Does religion buffer the effect of childhood abuse on adult sleep quality? Differences by race

Brian L. McPhail, *Purdue University*

Purdue University

Department of Sociology

700 W. State Street

West Lafayette, Indiana 47907-2059

Abstract

This study examines the potential of religious involvement to buffer the deleterious effects of childhood abuse on adult sleep quality and whether the buffering effect of religion varies by race. Using cross-sectional data from the Midlife in the United States Study (MIDUS) (n = 1,767), I estimated logistic regression models with interaction terms to test whether four measures of religious involvement–religious attendance, private prayer, religious social support, and religious coping–reduce the accumulated impact of emotional, physical, and severe physical childhood abuse on chronic sleep problems in adulthood. Findings indicate that Black adults were significantly more likely than White adults to have chronic sleep problems. The effect of childhood abuse on sleep quality, however, does not vary by race. Religious attendance and religious social support

buffered the effect of having all three types of childhood abuse on the probability of having chronic sleep problems but only for Black adults. Private prayer and religious coping did not reduce associations between childhood abuse and chronic sleep problems in adulthood for either Black or White adults. These findings support assertions that religious involvement and the psychosocial resources they provide can protect against the later life health consequences of childhood adversity.

Keywords: child abuse, sleep, religiosity, race

Introduction

Research has well documented the later life physical and mental health consequences of childhood adversity (Anda et al., 2006; Chapman et al., 2004; Hughes et al., 2017; Shonkoff et al., 2012). Links between early life adversity and adult health are partially mediated by contexts and exposures during adulthood (Haas and Rohlfsen, 2010; Hayward and Gorman, 2004; Turner et al., 2016; Umberson et al., 2014), suggesting that the long-term effects of childhood adversity can be buffered or reversed (Ferraro and Shippee, 2009; Karatsoreos and McEwen, 2013; Nurius et al., 2016). Not all individuals with experiences of childhood adversity suffer health effects as adults; many are resilient to the harmful consequences of childhood stressors and trauma. Among the factors associated with greater resilience are the presence of psychosocial resources, coping skills, and social support (Mc Elroy and Hevey, 2014; Pearlin, 1989; Pitzer and Fingerman, 2010; Rutter, 1987). In particular, religion has been identified as a possible domain from which to draw these resources for reducing the harmful effects of childhood adversity (Brewer-Smyth and Koenig, 2014; George et al., 2002; Jung, 2018).

Racial differences in both health outcomes and religiosity suggest that religious involvement may not be equally effective in buffering negative health effects across racial groups. In the United States, racial/ethnic disparities in health persist, with Black Americans disproportionately burdened by higher rates of morbidity, mortality, and disability (Centers for Disease Control and Prevention, 2013; Mays et al., 2007; Williams and Jackson, 2005; Williams and Sternthal, 2010). Risks of childhood adversities are also higher for Black Americans (Liu et al., 2018; Slopen et al., 2016), and research has shown that stress and adverse childhood experiences are an important factor in these health disparities (Sternthal et al., 2011; Umberson et al., 2014). In addition to health differences, the distinctive nature and function of religion in the Black

population of the United States may promote physical and mental health in ways unique to Black individuals (Ellison et al., 2010; Mattis and Jagers, 2001; Taylor et al., 2004). Studies show that religious involvement among Black Americans is associated with higher levels of social support (Assari, 2013; Le et al., 2016) and religious coping (Krause et al., 2001), both of which have been found to have stress-buffering effects (Beale, 1997; Bierman, 2006; Ellison et al., 2008; Henderson, 2016; Henderson et al., 2016; Krause, 2006a, 2002a).

The aim of this study is to examine 1) whether religious involvement buffers the later life physical health consequences of childhood adversity and 2) whether the buffering effect of religion varies by race. To accomplish this, I investigate the effect of religion on associations between childhood abuse—an especially harsh form of childhood adversity—and sleep quality in adulthood. Childhood adversity, in general, and childhood abuse, in particular, have long-term consequences for adult sleep (Bader et al., 2007; Chapman et al., 2011; Greenfield et al., 2011; Gregory et al., 2006; Koskenvuo et al., 2010; Poon and Knight, 2011). Evidence also suggests that the negative effects of life stressors—such as child abuse—on future mental and physical health are partially mediated by sleep (Bøe et al., 2012; Chen and Yang, 2014; Hall et al., 1998; Hisler and Brenner, 2019; Lee et al., 2014). Furthermore, sleep quality is an important contributor to racial and socioeconomic health disparities (Grandner et al., 2016; Laposky et al., 2016), as Black individuals suffer greater levels of sleep difficulty than White individuals (Durrence and Lichstein, 2006; Hale and Do, 2007; Hicken et al., 2013; Ruiter et al., 2010). Using a large nationally representative sample of US adults with an oversample of African Americans, I test whether various measures of religious involvement buffer the effect of childhood abuse on chronic sleep problems in adulthood and whether the buffering effect of religion differs between Black and White adults.

Theoretical and empirical background

Childhood abuse and sleep problems in adulthood

Adverse childhood experiences are early life stressors that have long-term negative consequences on sleep quality during adulthood (Bader et al., 2007; Chang et al., 2019; Chapman et al., 2011; Gregory et al., 2006; Kajeepeta et al., 2015; Koskenvuo et al., 2010; Poon and Knight, 2011). In particular, experiences of childhood abuse and neglect are associated with sleep disruptions and negative sleep quality later in life (Bader et al., 2007; Gelaye et al., 2015; Greenfield et al., 2011; Poon and Knight, 2011). Studies have also shown that the negative effects of social stressors such as child abuse on later-life mental and physical health are partially mediated by sleep (Bøe et al., 2012; Hall et al., 1998; Hisler and Brenner, 2019; Lee et al., 2014).

A life course approach to health asserts that early life traumas such as childhood abuse have the potential to impact physical and psychological health in later life through both biological and social pathways (Kuh et al., 2003). Adverse experiences such as abuse prompt hyperarousal and the chronic activation of stress response systems that cause developmental and biological disruptions affecting the neuroendocrine regulation of sleep (Germain et al., 2008; Gregory et al., 2006; Morin, 1993). Such physiological changes can result in sleep disruptions and chronic sleep problems throughout the life course.

Childhood Adversity and Religion as a Psychosocial Resource

Although childhood adversity has long-term consequences for individuals' health conditions across the life course (Anda et al., 2006; Felitti et al., 1998; Hughes et al., 2017), some research suggests that the effects of childhood adversity on adult health can be buffered and possibly reversed (Ferraro and Shippee, 2009; Karatsoreos and McEwen, 2013; Nurius et al., 2016; Pitzer

and Fingerman, 2010). The stress process model, and its framework for understanding how individuals respond to stressors, proposes that available social support, coping skills, and other psychosocial resources (e.g., personal control, self-esteem) may moderate the influence of a given stressor on the likelihood of exposure to additional stressors and, therefore, prevent the accumulation of health risks (Mc Elroy and Hevey, 2014; Pearlin, 1989; Rutter, 1987). Similarly, cumulative disadvantage theory describes *countervailing mechanisms* that individuals may use to reduce the effect of early life disadvantages on risks of later life disadvantages (Ferraro and Kelley-Moore, 2003). The availability of these psychosocial resources and/or countervailing mechanisms may help explain why some individuals who experience childhood adversity suffer long-term health consequences while others do not.

Religion is one life domain from which individuals may draw psychosocial resources for coping with stress and developing resilience (Brewer-Smyth and Koenig, 2014; Ellison et al., 2011; George et al., 2002; Pargament, 2001; Schieman et al., 2013). Religious coping has been found to moderate the harmful physical health and mental health effects of stress (Bierman et al., 2018; Harrison et al., 2001; Pargament et al., 1988; Thuné-Boyle et al., 2006). Although the role of religion in promoting resilience among adults who have experienced early life adversity is understudied, scholars have begun to make arguments for the potential of religion/spirituality and faith-based participation to impact behavioral and biological aspects of stress resilience among victims of childhood trauma (Brewer-Smyth and Koenig, 2014; Ferraro and Koch, 1994; George et al., 2002).

A large research literature demonstrates associations between religious involvement and physical health (Ferraro and Kim, 2014; George et al., 2000; Koenig et al., 2012; Powell et al., 2003), mental health (Ellison, 1995; Hackney and Sanders, 2003; Koenig, 2015; Levin and

Chatters, 1998; Schnittker, 2019), and behavioral health (Ellison and Levin, 1998; Hill et al., 2006). A few studies even show evidence of links between religiousness and sleep quality (Gonnerman et al., 2008; Hill et al., 2018; Krause and Ironson, 2017). Several psychosocial mechanisms are believed to mediate the relationship between religion and health: 1) health practices, 2) social support, 3) psychosocial resources such as self-esteem, personal control, and coping skills, and 4) belief structures that produce a sense of coherence or meaning (Ellison and George, 1994; Ellison et al., 2011; George et al., 2002; Koenig, 2015; Schieman et al., 2013). Studies show the potential of religion–via these mechanisms–to moderate the effects of life stressors on health, particularly on mental health outcomes (Bierman, 2006; Bradshaw and Ellison, 2010; Jung, 2018; Shah, 2019; Wink et al., 2005). A few studies, however, have demonstrated religion's role in buffering deleterious effects of life stressors on sleep quality (Bierman et al., 2018; Ellison et al., 2019). Given the overall positive associations between religion and health outcomes as well as the research evidence of religion's stress-buffering effects, I hypothesize that higher levels of religiosity as measured by religious attendance, prayer, religious social support, and religious coping will reduce the positive association between childhood abuse and chronic sleep problems.

