3.25[B,H]	4.06[W,H]	3.74[W,B]	<.001
Besides religious services, how often do you take part in other activities at a place of worship?	1. never	42%	25%	42%	
	2. 1–2/year	25%	12%	13%	
	3. every month	10%	13%	8%	
	4. 1–2/month	11%	18%	12%	
	5. every week	12%	31%	25%	
	Mean (1–5)	2.25[B,H]	3.17[W,H]	2.65[W,B]	<.001
Non-organizational religiosity (Q3–5)					*<.001*
Non-organizational religiosity scale	*Scale (0–1)*	*0.86*[B]	0.96[W,H]	0.85[B]	
How often do you pray?	1. never	5%	1%	5%	
	2. 1–2/year	3%	1%	5%	
	3. every month	3%	1%	5%	
	4. 1–2/month	6%	3%	9%	
	5. every week	83%	94%	76%	
	Mean (1–5)	4.59[B,H]	4.88[W,H]	4.46[W,B]	<.001
How important are your religious or spiritual beliefs for what you do every day?	1. not at all important	5%	1%	2%	
	2. a little important	8%	2%	9%	
	3. fairly important	19%	6%	21%	
	4. very important	68%	91%	68%	
	Mean (1–4)	3.49[B]	3.87[W,H]	3.53[B]	<.001
How important are your religious or spiritual beliefs as a source of meaning in your life?	1. not at all important	4%	0%	2%	
	2. a little important	7%	2%	9%	
	3. fairly important	17%	6%	21%	
	4. very important	73%	92%	68%	
	Mean (1–4)	3.58[B]	3.90[W,H]	3.54[B]	<.001

W, B, and H denote respectively statistically significant difference from White, Black, and Hispanic in post-hoc Bonferroni pairwise comparisons. *P* values are based on one-way ANOVA tests.

associated with non-organizational religiosity.

Race/Ethnicity, Religion, and Health

Religion and Health

In the simultaneous-equation model of Table 4, organizational religiosity and non-organizational religiosity had opposite associations with health. When analyzed across all races, organizational religiosity had a positive association with mental health, while non-organizational religiosity had a negative association with physical health and mental health, after controlling for sociodemographic characteristics. Education had a consistent positive association with health, while the association between health and age and gender differed depending on the health outcomes measured.

The Role of Race

Even after controlling for sociodemographic and personal characteristics and reasons cited for belonging to a religious organization, Blacks reported higher organizational and non-organizational religiosity than Whites, and Hispanics reported higher non-organizational religiosity, These results were confirmed in additional multivariate regressions (not reported) of organizational and non-organizational religiosity on sociodemographic variables, personal characteristics, and the reasons given for being a member of a religious organization.

The simultaneous-equation model indicates the complexity of the relationships between race/ethnicity, religiosity, and health. Being Black was directly associated with lower mental health and self-rated health; however, being Black was indirectly positively associated with mental health through organized religiosity and indirectly negatively associated with physical and mental health through non-organizational religiosity (see Figure 3). Being

Table 3. Individual characteristics in Whites, Blacks, and Hispanics

Question or Scale	Answers or Ranges	Whites	Blacks	Hispanic	*P* value
Sociodemographic characteristics					
Age	Years	47[H]	48[H]	39[W,B]	<.001
Gender	Percent female	72%	71%	74%	.435
Education	Mean (1–7)	4.33[B,H]	4.08[W,H]	2.61[W,B]	<.001
Personal characteristics					
Positive characteristics					
Social support	Mean (0–11)	3.76[H]	3.85[H]	3.39[W,B]	<.001
General social trust	Mean (0–11)	0.50[B,H]	0.24[W,H]	0.28[W,B]	<.001
Perceived personal opportunity	Scale (0–1)	0.70[B,H]	0.62[W,H]	0.64[W,B]	<.001
Negative characteristics					
Perceived racism	Scale (1–5)	1.89[B,H]	2.71[W,H]	2.05[W,B]	<.001
Fear of victimization	Scale (1–5)	2.02[B,H]	2.58[W,H]	3.46[W,B]	<.001
Motivations for being a member of religious organizations					
To participate in worship services	Percent yes	78%[H]	82%[H]	69%[W,B]	<.001
To do volunteer work to help others	Percent yes	65%[H]	65%[H]	56%[W,B]	.011
To make friends	Percent yes	62%[H]	57%	54%[W]	<.001
To get help with food or clothes	Percent yes	18%[B,H]	32%[W,H]	25%[W,B]	<.001
To get help in finding a job	Percent yes	21%[B,H]	35%[W]	34%[W]	<.001
To influence politicians	Percent yes	19%[B,H]	40%[W,H]	32%[W,B]	<.001
Because it is part of our heritage	Percent yes	51%[B,H]	64%[W]	67%[W]	<.001

W, B, and H denote respectively statistically significant difference from White, Black, and Hispanic in post-hoc Bonferroni pairwise comparisons. *P* values are based on one-way ANOVA tests.

