The Role of Religious Involvement in Black–White Differences in Alcohol Use Disorders

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ABSTRACT. Objective: To date, a paradox in the social epidemiology of alcohol use disorders (AUDs) remains unresolved: non-Hispanic Blacks experience higher socioeconomic disadvantage, stressor exposures, and individual stress—prominent AUD risk factors, yet have lower than expected AUD risk compared with non-Hispanic Whites. Religious involvement is associated with lower AUD risk. Non-Hispanic Blacks are highly religiously involved. Together, those facts may account for Black–White differences in AUD risk. **Method:** We used Wave 2 of the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC) ($N = 26,784$) to examine whether (a) religious involvement accounts for Black–White differences in AUD risk, and (b) race moderates the association between religious involvement and AUD. Religious involvement indicators were service attendance, social interaction, and subjective religiosity and spirituality. Twelve-month AUD prevalence as defined by the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition*, was the outcome. Covariates were age, education,

income, marital status, and U.S.-born versus foreign-born nativity. **Results:** Blacks were significantly less likely than Whites to have an AUD (adjusted odds ratio [aOR] for men = 0.70, 95% CI [0.59, 0.83]; aOR for women = 0.71, 95% CI [0.57, 0.89]). An adjusted model with all three religious involvement indicators explained 17% of race differences among men (OR = 0.82) and 45% among women (OR = 1.03). There was no evidence that the association between religious involvement and AUD differed between Blacks and Whites. **Conclusions:** Religious service attendance, subjective religiosity, and spirituality account for a meaningful share of the Black–White differences in AUD. Future research is needed to conduct more fine-grained analyses of the aspects of religious involvement that are potentially protective against AUD, ideally differentiating between social norms associated with religious involvement, social support offered by religious participation, and deeply personal aspects of spirituality. (*J. Stud. Alcohol Drugs*, 77, 792–801, 2016)

ALCOHOL USE DISORDERS (AUDs) are characterized by harmful or compulsive alcohol consumption despite causing harm to oneself or others (Dawson, 2011; Peterson et al., 2003). AUD accounts for 4% of deaths and 4.5% of the global burden of disease (World Health Organization, 2011). Approximately 30% of all adults in the United States will have an AUD during their lifetime (Hasin et al., 2007). The effects of alcohol consumption comprise the third leading preventable cause of death in the United States, attributed to approximately 88,000 deaths annually (National Institute on Alcohol Abuse and Alcoholism, 2016). AUDs are also attributed to 3.5% of all cancer deaths (Nelson et al., 2013). AUD costs the economy more than \$200 million annually in lost productivity (Bouchery et al., 2011).

There are two features of the social epidemiology of AUD that are not well understood (i.e., and that researchers view as “paradoxes”) (Herd, 1994; Zapolski et al., 2014). The first paradox is that, despite experiencing greater socioeconomic

disadvantage, higher exposure to environmental stressors, and greater levels of individual stress (Boardman & Alexander, 2011; Roberts et al., 2011)—three prominent AUD risk factors (Pearlin & Radabaugh, 1976; Wilkinson & Marmot, 2003)—Blacks have lower 12-month and lifetime risks of AUD than Whites (Caetano et al., 2011; Grant et al., 2009; Hasin et al., 2007).

The second paradox is that, despite lower risks of AUD, the severity and health impact of AUD are worse for Blacks than for Whites (Caetano et al., 1998; Chartier & Caetano, 2010). For instance, in a clinical sample, the prevalence of hospital admissions for drinking and other outcomes among those with AUD was twice as high for Blacks as compared with Whites (Smothers et al., 2003). A recent population study found that at equivalent levels of alcohol consumption, Black men had higher mortality risk than White men (Jackson et al., 2015).

In this article, we investigate the first paradox—Black–White differences in experiencing an AUD during the preceding 12 months. Considering theory and evidence on racial inequalities in health broadly alongside the epidemiology of AUD among Blacks and Whites, we hypothesize the presence of race-specific protective factors for AUD. Religious involvement is one such protective factor (Levin, 1996), and AUD (Borders et al., 2010; Ghandour et al., 2009; Lambert et al., 2010) has been shown to be particularly salient among Blacks (Drevenstedt, 1998; Levin et al., 2005; Tabak & Mickelson, 2009). Whether religious involvement is a factor

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that can account for Black–White differences in AUD is not resolved.