Differences in the Buffering Effects of Religion by Race

Religious involvement may buffer the effects of childhood abuse on adult sleep quality more strongly for Black adults than for White adults. In general, Black Americans report higher levels of religious affiliation, religious attendance, participation in religious programs (i.e., prayer groups, scripture study groups, religious education), daily prayer, and weekly scripture reading than White Americans (Pew Research Center, 2015, pp. 72–81). In addition, Black Christians and churches have been characterized by beliefs and perspectives that may be related to better

physical and mental health as well as resilient functioning (Ellison et al., 2010; Mattis and Jagers, 2001; Taylor et al., 2004). Specifically, many Black Protestant churches emphasize a "theology of survival" comprised of themes such as liberation, redemption, and personal triumph that have helped Black Americans cope with difficult and oppressive life circumstances (Cone, 1997; Lincoln and Mamiya, 1990; Maynard-Reid, 2000; Paris, 1985).

Research also suggests that the health benefits of religion are greater for Black Americans than for White Americans (Assari, 2013; Ferraro and Kim, 2014; Krause, 2002a). In dealing with stressful life situations, Black adults are more likely to turn to religious coping (Chatters et al., 2008) and congregation-based social support than White adults (Debnam et al., 2012; Hayward and Krause, 2013; Krause, 2002b; Taylor et al., 2017). Religious coping (Beale, 1997; Bierman, 2006; Ellison et al., 2008; Henderson, 2016; Henderson et al., 2016; Krause and Van Tran, 1989) and church-based social support (Chatters et al., 2015; Krause, 2006a, 2006b; Taylor and Mateyka, 2011) have both been found to reduce the deleterious physical and mental health impacts of life stresses among Black adults. Given the racial/ethnic disparities in health, the distinctive role of religion among Black Americans, and the race differences in associations between religion and health outcomes, I hypothesize that the buffering effects of religious involvement will be greater for Black adults than for White adults.

Methods

Sample and Design

This study uses data from the National Survey of Midlife Development in the United States (MIDUS), a national longitudinal study of the social, psychological and behavioral factors

related to physical and mental health in adulthood. The first wave (MIDUS 1, 1995-1996) was administered in two-stages (a phone interview and a self-administered questionnaire) and obtained a nationally representative core sample of non-institutionalized, American adults between the ages of 25 and 74 (n = 3,034, 74% response rate). About 9 years later, a second wave MIDUS 2 (2004-2006) conducted follow-up phone interviews and self-administered questionnaires with MIDUS 1 core sample respondents (n = 1,805, 76.1% mortality adjusted response rate). In order to increase minority representation, MIDUS also added an oversample of African Americans (MIDUS Milwaukee, 2005-2006) between the ages of 35 and 85 and living in Milwaukee (n = 398, 67.2% response rate).

For these analyses, a dataset was constructed by merging MIDUS 1 and MIDUS 2 and then appending the MIDUS Milwaukee sample (n = 2,203). Respondents' experiences with abuse during childhood were only measured in MIDUS 1; all other analysis variables were measured in MIDUS 2. The MIDUS Milwaukee questionnaire included all relevant survey items from both MIDUS 1 and MIDUS 2. The data were further subset by excluding 138 respondents who identified with racial groups other than White or Black or for whom racial identity was not provided, and 146 respondents who indicated that they did not have a mother and a father figure in their family during childhood. To handle missing data due to item non-response, I used listwise deletion, which excluded 151 respondents (6.9%) from these analyses. The final analytic sample comprised of 1,767 adult with complete information for all model covariates.

Dependent Variable

Chronic Sleep Problems—The dependent variable is a dichotomous measure of chronic sleep problems. MIDUS 2 asked respondents, "In the past 12 months, have you experienced or been

treated for any of the following? Chronic sleeping problems." Response options included 1 = *yes* or 0 = *no*.

Independent Variable

Self-report of Childhood Abuse—The focal independent variable in these analyses is a measure of the accumulation of types of abuse during childhood. Six questions in MIDUS 1 and MIDUS Milwaukee, which are based on a revised version of the Conflict Tactics Scale (Straus, 1979; Straus et al., 1996), asked respondents to retrospectively report how frequently they experienced three types of abuse: emotional abuse (i.e., being insulted, sworn at, threatened with violence, or ignored), physical abuse (i.e., being pushed, grabbed, shoved, slapped, or having something thrown at you), and severe physical abuse (i.e., being beaten up, kicked, hit with a fist, choked, or burned/scalded) by their father (or father figure) and by their mother (or mother figure). Response options included: *never*, *rarely*, *sometimes*, and *often*. I created dichotomous measures to indicate which respondents frequently experienced each type of abuse (0 = *never* or *rarely*, 1 = *sometimes* or *often*) (Greenfield and Marks, 2010, 2009; Irving and Ferraro, 2006), and then summed the number of abuse types respondents reported experiencing during childhood (1 = *no frequent experience of childhood abuse*, 2 = *frequently experienced some (1-2) types of childhood abuse*, 3 = *frequently experienced all 3 types of childhood abuse*) (Chen et al., 2016; Greenfield, 2010; Lee et al., 2014).

Moderating Variables

Frequency of Religious Attendance—Religious attendance is measured using the MIDUS 2 question, "Within your religious or spiritual tradition, how often do you: attend religious or spiritual services?" Response options, which are reverse coded, include: 1 = *never*, 2 = *less than*

once per month, 3 = *1-3 times per month*, 4 = *once a week*, 5 = *a few times a week*, and 6 = *once a day or more*.

Frequency of Private Prayer—Private prayer is measured using the MIDUS 2 question, "Within your religious or spiritual tradition, how often do you: pray in private?" Response options, which are reverse coded, include: 1 = *never*, 2 = *less than once per month*, 3 = *1-3 times per month*, 4 = *once a week*, 5 = *a few times a week*, and 6 = *once a day or more*.

Religious Social Support—Religious social support is measured as a scale calculated from two survey questions: a) "If you were ill, how much would people in your congregation help you out?" and b) "If you had a problem or were faced with a difficult situation, how much comfort would people in your congregation be willing to give you?" Response options for each question include: 1 = *none*, 2 = *a little*, 3 = *some*, and 4 = *a great deal*. The scale is calculated as the mean of the responses to these two questions and ranges from 1 to 4 (α = .90). Respondents who indicated that they did not have "a religious community or congregation" were imputed a value of 1 which represents no religious social support on the scale.

Religious Coping—Religious coping is measured as an index calculated from six survey questions: a) "I try to make sense of the situation and decide what to do without relying on God," b) "I wonder whether God has abandoned me," c) "I feel God is punishing me for my sins or lack of spirituality," d) "I look to God for strength, support and guidance," e) "I work together with God as partners," and f) "I think about how my life is part of a larger spiritual force." Response options for each question include: 1 = *none*, 2 = *a little*, 3 = *some*, and 4 = *a great deal*. The scale is calculated as the mean of the responses to these six questions and ranges from 1 to 4 (α = .72).

Control Variables

These analyses also include the following health and sociodemographic control variables: age (in years), gender (0 = *men*, 1 = *women*), education level (1 = *less than high school*, 2 = *high school*, 3 = *some college*, 4 = *4-year college degree*), marital status (1 = *married*, 2 = *divorced/separated*, 3 = *widowed*, and 4 = *never married*), parent (0 = *no children*, 1 = *has children*), currently employed (0 = *not currently employed*, 1 = *currently employed*), household income (logged dollars), depression or anxiety (0 = *Not experienced or been treated for anxiety, depression, or some other emotional disorder in past 12 months*, 1 = *has experienced or been treated for anxiety, depression, or some other emotional disorder in past 12 months*), and history of heart trouble (0 = *has never had heart trouble*, 1 = *has had heart trouble suspected or confirmed by doctor*).

Analytic Strategy

The analyses in this study followed several steps. First, I calculate descriptive statistics for all model variables stratified by race and test for mean differences between Black and White respondents. Next, I conduct logistic regression analyses to examine the bivariate association between childhood abuse and the probability of having chronic sleep problems in adulthood and to test whether this association is different for Black and White respondents. Model 1 includes childhood abuse, race, and a product term between race and childhood abuse as covariates. Then, to independently whether each measure of religious involvement buffers the effect of childhood abuse on sleep problems differently for Black and White respondents, Models 2-5 introduce a separate three-way interaction term between a measure of religious involvement, childhood abuse, and race. Models 2-5 also include all measures of religious involvement as well as the health and socio-demographic control variables as covariates.

Because the coefficient on the product terms is not a reliable significance test of an interaction effect in non-linear categorical models (Ai and Norton, 2003; Mustillo et al., 2018), I test and interpret the buffering effect of religion and differences by race using marginal effects in terms of the predicted probabilities (Long and Freese, 2014; Long and Mustillo, 2018; Mize, 2019). In short, a marginal effect summarizes the effect of an independent variable as the difference between two model predictions (Mize, 2019). This approach has several advantages: 1) it provides a straightforward summary measure of an independent variable's effect in the natural metric of the dependent variable, the predicted probabilities, 2) it avoids the identification problems due to scaling in logit/probit models (Ai and Norton, 2003; Long and Freese, 2014), and 3) it simplifies the interpretation of complex models with interaction terms and their constitutive parts.

[Table 1 about here]

Results

Table 1 presents descriptive statistics both for the entire MIDUS sample and for Black and White respondents separately. Overall, 12.1 % of the total sample reported having experienced or been treated for chronic sleeping problems in the past 12 months. Black respondents were significantly more likely to have chronic sleep problems (18.2 %) than White respondents (10.5 %). About 10.5 % of the MIDUS sample experienced all types of childhood abuse and 58.8 % experienced no childhood abuse. Black respondents, however, were significantly more likely to have experienced all types of childhood abuse (14.9 %) compared to Whites (9.3 %). Black respondents also reported significantly greater religious involvement across all four measures.