Hispanic was directly associated with worse self-rated health but was indirectly positively associated with mental health through organizational religiosity (see Figure 4).

DISCUSSION

Differences by Race/Ethnicity in Religion

African Americans

Organizational and non-organizational religiosity differed by race/ethnicity in our sample. As hypothesized and consistent with previous studies,[10,38] Blacks scored the highest in all dimensions of religiosity. Blacks had high attendance rates, despite barriers to going to church in unsafe neighborhoods. A Black woman in a focus group reported, "It's not good to be out at night, even when you are at church . . . We had to stay in after, till everybody get through shooting their guns and stuff . . . some churches let out before they shoot their guns." Blacks' religiosity involved both an intense spiritual dimension and strong roots in the community. Blacks prayed more and gave greater prominence to religious beliefs, as was also reported by Taylor et al[38] and Jacobson et al,[46] among others. As hypothesized, Blacks were more likely to look for support in religious organizations, for example help with food and clothes, in making friends, and in influencing politicians through group action. In focus groups, residents of Black neighborhoods reflected on the importance and involvement of the church in their community, saying that "religion is the very foundation of Acres Home community . . . we have a church just about every corner of every block." They also indicated their expectations for preachers "to put the community first" and explained that "in order to save souls, you need to help with the environment that the souls live in." The role of the church as social provider was seen as substantial. "The churches have assisted in literacy training for community members who could not read. The churches have also assisted in daycare facilities;" "older people will be sick or something like that, usually they'll send up a church nurse will come out to the house;" "churches have bus trips;" "some have programs for youth." African Americans also recognized that "things that have been done in our neighborhood have been done through our churches." These results mirror those of studies emphasizing the activities of African-American churches in actively supporting their communities through outreach ministries, providing social services as well as civic and political leadership.[22,39,43–45]

Hispanics

Hispanics reported higher organizational religiosity than Whites, but reported similar levels of non-organizational religiosity. As hypothesized, Hispanics indicated "being part of their

heritage" as an important reason for participation in religious organizations, underscoring the degree to which Hispanic religiosity is embedded in culture.[52] In the words of a Hispanic focus group participant: "My opinion is that [religion] is a way of thinking, a way of life, for me, for the Mexican . . . Mexicans are very religious." "I like the Catholic religion. To me it's a Mexican thing. I like that. I like heritage;" "the Mexicans, we have our altars and our candles and all." A Hispanic woman remembered her grandmother as "a church mouse." She added, "And I am going to follow it; it is a legacy."

As hypothesized, Hispanics also looked for instrumental support and civic leadership in religious organizations, though to a lesser degree than Blacks. Several Hispanics reported getting instrumental support from the church. "I know a lady that says that her kids don't dress in pure Nike, her children dress in whatever the church gives her;" "I also dress from the church;" "the churches help the Hispanics a lot. They help with food for those who do not have." Hispanics emphasized the church civic leadership, saying, "they fixed the streets because of priest Mike. He helped us organize; " "after our parish was formed, it wasn't until then that we began to see changes in the neighborhood. Thanks to God and to the priest who started the movement and the unity." Hispanic immigrants reported being grateful for the help the church provided in their new country: "I was learning English for a year in a church every Monday," and "they were the ones that lend me a hand and helped me to be what I am today."

Whites

As expected, Whites were the least likely to have a religious affiliation or to attend church. They seemed to favor a more personal form of religiosity. A White man commented, "I really don't think organized religion is a good idea . . . not that I don't speak with God on my own. That's another thing. I don't believe you need a priest to speak with God." Another added, "I think that [religion] is your own personal thing . . . I think it's your own private, what's in your heart." Consistent with the literature, Whites were also less likely to see religious organizations as source of instrumental support or providing civic leadership.[43] None of the White focus group participants talked about churches in those roles.