Religious involvement and alcohol use disorders

The risk of alcohol and other drug abuse among religious people is 30%–40% less than among nonreligious people (Nelson, 2009). In a review of 86 studies that examined the association between levels of religious involvement and alcohol use and abuse, 76 studies (88%) reported significantly less alcohol abuse among religious persons (Koenig, 2001). Cultural systems of groups and societies shape the norms of alcohol consumption and the consequent likelihood of AUD through moral codes that govern patterns of alcohol consumption, the functions of alcohol consumption, who may consume alcohol, and what sanctions and consequences should be associated with alcohol consumption beyond the accepted norms (i.e., consumption that increases AUD) (Patrick, 1952). Religion is a cultural system/institution (Geertz, 2008; Hamilton, 1995) considered more influential than secular institutions on individuals' alcohol consumption behavior. This is because theology/doctrines are "ideas which become legitimated by being religiously attached and interpreted, so that they influence the world views of large groups of people" (Spika & Bridges, 1992, p. 22).

Religion is organized into beliefs, lifestyles, rituals, and symbols that can be understood through institutional and internalized dimensions. Religious service attendance and social interaction with other religious adherents are institutionalized dimensions of religious involvement (Levin et al., 1995). Frequently attending services is associated with a lower likelihood of AUD among individuals through greater access to social support networks that help individuals cope with stress (Chatters et al., 2008), which is a risk factor for AUD. Frequent attendance may also increase exposure to religious norms about alcohol consumption. Although alcohol consumption norms vary within religious institutions/traditions (e.g., Protestantism) (Belcher, 2006; Linsky, 1965), all traditions stigmatize alcohol use to the extent that it increases risk of AUD (McGrath, 2004; Miller, 1998). Religiosity could promote a culture of moderation with regard to alcohol consumption (Mechanic, 1990). Therefore, "even in faith groups that allow alcohol consumption, adherents are taught to be self-disciplined . . . —an orientation that discourages consumption of alcohol" (Clarke et al., 1990, p. 206) that may result in AUD. Social interaction can increase the network of individuals with whom one can engage in pro-social religious activities and healthy behaviors (Ellison & Levin, 1998).

Religious involvement that is individually experienced and subjectively interpreted characterizes the internalized dimension. Spirituality is one common indicator of this dimension (Levin & Preston, 1987). Spirituality is associated with a lower likelihood of AUD in ways that are different

from service attendance and social interaction. Because AUD is considered both a mental health disease and spiritual outcome (Nelson, 2009), individuals with high spirituality may have a lower likelihood of AUD through higher available spiritual and cognitive resources (Hathaway & Pargament, 1991; Pargament, 1990) to cope with and regulate emotions that arise from dealing with stressful situations (Nelson, 2009).

The role of religious involvement in race differences in alcohol use disorder

Variations in the levels of religious involvement and potential differences in strength of protection provided by religious involvement between Blacks and Whites may account for racial differences in AUD risk. First, Blacks have higher levels of religious involvement than Whites (Taylor et al., 1996), with the elderly and women often having the highest levels (Taylor et al., 1996; Thomas et al., 1994). Therefore, with all else equal, Blacks may have a lower likelihood of AUD simply because they are more religiously involved than Whites (Taylor et al., 2003). This reasoning has been called the "differential involvement perspective" (Krause, 2002). Our first hypothesis is that race differences in religious involvement account for Black–White differences in AUD. The differential impact perspective posits that the gains of religion on health vary across racial groups (Krause, 2005). Religious involvement has been central to preserving the cultural identity among Blacks in America and an organizing feature of their lives during key historical periods such as slavery and the Civil Rights Movement (Fallin, 2007; Lincoln & Mamiya, 1990). Religious involvement has consistently remained salient for Blacks beyond the Civil Rights era (Brown et al., 2015). Our second hypothesis, therefore, is that Black–White differences in AUD are attributable in part to the greater protective effect of religious involvement on AUD among Blacks than Whites.