[Figure 1 about here]

Results from Model 1, which is an unadjusted model testing whether bivariate associations between child abuse and chronic sleep problems vary by race, are plotted as predicted probabilities in Figure 1. In general, associations between childhood abuse and chronic sleep problems appear stronger for Black adults than for White adults. Figure 1 suggests that there may be a racial gap in the effect of each level of childhood abuse on chronic sleep problems. Black respondents who experienced all three types of childhood abuse have a .333 probability of having chronic sleep problems compared to about a .176 probability for White respondents (Δ = .158; $p < .05$). Similarly, for respondents who experienced no abuse during childhood, the probability of having chronic sleep problems is .080 for Whites and .148 for Blacks (Δ = .068; $p < .05$). The size of these race differences, however, are not significantly different across each level of childhood abuse, indicating that associations between each level of childhood abuse and chronic sleep problems are not any greater for Black adults than for White adults.

[Table 2 about here]

Table 2 presents the results from adjusted logistic regression models (Models 2-5) that include a single three-way interaction term between a measure of religious involvement, childhood abuse, and race. These models test whether religious attendance, private prayer, religious support, and religious coping buffer the effect of childhood abuse on chronic sleep problems and whether there are differences by race. The average marginal effects (AME) presented in Table 2 represent the buffering effects of each measure of religious involvement at each level of childhood abuse and for Black and White adults separately (see Online Appendix 1 for a full table with odds ratios). The results of these models suggest that among White adults

religious involvement does not reduce the effect of childhood abuse on the probability of having later life sleep problems. The AMEs for the buffering effects of religious attendance, private prayer, religious support, and religious coping are not statistically significant at any level of childhood abuse for the White sample, providing no evidence that religious involvement reduces the association between childhood abuse and adults sleep quality for White adults.

For the Black sample, model results indicate that religious attendance and religious social support significantly buffer the harmful effects of childhood abuse on sleep quality but only for Black adults who experienced the greatest amount of accumulated abuse. On average, frequency of religious attendance greatly reduces the harmful effect of experiencing all types of childhood abuse on sleep quality (AME = -.067; $p < .10$). This buffering effect is greater for Black adults than for White adults (race difference = -.081; $p < .05$). Similarly, religious social support also reduces the association between experiencing all types of childhood abuse and the probability of having chronic sleep problems among Black adults (AME = -.096; $p < .05$). The buffering effect of religious social support is significantly greater for Black adults than for White adults (race difference = -.122; $p < .05$). Private prayer and religious coping have no buffering effect for Black adults.

[Figure 2 about here]

To illustrate the racial difference in the buffering effect of religious attendance, Figure 2 plots the predicted probabilities (from Model 2) of having chronic sleep problems across the range of religious attendance for each level of childhood abuse and for Black and White respondents separately. Regardless of level of childhood abuse, frequency of attendance at religious services has no significant buffering effect for White respondents. Figure 2 shows that among White adults the predicted probability of having chronic sleep problems varies little

across levels of childhood abuse and frequency of religious attendance. However, the third panel in Figure 2 reveals a sharp decrease in the probability of having chronic sleep problems among Black adults who experienced all three types of childhood abuse as their reported frequency of religious attendance increases. For example, the predicted probability of having chronic sleep problems for those who never attend religious services is .465 compared to .193 for those who attend a few times per week (Δ = -.272; $p < .10$). These results indicate that attending religious services more than once a week completely buffers the harmful effects of childhood abuse on chronic sleep problems for Black adults. The predicted probability of having chronic sleep problems for Black adults who experienced *all types of child abuse* and attend religious services more than once a week (Pr = .193) is no different from Black adults who experienced *no childhood abuse* and attend religious services a few times a week (Pr = .197; Δ = -.004; p = n.s.) and is no different from White adults who experienced *no childhood abuse* and attend religious services a few times a week (Pr = .106; Δ = .087; p = n.s.).

[Figure 3 about here]

Similarly, Figure 3 plots the predicted probabilities (from Model 4) of having chronic sleep problems across the range of religious social support at each level of childhood abuse and for Blacks and Whites separately. The bottom panel in Figure 3 shows a sharp decrease in the probability of having chronic sleep problems among Black adults who experienced all three types of childhood abuse as their reported level of religious social support increases. For example, the predicted probability of having chronic sleep problems for those who have no religious social support is .443 compared to .154 for those who report the highest level of religious social support (Δ = -.289; $p < .05$). These results indicate that high levels of congregation-based social support completely buffer the harmful effects of childhood abuse on

chronic sleep problems for Black adults. The predicted probability of having chronic sleep problems for Black adults who experienced *all types of child abuse* and have the highest level of religious social support (Pr = .154) is no different from Black adults who experienced *no childhood abuse* and reported the highest level of religious social support (Pr = .207; Δ = -.053; p = n.s.) and is no different from White adults who experienced *no childhood abuse* and reported the highest level of religious social support (Pr = .092; Δ = .062; p = n.s.).

Discussion

Adverse childhood experiences have negative consequences on adult health (Anda et al., 2006; Chapman et al., 2004; Hughes et al., 2017; Shonkoff et al., 2012). Little, however, is known about whether these effects can be buffered. Using logistic regression analyses with three-way interactions between measures of religious involvement, childhood abuse, and race, I tested whether religious involvement buffers the harmful effects of childhood abuse on adult sleep quality and whether the buffering effects of religion vary between Black and White Americans. The findings in this study indicate that frequency of religious attendance and level of religious support completely buffered the harmful effects of childhood abuse on sleep in adulthood but only among Black adults who experienced the most accumulated childhood abuse (emotional, physical, and severe physical abuse). For White respondents in this sample, none of the four measures of religious involvement had a significant buffering effect; and for Black respondents, private prayer and religious coping did not protect against the effects of childhood abuse on adult sleep.

Consistent with the stress-process model, cumulative disadvantage theory, and prior research on associations between religion and health, this study provides evidence that adult religious

involvement has the potential to buffer the long-term health effects of childhood adversity. Scholars have argued that religion provides psychosocial resources and social support for resilience in those who experienced childhood adversity (Brewer-Smyth and Koenig, 2014; George et al., 2002), which have been found to protect against the long-term physical and mental health consequences of childhood stressors (Mc Elroy and Hevey, 2014; Pearlin, 1989; Pitzer and Fingerman, 2010; Rutter, 1987). This study suggests that frequent attendance at religious services and high levels of congregation-based social support provide resources for developing resilience and/or coping with the adult stresses associated with childhood abuse.

This study also demonstrates that the protective health effects of religious involvement may be greater for Black Americans than for White Americans. Because the risks of childhood adversity (Liu et al., 2018; Slopen et al., 2016) and poor health (Centers for Disease Control and Prevention, 2013; Mays et al., 2007; Williams and Jackson, 2005; Williams and Sternthal, 2010) are higher among Black Americans and because religion plays a distinctive role in the lives of Black Americans (Ellison et al., 2010; Krause, 2002a; Taylor et al., 2004), I expected that the stress-buffering effects of religion would be greater for the health of Black Americans. The results of this study support this hypothesis, showing that religious attendance and religious social support protect Black Americans—but not White Americans—from the harmful effects of childhood abuse on adult sleep quality. These results are consistent with prior studies examining the role of religious attendance (Bierman, 2006; Bradshaw and Ellison, 2010; Ellison et al., 2008; Henderson et al., 2016) and religious social support (Assari, 2013; Chatters et al., 2015; Krause, 2006a, 2006b; Taylor and Mateyka, 2011) in reducing the harmful health effects of life stresses among Black Americans. However, this study did not find buffering effects for religious coping as have some previous studies have (Beale, 1997; Henderson, 2016; Henderson et al.,

2016; Krause and Van Tran, 1989). This may be due to differences in measurement of religious coping or differences in the effects of childhood adversity and more contemporaneous social stressors on adult health.

Several study limitations warrant mention. First, these analyses use retrospective measures of childhood abuse which may be biased due to errors in recalling experiences in the past. Second, this study is unable to identify the mechanisms by which religious attendance moderates the influence of childhood abuse on sleep in Black adults. Several possible explanations for how religious attendance impacts health, namely social support and religious coping resources, were included in the models of this study to account for possible indirect effects. Future research is needed to identify these intervening processes. Third, the cross-sectional nature of these data limit the ability to analyze associations between the life-course trajectories of religious involvement and chronic sleep problems. For example, is regular attendance at religious services for a few months or a year enough to mitigate the harmful effects of abuse on sleep quality? Or is ongoing religious attendance throughout adulthood needed to experience the benefits for sleep? Longitudinal data are necessary to determine whether the timing and duration of religious attendance and religious support in the life course influence the buffering effects of religion.

Overall, this study is consistent with prior research on adult health outcomes of childhood abuse (Pitzer and Fingerman, 2010) and indicates that experiences of childhood adversity are not deterministic of later health. The findings of this study demonstrate that the harmful effects of childhood abuse on sleep in adulthood may be reduced for those who frequently attend religious services and have high levels of congregation-based social support. Additional research may further reveal the potential of religion to provide resources that buffer the deleterious effects of childhood adversity on adult health. Given the linkages between sleep and numerous mental and

physical health problems (Baglioni et al., 2011; Buxton and Marcelli, 2010; Cappuccio et al., 2010) as well as other adverse health-related quality of life behaviors (Strine and Chapman, 2005), identifying factors associated with greater resilience for those who experienced childhood adversity has broader implications for promoting long-term health and longevity.