Individual Characteristics and Religion

Organizational and non-organizational religiosity are both associated with some individual characteristics. Consistent with previous research,[10,32,38] females and older individuals were more religious. This was noticed by focus group participants who stated that there are "more women in the church than men." When asked about the importance of religion, a Black man replied, "I think more of the senior citizens and the people around my age group. I am in the 40 age group."

Organizational and non-organizational religiosity were also associated with different individual characteristics. Characteristics indicating more social resources were associated with organizational religiosity. Individuals, therefore, who are more educated, who have more social support, and who perceive better personal opportunities scored higher on organized religiosity. On the other hand, characteristics associated with fewer social resources were associated with non-organizational religiosity. Individuals who perceive more victimization and more racism scored higher on non-organizational religiosity, consistent with the coping theory. Thus, our hypothesis that positive personal factors are associated with organizational religiosity, while negative personal factors are associated with non-organizational religiosity, is supported.

Race/Ethnicity, Religion, and Health

Religion and Health

When analyzed across all racial groups, organizational religiosity was positively associated with mental health, and non-organizational religiosity was negatively associated with physical health and mental health. Therefore, our hypothesis about the salutary effects of organizational religiosity was supported. The data supported the religious coping hypothesis for non-organizational religiosity. The picture described by the simultaneous-equation model is one where individuals with more social resources tend to have higher organizational religiosity and better health, while individuals with fewer social resources tend to have higher non-organizational religiosity and poorer health. This picture is consistent with results reported in the literature: 1) the salutary effect on individuals with more social resources[81]; 2) the salutary effect of religious attendance on health[9,37,82]; and 3) religion as a coping mechanism for those facing difficult situations.[18,29,30]

The Role of Race

The effects of race/ethnicity on religiosity and health were complex. Sociodemographic and personal factors and reasons cited for belonging to religious organizations did not explain differences in religiosity by race/ethnicity since, after controlling for sociodemographic and personal factors and motivations for belonging to religious organizations, Blacks still reported higher organizational and non-organizational religiosity and Hispanics reported higher non-organizational religiosity compared to Whites. These results contradict our main hypothesis 1 that sociodemographic, personal characteristics, and motivations for belonging to a religious organization explain racial differences in religiosity.

Furthermore, sociodemographic factors and religiosity did not completely explain racial/ethnic differences

Table 4. Simultaneous equation model for religiosity and health outcomes, *N*=2,826

Religiosity equations	Coefficients	Confidence interval		*P* value
Organizational religiosity				
Sociodemographic characteristics				
Age	0.04‡	0.03	0.05	<.01
Female	0.72‡	0.47	0.98	<.01
Education	0.09†	0.01	0.18	.03
Black	2.27‡	1.85	2.69	<.01
Hispanic	1.99‡	1.58	2.40	<.01
Positive personal characteristics				
Social support	0.12‡	0.07	0.17	<.01
General social trust	0.01	−0.03	0.04	.69
Personal opportunity	0.10‡	0.05	0.16	<.01
Negative personal characteristics				
Perceived racism	0.02	−0.05	0.10	.50
Fear of victimization	−0.02	−0.06	0.02	
Motivations for participating in a religious organization				
Worship services	1.14‡	0.86	1.42	<.01
Volunteer	0.39†	0.09	0.69	
Make friends	0.18	−0.11	0.47	.22
Help with food	−0.28*	−0.59	0.03	.01
Help finding job	−0.35†	−0.66	−0.04	.03
Influence politicians	0.00	−0.28	0.29	
Part of heritage	0.05	−0.30	0.21	.72
Equation overall significance				*<.0001*
Non-organizational religiosity				
Sociodemographic characteristics				
Age	0.02‡	0.02	0.03	<.01
Female	0.59‡	0.44	0.74	<.01
Education	0.04	−0.01	0.09	
Black	0.69‡	0.45	0.93	<.01
Hispanic	−0.01	−0.24	0.23	.95
Positive personal characteristics				
Social support	0.02	−0.01	0.05	.16
General social trust	−0.01	−0.03	0.01	.30
Personal opportunity	−0.01	−0.04	0.03	.74
Negative personal characteristics				
Perceived racism	0.08‡	0.04	0.12	<.01
Fear of victimization	0.04‡	0.01	0.06	.10
Motivations for participating in a religious organization				
Worship services	0.62‡	0.47	0.78	<.01
Volunteer	0.28‡	0.12	0.45	
Make friends	0.10	−0.06	0.26	
Help with food	−0.13	−0.30	0.04	.14
Help finding job	−0.10	−0.27	0.07	.25
Influence politicians	0.07	−0.09	0.23	
Part of heritage	0.17†	0.03	0.32	.02
Equation overall significance				*<.0001*
Health equations	**Coefficients**	**Confidence Interval**		***P* value**
Physical health				
Sociodemographic characteristics				
Age	−0.26‡	−0.30	−0.23	<.01
Female	0.10	−0.99	1.19	.86
Education	0.67‡	0.35	0.98	
Black	−1.49	−3.32	0.35	.11
Hispanic	−0.41	−2.75	1.93	.73