The current study investigates the role of religious involvement in elucidating Blacks' lower odds of 12-month AUD relative to Whites. This work extends the efforts of prior studies by examining, through two theoretical perspectives, the extent to which multiple dimensions of religious involvement attenuate Black–White differences among a population-based sample.

Method

Sample

Data were from Wave 2 of the National Epidemiologic Survey on Alcohol and Related Conditions (NESARC), conducted in 2004–2005. NESARC is a population-based survey that captured health outcomes, behavioral factors, and psychiatric disorders among civilian non-institutionalized adults

in the United States (National Institute on Alcohol Abuse and Alcoholism, 2010). NESARC oversampled non-Hispanic blacks, Hispanics, and persons ages 18–24 years. Further details of sampling methodology and institutional review board approval are published (Grant & Dawson, 2006; Grant et al., 2009). Wave 2 consisted of 34,653 interviews with a response rate of 87%. The current sample was restricted to Black and White respondents only ($n = 26,784$). Study protocols for analysis with NESARC were also reviewed by Harvard (IRB15-0099) and determined nonhuman subjects research.

Measures

Alcohol use disorders. AUDs were defined as the 12-month prevalence of alcohol abuse and/or dependence according to the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition* (DSM-IV; American Psychiatric Association, 1994). AUDs were measured by the Alcohol Use Disorder and Associated Disabilities Interview Schedule–DSM-IV (AUDADIS-IV). Test–retest reliability ranges for AUD using the AUDADIS are high ($k = .76$, $SE = .05$) (Grant et al., 1995; Hasin et al., 1997).

Religious involvement. We used NESARC's four religious involvement questions to derive three measures: religious service attendance, social interaction, and subjective religiosity and spirituality. Religious service attendance was ascertained with two questions. One question asked respondents whether they currently attend religious services at a church, mosque, synagogue, or other religious place. Responses were yes or no. The other question asked about frequency of service attendance. Responses ranged from 1 (*once a year*) to 5 (*twice a week or more*). Because frequency of service attendance is only recorded among those who attend services, we derived a new variable by adding another category: 0 (*do not attend*), 1 (*once a year/a few times a year*) (collapsed because of small cell size in *once a year*), 2 (*one to three times a month*), 3 (*once a week*), and 4 (*twice a week or more*). Social interaction corresponded to the question, "How many members of your religious group do you see or talk to socially every 2 weeks?" We recoded it into four equal groups that resulted in the following categories: 1 (≤ 8 members), 2 (9–16 members), 3 (17–24 members), and 4 (≥ 25 members). Subjective religiosity and spirituality was ascertained from the question, "How important is religious or spiritual beliefs in your daily life?" Responses ranged from 0 (*not at all important*) to 3 (*very important*) and were reverse coded to match the direction of religious service attendance.

Covariates

We included as controls in our analyses age (in years), educational attainment (0 [*less than high school*], 1 [*completed high school*], and 2 [*some college or higher*]), and

personal income (0 [$\$0$ – $\$19,999$], 1 [$\$20,000$ – $\$34,999$], and 2 [$\$35,000$ and higher]). We also included marital status (coded 0 [*married and cohabitating*], 1 [*widowed, separated, and divorced*], and 2 [*never married*]) and nativity (coded 0 [*U.S. born*] vs. 1 [*foreign born*]). To examine the specificity of the religious involvement association on AUD, we conducted supplementary analyses by additionally controlling for mood and anxiety disorders, substance use disorders, and nicotine dependence in the past year. These disorders are associated with both AUD and race, and may also influence or be influenced by religious participation (Chatters et al., 2008; Falk et al., 2006; Hasin et al., 2007; Huang et al., 2006).

Analytic strategy

Given gender (Maselko & Kubzansky, 2006) and racial differences in religious involvement (Levin et al., 1994) and gender differences in AUD (Wagner et al., 2002), all analyses were conducted separately for men and women. We conducted bivariate statistics for Black men ($n = 2,326$) and women ($n = 4,261$) and White men ($n = 8,853$) and women ($n = 11,308$). Unweighted sample sizes are reported with weighted percentages for categorical variables, and weighted means and standard errors are reported for continuous variables.