References

Ai, C., Norton, E.C., 2003. Interaction terms in logit and probit models. Economics Letters 80, 123–129. https://doi.org/10.1016/S0165-1765(03)00032-6

Anda, R.F., Felitti, V.J., Bremner, J.D., Walker, J.D., Whitfield, C., Perry, B.D., Dube, S.R., Giles, W.H., 2006. The enduring effects of abuse and related adverse experiences in childhood. European Archives of Psychiatry and Clinical Neuroscience 256, 174–186. https://doi.org/10.1007/s00406-005-0624-4

Assari, S., 2013. Race and Ethnicity, Religion Involvement, Church-based Social Support and Subjective Health in United States: A Case of Moderated Mediation. International Journal of Preventive Medicine 4, 208–217.

Bader, K., Schäfer, V., Schenkel, M., Nissen, L., Schwander, J., 2007. Adverse childhood experiences associated with sleep in primary insomnia. Journal of Sleep Research 16, 285–296. https://doi.org/10.1111/j.1365-2869.2007.00608.x

Baglioni, C., Battagliese, G., Feige, B., Spiegelhalder, K., Nissen, C., Voderholzer, U., Lombardo, C., Riemann, D., 2011. Insomnia as a predictor of depression: A meta-analytic evaluation of longitudinal epidemiological studies. Journal of Affective Disorders 135, 10–19. https://doi.org/10.1016/j.jad.2011.01.011

Beale, R.L., 1997. Multiple familial-worker role strain and psychological well-being: Moderating effects of coping resources among Black American parents, in: Family Life in Black America. Sage Publications, Inc, Thousand Oaks, CA, US, pp. 132–145.

Bierman, A., 2006. Does religion buffer the effects of discrimination on mental health? Differing effects by race. Journal for the Scientific Study of Religion 45, 551–565.

Bierman, A., Lee, Y., Schieman, S., 2018. Chronic Discrimination and Sleep Problems in Late Life: Religious Involvement as Buffer. Research on Aging 40, 933–955. https://doi.org/10.1177/0164027518766422

Bradshaw, M., Ellison, C.G., 2010. Financial hardship and psychological distress: Exploring the buffering effects of religion. Social Science & Medicine 71, 196–204. https://doi.org/10.1016/j.socscimed.2010.03.015

Brewer-Smyth, K., Koenig, H.G., 2014. Could Spirituality and Religion Promote Stress Resilience in Survivors of Childhood Trauma? Issues in Mental Health Nursing 35, 251–256. https://doi.org/10.3109/01612840.2013.873101

Buxton, O.M., Marcelli, E., 2010. Short and long sleep are positively associated with obesity, diabetes, hypertension, and cardiovascular disease among adults in the United States. Social Science & Medicine 71, 1027–1036. https://doi.org/10.1016/j.socscimed.2010.05.041

Bøe, T., Hysing, M., Stormark, K.M., Lundervold, A.J., Sivertsen, B., 2012. Sleep problems as a mediator of the association between parental education levels, perceived family economy and poor mental health in children. Journal of Psychosomatic Research 73, 430–436. https://doi.org/10.1016/j.jpsychores.2012.09.008

Brim, O.G., Baltes, P.B., Bumpass, L.L., Cleary, P.D., Featherman, D.L., Hazzard, W.R., Kessler, R.C., Lachman, M.E., Markus, H.R., Marmot, M.G., Rossi, A.S., Ryff, C.D., Shweder, R.A., 2019. Midlife in the United States (MIDUS 1), 1995-1996. https://doi.org/10.3886/ICPSR02760.v18

Cappuccio, F.P., D'Elia, L., Strazzullo, P., Miller, M.A., 2010. Sleep Duration and All-Cause Mortality: A Systematic Review and Meta-Analysis of Prospective Studies. Sleep 33, 585–592. https://doi.org/10.1093/sleep/33.5.585

Centers for Disease Control and Prevention, 2013. CDC Health Disparities and Inequalities Report United States, 2013. Morbidity and Mortality Weekly Report 62.

Chang, L.-Y., Wu, C.-C., Yen, L.-L., Chang, H.-Y., 2019. The effects of family dysfunction trajectories during childhood and early adolescence on sleep quality during late adolescence: Resilience as a mediator. Social Science & Medicine 222, 162–170. https://doi.org/10.1016/j.socscimed.2019.01.010

Chapman, D.P., Wheaton, A.G., Anda, R.F., Croft, J.B., Edwards, V.J., Liu, Y., Sturgis, S.L., Perry, G.S., 2011. Adverse childhood experiences and sleep disturbances in adults. Sleep Medicine 12, 773–779. https://doi.org/10.1016/j.sleep.2011.03.013

Chapman, D.P., Whitfield, C.L., Felitti, V.J., Dube, S.R., Edwards, V.J., Anda, R.F., 2004. Adverse childhood experiences and the risk of depressive disorders in adulthood. Journal of Affective Disorders 82, 217–225. https://doi.org/10.1016/j.jad.2003.12.013

Chatters, L.M., Taylor, R.J., Jackson, J.S., Lincoln, K.D., 2008. Religious coping among African Americans, Caribbean Blacks and Non-Hispanic Whites. Journal of Community Psychology 36, 371–386. https://doi.org/10.1002/jcop.20202

Chatters, L.M., Taylor, R.J., Woodward, A.T., Nicklett, E.J., 2015. Social Support from Church and Family Members and Depressive Symptoms Among Older African Americans. The American Journal of Geriatric Psychiatry, Geriatric Psychiatry in Racial/Ethnic Minorities 23, 559–567. https://doi.org/10.1016/j.jagp.2014.04.008

Chen, D., Yang, T.C., 2014. The pathways from perceived discrimination to self-rated health: An investigation of the roles of distrust, social capital, and health behaviors. Social Science & Medicine 104, 64–73. https://doi.org/10.1016/j.socscimed.2013.12.021

Chen, E., Turiano, N.A., Mroczek, D.K., Miller, G.E., 2016. Association of Reports of Childhood Abuse and All-Cause Mortality Rates in Women. JAMA Psychiatry 73, 920–927. https://doi.org/10.1001/jamapsychiatry.2016.1786

Cone, J.H., 1997. God of the oppressed. Orbis Books.

Debnam, K., Holt, C.L., Clark, E.M., Roth, D.L., Southward, P., 2012. Relationship between religious social support and general social support with health behaviors in a national sample of African Americans. Journal of Behavioral Medicine 35, 179–189. https://doi.org/10.1007/s10865-011-9338-4

Durrence, H.H., Lichstein, K.L., 2006. The sleep of African Americans: A comparative review. Behavioral Sleep Medicine 4, 29–44. https://doi.org/10.1207/s15402010bsm0401_3

Ellison, C.G., 1995. Race, religious involvement and depressive symptomatology in a southeastern U.S. Community. Social Science & Medicine 40, 1561–1572. https://doi.org/10.1016/0277-9536(94)00273-V

Ellison, C.G., Deangelis, R.T., Hill, T.D., Froese, P., 2019. Sleep Quality and the Stress-Buffering Role of Religious Involvement: A Mediated Moderation Analysis. Journal for the Scientific Study of Religion 58, 251–268. https://doi.org/10.1111/jssr.12581

Ellison, C.G., George, L.K., 1994. Religious Involvement, Social Ties, and Social Support in a Southeastern Community. Journal for the Scientific Study of Religion 33, 46–61. https://doi.org/10.2307/1386636

Ellison, C.G., Hummer, R., Burdette, A., Benjamins, M., 2010. Race, Religious Involvement and Health: The Case of African Americans, in: Ellison, C.G., Hummer, R.A. (Eds.), Religion, Families and Health: Population-Based Research in the United States. pp. 321–48.

Ellison, C.G., Levin, J.S., 1998. The Religion-Health Connection: Evidence, Theory, and Future Directions. Health Education & Behavior 25, 700–720. https://doi.org/10.1177/109019819802500603

Ellison, C.G., Musick, M.A., Henderson, A.K., 2008. Balm in Gilead: Racism, Religious Involvement, and Psychological Distress Among African-American Adults. Journal for the Scientific Study of Religion 47, 291–309. https://doi.org/10.1111/j.1468-5906.2008.00408.x

Ellison, C.G., Walker, A.B., Glenn, N.D., Marquardt, E., 2011. The Effects of Parental Marital Discord and Divorce on the Religious and Spiritual Lives of Young Adults. Social Science Research 40, 538–551. https://doi.org/10.1016/j.ssresearch.2010.10.010

Felitti, V.J., Anda, R.F., Nordenberg, D., Williamson, D.F., Spitz, A.M., Edwards, V., Koss, M.P., Marks, J.S., 1998. Relationship of Childhood Abuse and Household Dysfunction to Many

of the Leading Causes of Death in Adults: The Adverse Childhood Experiences (ACE) Study. American Journal of Preventive Medicine 14, 245–258. https://doi.org/10.1016/S0749-3797(98)00017-8

Ferraro, K.F., Kelley-Moore, J.A., 2003. Cumulative Disadvantage and Health: Long-Term Consequences of Obesity? American Sociological Review 68, 707–729. https://doi.org/10.2307/1519759

Ferraro, K.F., Kim, S., 2014. Health benefits of religion among Black and White older adults? Race, religiosity, and C-reactive protein. Social Science & Medicine 120, 92–99. https://doi.org/10.1016/j.socscimed.2014.08.030

Ferraro, K.F., Koch, J.R., 1994. Religion and Health among Black and White Adults: Examining Social Support and Consolation. Journal for the Scientific Study of Religion 33, 362–375. https://doi.org/10.2307/1386495

Ferraro, K.F., Shippee, T.P., 2009. Aging and Cumulative Inequality: How Does Inequality Get Under the Skin? The Gerontologist 49, 333–343. https://doi.org/10.1093/geront/gnp034

Gelaye, B., Kajeepeta, S., Zhong, Q.-Y., Borba, C.P.C., Rondon, M.B., Sánchez, S.E., Henderson, D.C., Williams, M.A., 2015. Childhood abuse is associated with stress-related sleep disturbance and poor sleep quality in pregnancy. Sleep Medicine 16, 1274–1280. https://doi.org/10.1016/j.sleep.2015.07.004