Table 4. Continued

Health equations	Coefficients	Confidence interval		*P* value
Religiosity				
Org religiosity	1.06*	−0.17	2.29	.09
No-org religiosity	−2.51†	−4.49	−0.54	.01
Equation overall significance				*<.0001*
Mental health				
Sociodemographic characteristics				
Age	−0.02	−0.05	0.02	.40
Female	−1.19†	−2.29	−0.10	.03
Education	0.64‡	0.33	0.96	
Black	−3.38‡	−5.23	−1.53	<.01
Hispanic	−1.77	−4.12	0.59	.14
Religiosity				
Org religiosity	1.42†	0.18	2.65	.03
No-org religiosity	−2.38†	−4.37	−0.39	.02
Equation overall significance				*<.0001*
Self-rated health				
Sociodemographic characteristics				
Age	−0.15‡	−0.25	−0.06	<.01
Female	−0.20	−1.15	0.75	.68
Education	0.64‡	0.33	0.94	
Black	−2.50‡	−4.09	−0.90	<.01
Hispanic	−3.23‡	−5.22	−1.25	<.01
Physical and mental health				
Physical health	0.24	−0.11	0.60	.18
Mental health	0.61‡	0.40	0.81	<.01
Religiosity				
Org religiosity	0.93*	−0.13	1.98	.09
No-org religiosity	−1.63*	−3.39	0.13	.07
Equation overall significance				*<.0001*

* *P* value<.10; † *P* value<.05; ‡ *P* value<.01.

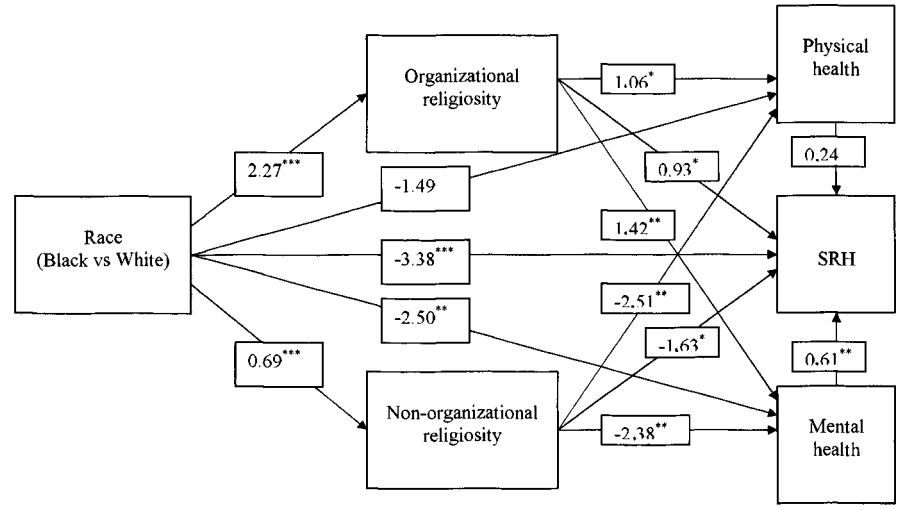
in health outcomes. While these factors explained racial/ethnic differences in physical health, they did not explain differences in mental health or in self-rated health. Race/ethnicity had both direct and indirect effects on health outcomes. Being Black had a direct negative association with mental health and self-rated health, an indirect positive association with mental health through organized religiosity, and an indirect negative association with physical and mental health through non-organizational religiosity. Being Hispanic had a direct negative association with self-rated health and an indirect positive association with mental health through organizational religiosity. The effects discussed above are to be understood within the simultaneous-equation model's framework and do not imply causality. Thus our hypotheses that the sociodemographic and personal factors investigated in this study would explain racial/ethnic differences in religiosity and health were not supported. Further research is needed to shed light on the effects of race/ethnicity on religion and health.