To examine the first hypothesis, we used multivariable logistic regression to estimate the risk of AUD for Blacks relative to Whites, adjusting for age, education, income, marital status, and nativity (Model 1). We then sequentially adjusted for service attendance, social interaction, and subjective religiosity and spirituality (Models 2–4). Next, we adjusted for all three religion variables simultaneously (Model 5). We examined how well each religious involvement model fit the data using goodness of fit (Archer et al., 2007).

Our second hypothesis is that the protective association between religious involvement and AUD is stronger for Blacks than for Whites. We derived race-specific estimates of the association between each religious involvement indicator and AUD as well as the three indicators simultaneously. Then, we tested for differences on the odds ratio (OR) scale between Blacks and Whites using the Adjusted Wald Test and confirmed the results by performing interaction contrasts (Schwartz, 2006) of race differences on the probability scale (i.e., margins) in pooled data.

Because NESARC is weighted to adjust for nonresponse at the household and individual levels, selection of one person per household, and oversampling of the demographic subgroups, all analyses were weighted and performed in STATA 13.1 (StataCorp LP, College Station, TX) using the suite of "svy" and "subpop" survey commands. These procedures account for the complex survey design of NESARC and obtain correct standard errors when analyzing subgroups within a larger survey (Heeringa et al., 2010).

TABLE 1. Sample characteristics by race and gender

Variable	Black men (<i>n</i> = 2,326)	Black women (<i>n</i> = 4,261)	White men (<i>n</i> = 8,853)	White women (<i>n</i> = 11,308)
DSM-IV alcohol use disorder, yes, <i>n</i> (%)	276 (13.16)	213 (05.44)	1,357 (15.09)	655 (05.63)
Religious involvement				
Religious service attendance, range (0–5), <i>M</i> (<i>SE</i>)	1.56 (0.05)	2.08 (0.05)	1.21 (0.02)	1.48 (0.02)
Do not attend, <i>n</i> (%)	851 (38.29)	1,030 (25.15)	4,848 (53.19)	5,171 (44.91)
Once a year/a few times a year, <i>n</i> (%)	286 (12.56)	354 (07.86)	641 (07.36)	780 (06.74)
One to three times a month, <i>n</i> (%)	413 (16.81)	885 (21.14)	1,027 (11.90)	1,520 (13.91)
Once a week, <i>n</i> (%)	449 (18.70)	1,049 (25.42)	1,662 (19.63)	2,746 (24.63)
Twice a week or more, <i>n</i> (%)	319 (13.64)	993 (21.02)	654 (07.93)	1,056 (09.81)
Social interaction, IQR ^a (1–10), <i>M</i> (<i>SE</i>)	8.05 (0.48)	7.0 (0.29)	9.85 (0.37)	7.35 (0.21)
≤8 members, <i>n</i> (%)	1,092 (75.75)	2,493 (77.63)	2,751 (68.75)	4,535 (74.22)
9–16 members, <i>n</i> (%)	195 (12.48)	432 (17.78)	636 (16.65)	863 (14.70)
17–24 members, <i>n</i> (%)	58 (04.19)	110 (03.37)	198 (05.05)	276 (04.59)
≥25 members, <i>n</i> (%)	107 (06.58)	176 (05.23)	363 (09.55)	369 (06.49)
Subjective religiosity and spirituality, range (1–4), <i>M</i> (<i>SE</i>)	3.67 (0.02)	3.80 (0.01)	3.15 (0.02)	3.48 (0.01)
Not important at all, <i>n</i> (%)	43 (01.86)	34 (00.92)	746 (07.17)	409 (03.40)
Not very important, <i>n</i> (%)	69 (03.24)	54 (01.60)	1,178 (12.95)	757 (06.57)
Somewhat important, <i>n</i> (%)	486 (21.15)	545 (13.59)	3,118 (35.39)	3,261 (28.95)
Very important, <i>n</i> (%)	1,715 (73.75)	3,618 (83.89)	3,772 (43.95)	6,831 (61.08)
Socioeconomic status				
Education, <i>n</i> (%)				
Less than high school	479 (19.16)	779 (16.40)	877 (09.82)	1,181 (10.29)
Completed high school	711 (31.09)	1,266 (29.34)	2,382 (27.67)	3,197 (28.71)
Some college or higher	1,136 (49.75)	2,216 (54.25)	5,594 (62.51)	6,930 (61.01)
Personal income, <i>n</i> (%)				
\$0–\$19,999	922 (39.74)	2,315 (53.85)	2,172 (24.21)	5,841 (53.71)
\$20,000–\$34,999	587 (25.95)	1,057 (26.01)	2,047 (23.31)	2,531 (21.71)
≥\$35,000	817 (34.31)	889 (20.13)	4,634 (52.48)	2,936 (24.58)
Covariates				
Age, <i>M</i> (<i>SE</i>)	44.64 (0.43)	46.03 (0.32)	49.01 (0.22)	50.73 (0.23)
Marital status, <i>n</i> (%)				
Married/cohabiting	1,108 (51.89)	1,268 (35.82)	5,535 (69.45)	6,221 (63.87)
Widowed/separated/divorced	563 (17.04)	1,677 (31.94)	1,657 (13.13)	3,653 (24.37)
Never married	655 (31.07)	1,316 (32.24)	1,661 (17.43)	1,434 (11.85)
Nativity, <i>n</i> (%)				
Born outside the United States	197 (10.07)	306 (09.52)	376 (04.07)	539 (04.63)