George, L.K., Ellison, C.G., Larson, D.B., 2002. Explaining the Relationships Between Religious Involvement and Health. Psychological Inquiry 13, 190–200. https://doi.org/10.1207/S15327965PLI1303_04

George, L.K., Larsons, D.B., Koeing, H.G., McCullough, M.E., 2000. Spirituality and health: What we know, what we need to know. Journal of Social and Clinical Psychology; New York 19, 102–116. https://doi.org/http://dx.doi.org/10.1521/jscp.2000.19.1.102

Germain, A., Buysse, D.J., Nofzinger, E., 2008. Sleep-specific Mechanisms Underlying Posttraumatic Stress Disorder: Integrative Review and Neurobiological Hypotheses. Sleep medicine reviews 12, 185–195. https://doi.org/10.1016/j.smrv.2007.09.003

Gonnerman, M.E., Lutz, G.M., Yehieli, M., Meisinger, B.K., 2008. Religion and Health Connection: A Study of African American, Protestant Christians. Journal of Health Care for the Poor and Underserved 19, 193–199. https://doi.org/10.1353/hpu.2008.0020

Grandner, M.A., Williams, N.J., Knutson, K.L., Roberts, D., Jean-Louis, G., 2016. Sleep disparity, race/ethnicity, and socioeconomic position. Sleep Medicine, NHLBI Workshop on Reducing Health Disparities: The Role of Sleep Deficiency and Sleep Disorders 18, 7–18. https://doi.org/10.1016/j.sleep.2015.01.020

Greenfield, E.A., 2010. Child abuse as a life-course social determinant of adult health. Maturitas 66, 51–55. https://doi.org/10.1016/j.maturitas.2010.02.002

Greenfield, E.A., Lee, C., Friedman, E.L., Springer, K.W., 2011. Childhood Abuse as a Risk Factor for Sleep Problems in Adulthood: Evidence from a U.S. National Study. Annals of Behavioral Medicine 42, 245–256. https://doi.org/10.1007/s12160-011-9285-x

Greenfield, E.A., Marks, N.F., 2010. Identifying experiences of physical and psychological violence in childhood that jeopardize mental health in adulthood. Child Abuse & Neglect 34, 161–171. https://doi.org/10.1016/j.chiabu.2009.08.012

Greenfield, E.A., Marks, N.F., 2009. Profiles of Physical and Psychological Violence in Childhood as a Risk Factor for Poorer Adult Health: Evidence From the 1995-2005 National Survey of Midlife in the United States. Journal of Aging and Health 21, 943–966. https://doi.org/10.1177/0898264309343905

Gregory, A.M., Caspi, A., Moffitt, T.E., Poulton, R., 2006. Family Conflict in Childhood: A Predictor of Later Insomnia. Sleep 29, 1063–1067. https://doi.org/10.1093/sleep/29.8.1063

Haas, S., Rohlfsen, L., 2010. Life course determinants of racial and ethnic disparities in functional health trajectories. Social Science & Medicine 70, 240–250. https://doi.org/10.1016/j.socscimed.2009.10.003

Hackney, C.H., Sanders, G.S., 2003. Religiosity and Mental Health: A MetaAnalysis of Recent Studies. Journal for the Scientific Study of Religion 42, 43–55. https://doi.org/10.1111/1468-5906.t01-1-00160

Hale, L., Do, D.P., 2007. Racial Differences in Self-Reports of Sleep Duration in a Population-Based Study. Sleep 30, 1096–1103. https://doi.org/10.1093/sleep/30.9.1096

Hall, M., Baum, A., Buysse, D.J., Prigerson, H.G., Kupfer, D.J., Reynolds, C.F., 1998. Sleep as a Mediator of the Stress-Immune Relationship. Psychosomatic Medicine 60, 48.

Harrison, M.O., Koenig, H.G., Hays, J.C., Eme-Akwari, A.G., Pargament, K.I., 2001. The epidemiology of religious coping: A review of recent literature. International Review of Psychiatry 13, 86–93. https://doi.org/10.1080/09540260124356

Hayward, M.D., Gorman, B.K., 2004. The long arm of childhood: The influence of early-life social conditions on men's mortality. Demography 41, 87–107. https://doi.org/10.1353/dem.2004.0005

Hayward, R.D., Krause, N., 2013. Changes in Church-Based Social Support Relationships During Older Adulthood. The Journals of Gerontology: Series B 68, 85–96. https://doi.org/10.1093/geronb/gbs100

Henderson, A.K., 2016. The Long Arm of Religion: Childhood Adversity, Religion, and Self-perception Among Black Americans. Journal for the Scientific Study of Religion 55, 324–348. https://doi.org/10.1111/jssr.12262

Henderson, W.M., Uecker, J.E., Stroope, S., 2016. The Role of Religion in Parenting Satisfaction and Parenting Stress Among Young Parents. The Sociological Quarterly 57, 675–710. https://doi.org/10.1111/tsq.12147

Hicken, M.T., Lee, H., Ailshire, J., Burgard, S.A., Williams, D.R., 2013. "Every Shut Eye, Ain't Sleep": The Role of Racism-Related Vigilance in Racial/Ethnic Disparities in Sleep Difficulty. Race and Social Problems 5, 100–112. https://doi.org/10.1007/s12552-013-9095-9

Hill, T.D., Burdette, A.M., Ellison, C.G., Musick, M.A., 2006. Religious attendance and the health behaviors of Texas adults. Preventive Medicine 42, 309–312. https://doi.org/10.1016/j.ypmed.2005.12.005

Hill, T.D., Deangelis, R., Ellison, C.G., 2018. Religious involvement as a social determinant of sleep: An initial review and conceptual model. Sleep Health 4, 325–330. https://doi.org/10.1016/j.sleh.2018.04.001

Hisler, G.C., Brenner, R.E., 2019. Does sleep partially mediate the effect of everyday discrimination on future mental and physical health? Social Science & Medicine 221, 115–123. https://doi.org/10.1016/j.socscimed.2018.12.002

Hughes, K., Bellis, M.A., Hardcastle, K.A., Sethi, D., Butchart, A., Mikton, C., Jones, L., Dunne, M.P., 2017. The effect of multiple adverse childhood experiences on health: A systematic review and meta-analysis. The Lancet Public Health 2, e356–e366. https://doi.org/10.1016/S2468-2667(17)30118-4

Irving, S.M., Ferraro, K.F., 2006. Reports of Abusive Experiences During Childhood and Adult Health Ratings: Personal Control as a Pathway? Journal of Aging and Health 18, 458–485. https://doi.org/10.1177/0898264305280994

Jung, J.H., 2018. Childhood Adversity, Religion, and Change in Adult Mental Health. Research on Aging 40, 155–179. https://doi.org/10.1177/0164027516686662

Kajeepeta, S., Gelaye, B., Jackson, C.L., Williams, M.A., 2015. Adverse childhood experiences are associated with adult sleep disorders: A systematic review. Sleep Medicine 16, 320–330. https://doi.org/10.1016/j.sleep.2014.12.013

Karatsoreos, I.N., McEwen, B.S., 2013. Annual Research Review: The neurobiology and physiology of resilience and adaptation across the life course. Journal of Child Psychology and Psychiatry 54, 337–347. https://doi.org/10.1111/jcpp.12054

Koenig, H.G., 2015. Religion, spirituality, and health: A review and update. Advances in mind-body medicine 29, 19–26.

Koenig, H.G., King, D.E., Carson, V.B., 2012. Handbook of religion and health. Oxford University Press, New York, NY.

Koskenvuo, K., Hublin, C., Partinen, M., Paunio, T., Koskenvuo, M., 2010. Childhood adversities and quality of sleep in adulthood: A population-based study of 26,000 Finns. Sleep Medicine 11, 17–22. https://doi.org/10.1016/j.sleep.2009.03.010

Krause, N., 2006a. Church-Based Social Support and Mortality. The Journals of Gerontology: Series B 61, S140–S146. https://doi.org/10.1093/geronb/61.3.S140

Krause, N., 2006b. Exploring the Stress-Buffering Effects of Church-Based and Secular Social Support on Self-Rated Health in Late Life. The Journals of Gerontology: Series B 61, S35–S43. https://doi.org/10.1093/geronb/61.1.S35

Krause, N., 2002a. Church-Based Social Support and Health in Old AgeExploring Variations by Race. The Journals of Gerontology: Series B 57, S332–S347. https://doi.org/10.1093/geronb/57.6.S332

Krause, N., 2002b. Exploring Race Differences in a Comprehensive Battery of Church-Based Social Support Measures. Review of Religious Research 44, 126–149. https://doi.org/10.2307/3512512

Krause, N., Ellison, C.G., Shaw, B.A., Marcum, J.P., Boardman, J.D., 2001. Church-Based Social Support and Religious Coping. Journal for the Scientific Study of Religion 40, 637–656. https://doi.org/10.1111/0021-8294.00082

Krause, N., Ironson, G., 2017. Is Involvement in Religion Associated with Better Sleep Quality? Pastoral Psychology 66, 595–608. https://doi.org/10.1007/s11089-017-0766-0

Krause, N., Van Tran, T., 1989. Stress and Religious Involvement Among Older Blacks. Journal of Gerontology 44, S4–S13. https://doi.org/10.1093/geronj/44.1.S4

Kuh, D., Ben-Shlomo, Y., Lynch, J., Hallqvist, J., Power, C., 2003. Life course epidemiology. Journal of Epidemiology and Community Health 57, 778–783. https://doi.org/10.1136/jech.57.10.778

Laposky, A.D., Van Cauter, E., Diez-Roux, A.V., 2016. Reducing health disparities: The role of sleep deficiency and sleep disorders. Sleep Medicine, NHLBI Workshop on Reducing Health Disparities: The Role of Sleep Deficiency and Sleep Disorders 18, 3–6. https://doi.org/10.1016/j.sleep.2015.01.007

Le, D., Holt, C.L., Hosack, D.P., Huang, J., Clark, E.M., 2016. Religious Participation is Associated with Increases in Religious Social Support in a National Longitudinal Study of African Americans. Journal of Religion and Health 55, 1449–1460. https://doi.org/10.1007/s10943-015-0143-1

Lee, J.K., Choi, J., Kim, C., Kim, Y., 2014. Social Media, Network Heterogeneity, and Opinion Polarization. Journal of Communication 64, 702–722. https://doi.org/10.1111/jcom.12077

Levin, J.S., Chatters, L.M., 1998. Research on religion and mental health: An overview of empirical findings and theoretical issues, in: Koenig, H.G. (Ed.), Handbook of Religion and Mental Health. Academic Press, San Diego, pp. 33–50.