Pathways

Though we did not directly investigate the pathways that lead from religiosity to health, the results of the simultaneous-equation model confirm some of the possible pathways between the different dimensions of religiosity and health outcomes.

Pathways from Organizational Religion to Health

Organizational religiosity may be associated with better mental health through providing social support and networks, as well as a positive outlook on life opportunities. Several focus group participants commented on the role of the church in providing social support and opportunities: "The church forms groups that are more united and help you make friends and get moral support . . . and they let you know if anything happens that could benefit you," and "[the church] is where we be-



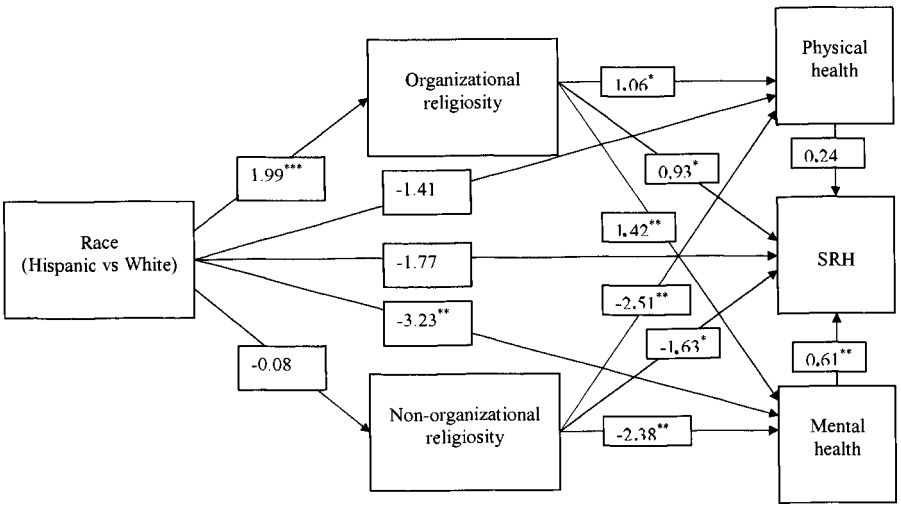
* P value < 0.10, ** P value < 0.05, *** P value < 0.01

Fig 3. Direct and indirect effects of race: Blacks compared to Whites

came aware about how our community walks with good steps towards a better future."

Pathways from Non-Organizational Religion to Health

Like other studies[31,32] that found that individuals who are disenfranchised and who have difficult lives tend to turn to religious coping, the results of this study suggest that the negative association of non-organizational religiosity with health is consistent with religious coping. Non-organizational religiosity was possibly associated with worse health because it reflects religious coping by individuals facing poor health as well as victimization and racism. Religious coping manifests itself as higher intensity of prayer and more salience of religious beliefs by those perceiving a more hostile environment. This interpretation is underscored by results from the focus groups where several participants commented on religious coping when faced with difficult conditions. After gangs moved into her neighborhood and beat up a boy so badly that "he was like a vegetable," a Black woman dealt with the problem through prayer, saying, "I am going to take charge of this . . . I started praying, praying around that baseball field." A Black man living in difficult conditions ("where I live on the streets, and I live from day to day, to try to survive, eat here, eat there") said, "I think the Lord is the most important thing. Believing in the Lord; doing his work." A Hispanic woman remarked that "faith is where I get my strength to keep going forward . . . to defeat the problems in front of me." Other Hispanic women reiterated the importance of prayer in dealing with difficult conditions: "When my husband died about 10 years ago . . . the church, that's the one thing that helped me; prayer and work;" "the burdens are lifted up . . . when they prayed."



* P value < 0.10, ** P value < 0.05, *** P value < 0.01

Fig 4. Direct and indirect effects of race: Hispanics compared to Whites

Non-organizational religiosity was possibly associated with worse health because it reflects religious coping by individuals facing poor health as well as victimization and racism.

Limitations

Finally, this study has several limitations. First, it uses cross-sectional data, thus precluding any conclusions about the direction of causality. While focus group information may shed some light on the processes involved, these results are only illustrative and do not make

any claims about the causal process. Ultimately, longitudinal data are necessary to establish causal order. Second, the sample consisted of predominantly female individuals, mainly minority, living in low-SES neighborhoods in Texas. The processes described in this study may not apply to other groups and can not be generalized. Despite these limitations, however, the richness of data that this study provides illustrates the complex relationships between race/ethnicity, religiosity, sociodemographic and personal factors, and their effects on the health of individuals.

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