Notes: DSM-IV = *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition*. ^aInterquartile range (IQR) among the sample; *n* = unweighted sample size with weighted column %.

Results

Demographic characteristics of the sample, 12-month prevalence of AUD, and levels of religious involvement are presented in Table 1. Within gender, Blacks had lower prevalence of 12-month AUD than Whites. Black women had the highest proportion of attending services twice or more weekly (21%), followed by Black men (13.6%), White women (9.8%), and White men (7.9%). White men had the highest number of other religious members they interacted with socially (9.9), followed by Black men (8.1) (interquartile range: 1–10) (Table 1). Whites on average were older and had a higher proportion of persons who were married, who had incomes \$35,000 and greater, and who had completed college than did Blacks.

Table 2 presents the results of the analyses evaluating Hypothesis 1 among men, specifically that religious involvement would account for Black–White differences in AUD. First, the odds of AUD were 30% lower among Black

compared with White men (adjusted odds ratio [aOR] = 0.70, 95% CI [0.59, 0.83]) adjusted for covariates (Model 1). Attending services twice a week or more relative to not attending (aOR = 0.27, 95% CI [0.17, 0.39], Model 2), socially interacting with 25 or more members relative to 8 and fewer (aOR = 0.55, 95% CI [0.35, 0.85], Model 3), and subjective religiosity and spirituality (aOR = 0.78, 95% CI [0.73, 0.84], Model 4) were associated with lower odds of 12-month AUD. Independently, each religious involvement indicator partially attenuated Black–White differences in odds of 12-month AUD. Simultaneous adjustment for all three indicators brought the adjusted OR for Black–White differences in AUD to 0.82 (95% CI [0.62, 1.07], Model 5). That model accounted for 17% of race differences in Model 1 (i.e., [aOR = {0.70 – 0.82} / 0.70] × 100).

In the supplemental analyses among men, race differences in AUD remained after adjusting for mood, anxiety, substance use disorders, and nicotine dependence in the past 12 months (Supplemental Table S1) (aOR = 0.75, CI

TABLE 2. Multivariable analyses of religious involvement and Black–White differences in DSM-IV alcohol use disorders, men