Lincoln, C.E., Mamiya, L.H., 1990. The Black Church in the African American Experience. Duke University Press.

Liu, S.R., Kia-Keating, M., Nylund-Gibson, K., 2018. Patterns of adversity and pathways to health among White, Black, and Latinx youth. Child Abuse & Neglect 86, 89–99. https://doi.org/10.1016/j.chiabu.2018.09.007

Long, J.S., Freese, J., 2014. Regression Models for Categorical Dependent Variables Using Stata, Third Edition, 3 edition. ed. Stata Press, College Station, Texas.

Long, J.S., Mustillo, S.A., 2018. Using Predictions and Marginal Effects to Compare Groups in Regression Models for Binary Outcomes. Sociological Methods & Research 0049124118799374. https://doi.org/10.1177/0049124118799374

Mattis, J.S., Jagers, R.J., 2001. A relational framework for the study of religiosity and spirituality in the lives of African Americans. Journal of Community Psychology 29, 519–539. https://doi.org/10.1002/jcop.1034

Maynard-Reid, P.U., 2000. Diverse Worship: African-American, Caribbean and Hispanic Perspectives. InterVarsity Press.

Mays, V.M., Cochran, S.D., Barnes, N.W., 2007. Race, Race-Based Discrimination, and Health Outcomes Among African Americans. Annual Review of Psychology 58, 201–225. https://doi.org/10.1146/annurev.psych.57.102904.190212

Mc Elroy, S., Hevey, D., 2014. Relationship between adverse early experiences, stressors, psychosocial resources and wellbeing. Child Abuse & Neglect 38, 65–75. https://doi.org/10.1016/j.chiabu.2013.07.017

Mize, T.D., 2019. Best Practices for Estimating, Interpreting, and Presenting Nonlinear Interaction Effects. Sociological Science 6, 81–117. https://doi.org/10.15195/v6.a4

Morin, C.M., 1993. Insomnia: Psychological assessment and management. Guilford Press.

Mustillo, S.A., Lizardo, O.A., McVeigh, R.M., 2018. Editors' Comment: A Few Guidelines for Quantitative Submissions. American Sociological Review 83, 1281–1283. https://doi.org/10.1177/0003122418806282

Nurius, P.S., Green, S., Logan-Greene, P., Longhi, D., Song, C., 2016. Stress pathways to health inequalities: Embedding ACEs within social and behavioral contexts. International Public Health Journal; Hauppauge 8, 241–256.

Pargament, K.I., 2001. The psychology of religion and coping: Theory, research, practice. Guilford Press.

Pargament, K.I., Kennell, J., Hathaway, W., Grevengoed, N., Newman, J., Jones, W., 1988. Religion and the Problem-Solving Process: Three Styles of Coping. Journal for the Scientific Study of Religion 27, 90–104. https://doi.org/10.2307/1387404

Paris, P.J., 1985. The Social Teaching of the Black Churches. Fortress Press.

Pearlin, L.I., 1989. The Sociological Study of Stress. Journal of Health and Social Behavior 30, 241–256. https://doi.org/10.2307/2136956

Pew Research Center, 2015. U.S. Public Becoming Less Religious. Washington, D.C.

Pitzer, L.M., Fingerman, K.L., 2010. Psychosocial Resources and Associations Between Childhood Physical Abuse and Adult Well-being. The Journals of Gerontology: Series B 65B, 425–433. https://doi.org/10.1093/geronb/gbq031

Poon, C.Y.M., Knight, B.G., 2011. Impact of Childhood Parental Abuse and Neglect on Sleep Problems in Old Age. The Journals of Gerontology: Series B 66B, 307–310. https://doi.org/10.1093/geronb/gbr003

Powell, L.H., Shahabi, L., Thoresen, C.E., 2003. Religion and spirituality: Linkages to physical health. American Psychologist 58, 36–52. https://doi.org/10.1037/0003-066X.58.1.36

Ruiter, M.E., DeCoster, J., Jacobs, L., Lichstein, K.L., 2010. Sleep disorders in African Americans and Caucasian Americans: A meta-analysis. Behavioral Sleep Medicine 8, 246–259. https://doi.org/10.1080/15402002.2010.509251

Rutter, M., 1987. Psychosocial Resilience and Protective Mechanisms. American Journal of Orthopsychiatry 57, 316–331. https://doi.org/10.1111/j.1939-0025.1987.tb03541.x

Ryff, C., Almeida, D.M., Ayanian, J., Carr, D.S., Cleary, P.D., Coe, C., Davidson, R., Krueger, R.F., Lachman, M.E., Marks, N.F., Mroczek, D.K., Seeman, T., Seltzer, M.M., Singer, B.H., Sloan, R.P., Tun, P.A., Weinstein, M., Williams, D., 2017. Midlife in the United States (MIDUS 2), 2004-2006. https://doi.org/10.3886/ICPSR04652.v7

Ryff, C., Almeida, D.M., Ayanian, J., Carr, D.S., Cleary, P.D., Coe, C., Davidson, R., Krueger, R.F., Lachman, M.E., Marks, N.F., Mroczek, D.K., Seeman, T., Seltzer, M.M., Singer, B.H., Sloan, R.P., Tun, P.A., Weinstein, M., Williams, D., 2018. Midlife in the United States (MIDUS 2): Milwaukee African American Sample, 2005-2006. http://doi.org/10.3886/ICPSR22840.v5

Schieman, S., Bierman, A., Ellison, C.G., 2013. Religion and Mental Health, in: Aneshensel, C.S., Phelan, J.C., Bierman, A. (Eds.), Handbook of the Sociology of Mental Health, Handbooks of Sociology and Social Research. Springer Netherlands, Dordrecht, pp. 457–478. https://doi.org/10.1007/978-94-007-4276-5_22

Schnittker, J., 2019. Religion, social integration, and depression in Europe: Evidence from the European Social Survey. Social Science & Medicine 112376. https://doi.org/10.1016/j.socscimed.2019.112376

Shah, S., 2019. Does Religion Buffer the Effects of Discrimination on Distress for Religious Minorities? The Case of Arab Americans. Society and Mental Health 9, 171–191. https://doi.org/10.1177/2156869318799145

Shonkoff, J.P., Garner, A.S., The Committee on Psychosocial Aspects of Child and Family Health, C. on E.C., Siegel, B.S., Dobbins, M.I., Earls, M.F., Garner, A.S., McGuinn, L., Pascoe, J., Wood, D.L., 2012. The Lifelong Effects of Early Childhood Adversity and Toxic Stress. Pediatrics 129, e232–e246. https://doi.org/10.1542/peds.2011-2663

Slopen, N., Shonkoff, J.P., Albert, M.A., Yoshikawa, H., Jacobs, A., Stoltz, R., Williams, D.R., 2016. Racial Disparities in Child Adversity in the U.S. American Journal of Preventive Medicine 50, 47–56. https://doi.org/10.1016/j.amepre.2015.06.013

Sternthal, M.J., Slopen, N., Williams, D.R., 2011. RACIAL DISPARITIES IN HEALTH: How Much Does Stress Really Matter?1. Du Bois Review: Social Science Research on Race 8, 95–113. https://doi.org/10.1017/S1742058X11000087

Straus, M.A., 1979. Measuring Intrafamily Conflict and Violence: The Conflict Tactics (CT) Scales. Journal of Marriage and Family 41, 75–88. https://doi.org/10.2307/351733

Straus, M.A., Hamby, S.L., Boney-McKoy, S., Sugarman, D.B., 1996. The Revised Conflict Tactics Scales (CTS2): Development and Preliminary Psychometric Data. Journal of Family Issues 17, 283–316. https://doi.org/10.1177/019251396017003001

Strine, T.W., Chapman, D.P., 2005. Associations of frequent sleep insufficiency with health-related quality of life and health behaviors. Sleep Medicine 6, 23–27. https://doi.org/10.1016/j.sleep.2004.06.003

Taylor, M.C., Mateyka, P.J., 2011. Community Influences on White Racial Attitudes: What Matters and Why? The Sociological Quarterly 52, 220–243. https://doi.org/10.1111/j.1533-8525.2011.01202.x

Taylor, R.J., Chatters, L.M., Levin, J., 2004. Religion in the Lives of African Americans: Social, Psychological, and Health Perspectives. Sage Publications.

Taylor, R.J., Chatters, L.M., Lincoln, K.D., Woodward, A.T., 2017. Church-Based Exchanges of Informal Social Support Among African Americans. Race and Social Problems 9, 53–62. https://doi.org/10.1007/s12552-017-9195-z

Thuné-Boyle, I.C., Stygall, J.A., Keshtgar, M.R., Newman, S.P., 2006. Do religious/spiritual coping strategies affect illness adjustment in patients with cancer? A systematic review of the literature. Social Science & Medicine 63, 151–164. https://doi.org/10.1016/j.socscimed.2005.11.055

Turner, R.J., Thomas, C.S., Brown, T.H., 2016. Childhood adversity and adult health: Evaluating intervening mechanisms. Social Science & Medicine 156, 114–124. https://doi.org/10.1016/j.socscimed.2016.02.026

Umberson, D., Williams, K., Thomas, P.A., Liu, H., Thomeer, M.B., 2014. Race, Gender, and Chains of Disadvantage: Childhood Adversity, Social Relationships, and Health. Journal of Health and Social Behavior 55, 20–38. https://doi.org/10.1177/0022146514521426

Williams, D.R., Jackson, P.B., 2005. Social Sources Of Racial Disparities In Health. Health Affairs 24, 325–334. https://doi.org/10.1377/hlthaff.24.2.325

Williams, D.R., Sternthal, M., 2010. Understanding Racial-ethnic Disparities in Health: Sociological Contributions. Journal of Health and Social Behavior 51, S15–S27. https://doi.org/10.1177/0022146510383838

Wink, P., Dillon, M., Larsen, B., 2005. Religion as Moderator of the Depression-Health Connection: Findings From a Longitudinal Study. Research on Aging 27, 197–220. https://doi.org/10.1177/0164027504270483

Table 1. Descriptive statistics for all model variables, MIDUS (n = 1,767).

		Total (*n* = 1,767)		White (*n* = 1,404)		Black (*n* = 363)	
	Range	Mean	(SD)	Mean	(SD)	Mean	(SD)
Chronic Sleep Problems in Past 12 mos.	0-1	.121[a]	(.326)	.105	(.306)	.182 ***[b]	(.386)
Types of Abuse							
No Abuse		.588		.605		.521 **	
Some Abuse		.307		.301		.331	
All Abuse		.105		.093		.149 **	
Frequency of Religious Attendance	1-6	2.938	(1.506)	2.806	(1.475)	3.446***	(1.516)
Frequency of Private Prayer	1-6	4.636	(1.753)	4.489	(1.823)	5.207***	(1.306)
Religious Social Support Scale	1-4	2.367	(1.260)	2.287	(1.252)	2.676***	(1.246)
Religious Coping Scale	1-4	3.111	(.634)	3.053	(.633)	3.335***	(.585)
Woman		.557		.531		.656***	
Age	30-85	55.948	(12.349)	56.717	(12.405)	52.972***	(11.677)
Education Level							
Less than High School		.067		.050		.135***	
High School		.285		.271		.342**	
Some College		.293		.287		.317	
College Degree		.354		.392		.207***	
Currently Employed		.507		.496		.548	
Household Income (Logged)	0-12.612	10.253	(2.445)	10.455	(2.271)	9.470***	(2.902)
Parent		.882		.876		.904	
Marital Status							
Married		.623		.704		.311***	
Divorced/Separated		.186		.156		.303***	
Widowed		.084		.075		.121**	
Never Married		.106		.066		.264***	
Depression or Anxiety in Past 12 mos.	0-1	.184		.184		.185	
History of Heart Trouble		.194		.195		.187	

*p < .05. **p < .01. ***p < .001.

[a] Mean value for categorical variables is represents sample proportion.

[b] Significance tests indicate significant mean differences between White and Black respondents.

Table 2. Average marginal effects of religious involvement by level of childhood abuse and race on probability of having chronic sleep problems.

	White (*n* = 1404)		Black (*n* = 363)		Race Difference
	AME	SE	AME	SE	
Model 2: *Religious Attendance*[1]					
No Abuse	.008	(.008)	.016	(.019)	.008
Some Abuse	.001	(.011)	.002	(.023)	.001
All Abuse	.014	(.021)	–.067†	(.036)	–.081*
Model 3: *Private Prayer*[1]					
No Abuse	–.012	(.007)	–.005	(.020)	.007
Some Abuse	.010	(.008)	–.026	(.031)	–.036
All Abuse	–.002	(.016)	.005	(.045)	.007
Model 4: *Religious Social Support*[1]					
No Abuse	.003	(.009)	.032	(.021)	.030
Some Abuse	–.018	(.014)	–.030	(.028)	–.012
All Abuse	.025	(.029)	–.096*	(.045)	–.122*
Model 5: *Religious Coping*[1]					
No Abuse	–.015	(.019)	–.018	(.049)	–.003
Some Abuse	–.015	(.027)	–.094	(.071)	–.079
All Abuse	–.041	(.038)	–.094	(.084)	–.053

†p<.10, * p<.05, ** p<.01, *** p<.001

Average marginal effects; Standard errors in parentheses

[1] From adjusted logistic regression models that include all measures of religious involvement and all health and sociodemographic control variables.

Figure 1. Predicted probabilities of chronic sleep problems by accumulated childhood abuse and race from unadjusted logistic regression model.

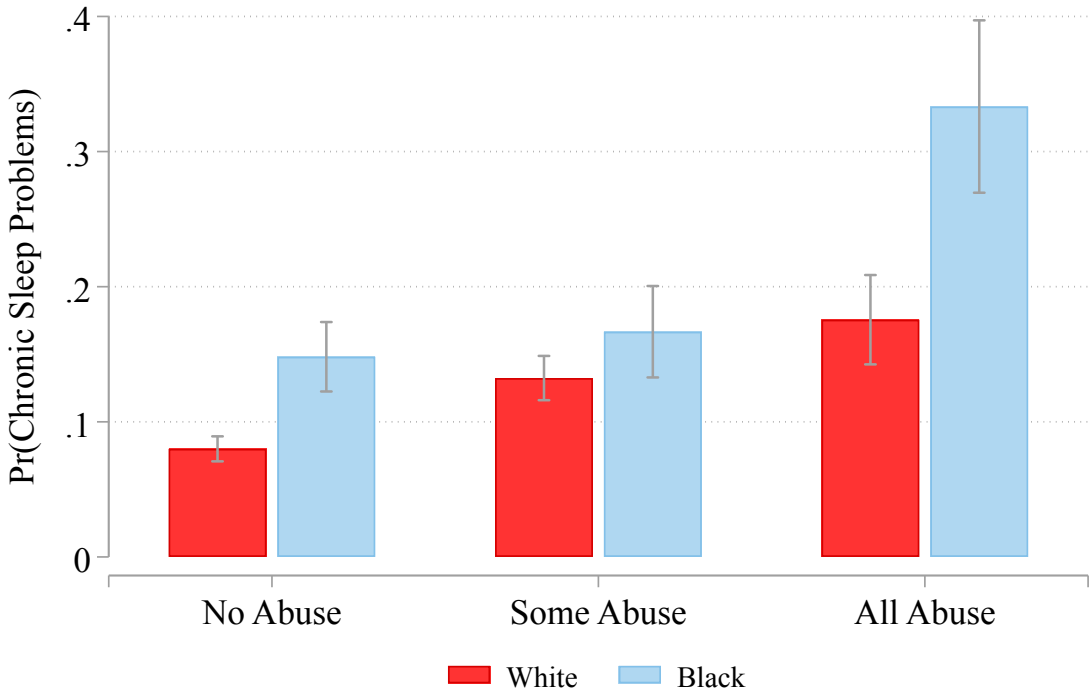


Figure 2. Predicted probabilities of chronic sleep problems by level of childhood abuse, frequency of religious attendance, and race: three-way interaction effect.

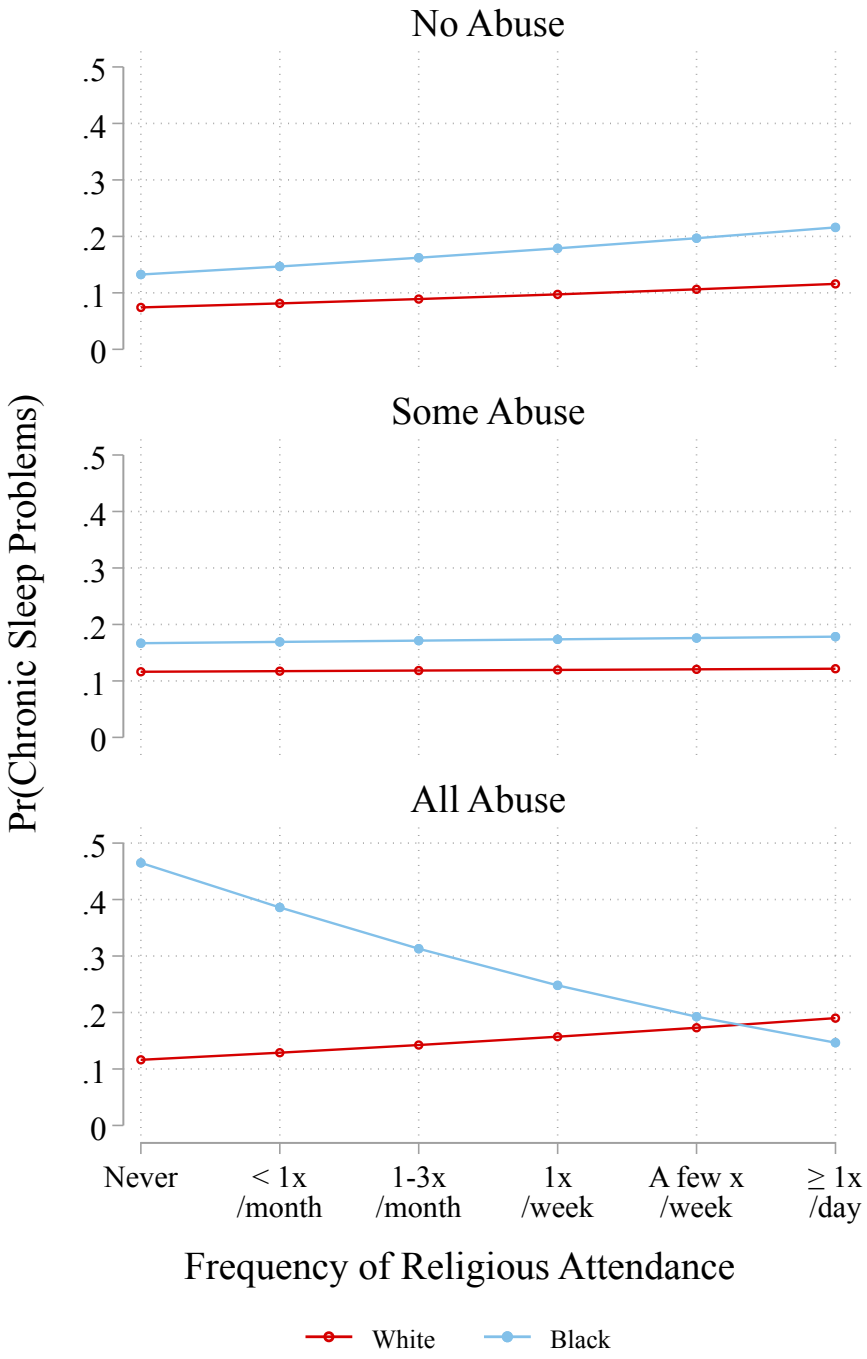
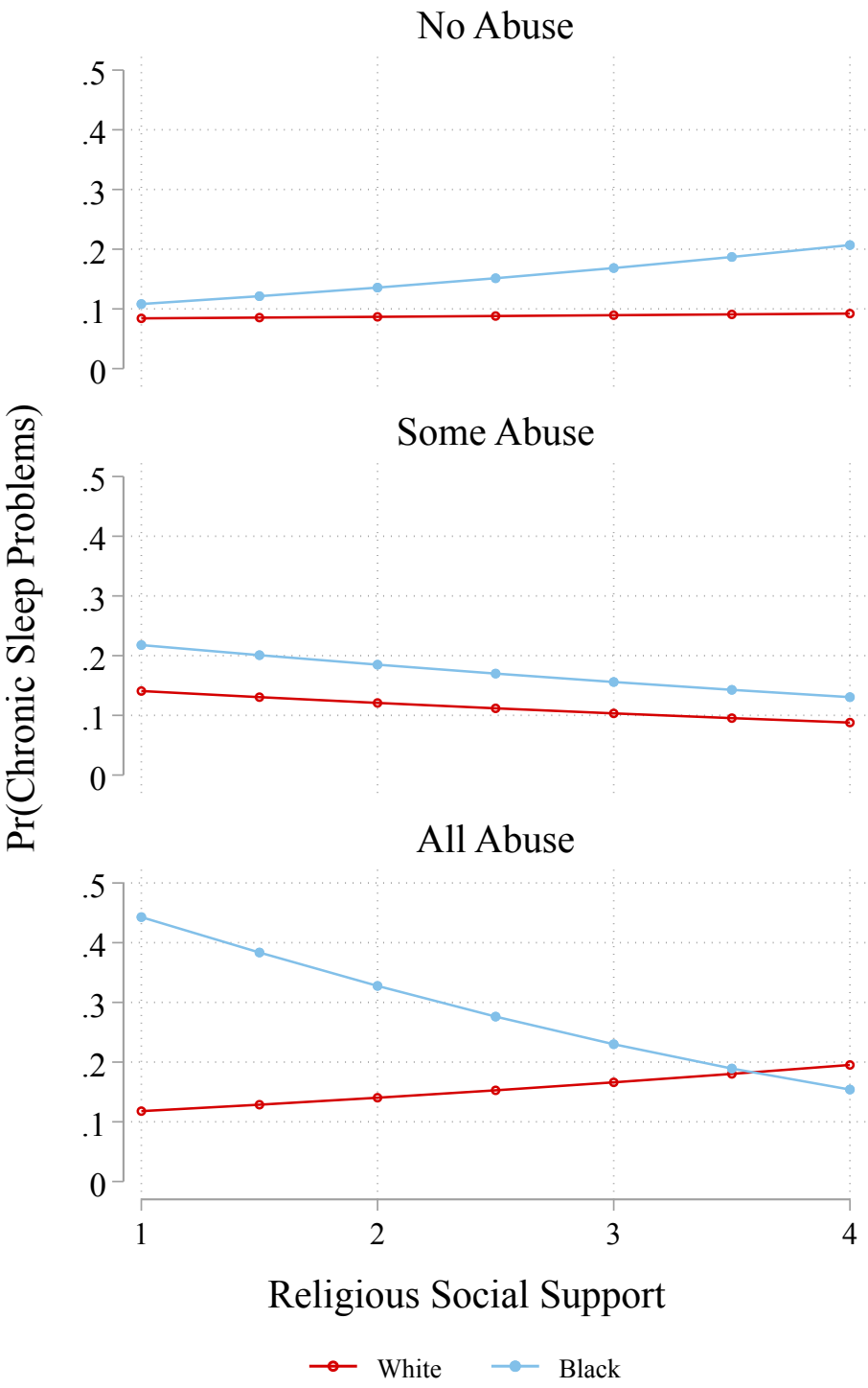


Figure 3. Predicted probabilities of chronic sleep problems by level of childhood abuse, level of religious social support, and race: three-way interaction effect.



Appendix 1. Odds ratios from logistic regression models predicting chronic sleep.

	(1)	(2)	(3)	(4)	(5)
Some Abuse	1.755**	1.865	.763	2.330*	1.25
	(.336)	(.779)	(.262)	(.950)	(1.231)
All Abuse	2.449***	1.663	1.269	1.244	2.949
	(.642)	(.984)	(.605)	(.729)	(3.616)
Black	2.000**	1.947	1.666	1.056	1.786
	(.481)	(.262)	(.715)	(.710)	(2.530)
Some Abuse × Black	.655	.806	1.768	1.755	5.116
	(.244)	(.774)	(1.233)	(1.627)	(11.459)
All Abuse × Black	1.174	6.755	1.599	14.526*	2.469
	(.517)	(7.142)	(1.277)	(15.552)	(5.525)
Religious Attendance		1.111	1.026	1.035	1.025
		(.123)	(.079)	(.080)	(.079)
Religious Support		.953	.959	1.036	.961
		(.085)	(.085)	(.126)	(.085)
Private Prayer		1.018	1.168	1.021	1.018
		(.066)	(.111)	(.067)	(.067)
Religious Coping		.745	.751	.736	.818
		(.126)	(.126)	(.125)	(.201)
Woman		1.318	1.292	1.331	1.321
		(.231)	(.227)	(.234)	(.232)
High school		.753	.766	.767	.801
		(.230)	(.236)	(.236)	(.246)
Some College		.977	.988	1.001	1.018
		(.293)	(.298)	(.303)	(.308)
College Degree		.836	.844	.823	.889
		(.261)	(.265)	(.258)	(.280)
Divorced/Separated		1.302	1.317	1.319	1.322
		(.267)	(.270)	(.271)	(.271)
Widowed		1.277	1.266	1.220	1.236
		(.374)	(.372)	(.359)	(.361)
Never Married		.693	.732	.702	.723
		(.219)	(.228)	(.221)	(.226)
Age		.996	.997	.997	.998
		(.008)	(.008)	(.008)	(.008)

Depression or Anxiety	3.749***	3.707***	3.709***	3.774***
	(.639)	(.631)	(.635)	(.643)
Heart Trouble	1.619**	1.611*	1.566*	1.591*
	(.302)	(.299)	(.293)	(.295)
Currently Employed	.672*	.689*	.659*	.678*
	(.120)	(.122)	(.117)	(.120)
Household Income (logged)	1.036	1.033	1.037	1.033
	(.037)	(.036)	(.037)	(.036)
Parent	.873	.961	.892	.898
	(.236)	(.262)	(.243)	(.243)
Some Abuse × Religious Attendance	.910			
	(.121)			
All Abuse × Religious Attendance	1.022			
	(.196)			
Black × Religious Attendance	1.025			
	(.178)			
Some Abuse × Black × Religious Attendance	.982			
	(.260)			
All Abuse × Black × Religious Attendance	.600			
	(.187)			
Some Abuse × Private Prayer		.771*		
		(.088)		
All Abuse × Private Prayer		.873		
		(.139)		
Black × Private Prayer		.892		
		(.156)		
Some Abuse × Black × Private Prayer		1.558		
		(.531)		
All Abuse × Black × Private Prayer		1.071		
		(.342)		
Some Abuse × Religious Support			.798	
			(.131)	
All Abuse × Religious Support			1.199	
			(.291)	
Black × Religious Support			1.274	
			(.271)	
Some Abuse × Black × Religious Support			.757	
			(.244)	

All Abuse × Black × Religious Support				.366* (.150)	
Some Abuse × Religious Coping					1.050 (.334)
All Abuse × Religious Coping					.837 (.337)
Black × Religious Coping					1.059 (.450)
Some Abuse × Black × Religious Coping					.552 (.372)
All Abuse × Black × Religious Coping					.834 (.585)
Constant	.087*** (.011)	.119* (.100)	.070** (.062)	.115* (.097)	.097* (.096)
Observations	1767	1767	1767	1767	1767
Pseudo R^2	.030	.113	.113	.117	.110

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Exponentiated coefficients (odds ratios); Standard errors in parentheses; Model 1 is the base model with interaction between childhood abuse and race. Models 2-5 include three-way interaction terms between childhood abuse, race, and each measure of religious involvement and all health and sociodemographic control variables.