Variable	Model 1 aOR [95% CI]	Model 2 aOR [95% CI]	Model 3 aOR [95% CI]	Model 4 aOR [95% CI]	Model 5 ^d aOR [95% CI]
Race					
Black ^a	0.70*** [0.59, 0.83]	0.77*** [0.65, 0.92]	0.72* [0.55, 0.94]	0.82* [0.68, 0.98]	0.82 [0.62, 1.07]
Religious involvement					
Service attendance ^b		0.27*** [0.17, 0.39]			0.40** [0.24, 0.68]
Social interaction ^c			0.55** [0.35, 0.85]		0.91 [0.55, 1.49]
Subjective religiosity and spirituality				0.78*** [0.73, 0.84]	0.68*** [0.57, 0.82]
Covariates					
Age	0.96*** [0.96, 0.97]	0.96*** [0.96, 0.97]	0.96*** [0.95, 0.97]	0.96*** [0.96, 0.97]	0.96*** [0.96, 0.97]
Education	0.92 [0.84, 1.01]	0.93 [0.86, 1.01]	0.94 [0.81, 1.09]	0.92 [0.84, 1.01]	0.94 [0.81, 1.09]
Income	1.07* [1.01, 1.14]	1.09* [1.02, 1.17]	1.13* [1.00, 1.28]	1.07* [1.00, 1.14]	1.09 [0.96, 1.23]
Never married ^e	1.51*** [1.27, 1.80]	1.37*** [1.15, 1.63]	1.46** [1.10, 1.95]	1.41*** [1.18, 1.68]	1.39* [1.03, 1.86]
Born outside the United States	0.60* [0.40, 0.90]	0.61* [0.40, 0.92]	0.54 [0.28, 1.02]	0.58* [0.38, 0.88]	0.53 [0.27, 1.03]
Goodness of fit	$F(9, 57) = 35.46$, $p < .0001$	$F(9, 57) = 31.48$, $p < .0001$	$F(9, 57) = 20.36$, $p < .0001$	$F(9, 57) = 31.28$, $p < .0001$	$F(9, 57) = 20.16$, $p < .0001$

Notes: DSM-IV = *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition*. ^aReference group is non-Hispanic White; ^bthe odds of attending services “twice per week” compared with the odds of “do not attend” (reference group); ^cthe odds of “≥25 members” compared with the odds of “≤8 members”(reference group); ^din analyses with multiple religion variables, the reference group for service attendance is “once/twice per year” because the sample for the other religious variables becomes limited to people who currently attend religious services; ^ereference group is married. aOR = adjusted odds ratio; CI = confidence interval.

* $p < .05$; ** $p < .01$; *** $p < .001$.

[0.63, 0.89]). (Supplemental Tables S1 and S2 are presented as compendiums to this article online.) These differences in AUD were attenuated after we adjusted for religious involvement: adjustment for all measures of religious involvement accounted for 14% of race differences in AUD (vs. 17% in the primary analyses).

Table 3 shows the results among women. Blacks had 0.71 lower odds of AUD than Whites (95% CI [0.57, 0.89], Model 1). Religious service attendance (aOR = 0.27, 95% CI [0.16, 0.44], Model 2), social interaction (aOR = 0.22, 95% CI [0.10, 0.50], Model 3), and subjective religiosity and spirituality (aOR = 0.78, 95% CI [0.72, 0.85], Model

4) were associated with lower odds of 12-month AUD. Adjustment for any of the religious involvement indicators in Models 2–4 attenuated the OR for race. In Model 5, including all measures of religious involvement accounted for 45% of race differences (i.e., [aOR = {0.71 – 1.03} / 0.71] × 100).

In the supplemental analyses adjusting for psychiatric and substance disorders (Supplemental Table S2), race differences in AUD among women were not quite statistically significant before introducing religious involvement into the analyses (aOR = 0.82, 95% CI [0.66, 1.02], Model 1). However, the OR for Black–White differences in the supple-

TABLE 3. Multivariable analyses of religious involvement and Black–White differences in DSM-IV alcohol use disorders, women

Variable	Model 1 aOR [95% CI]	Model 2 aOR [95% CI]	Model 3 aOR [95% CI]	Model 4 aOR [95% CI]	Model 5 ^d aOR [95% CI]
Race					
Black ^a	0.71** [0.57, 0.89]	0.86 [0.69, 1.09]	0.91 [0.68, 1.22]	0.80 [0.64, 1.00]	1.03 [0.75, 1.40]
Religious involvement					
Service attendance ^b		0.27*** [0.16, 0.44]			0.39** [0.21, 0.71]
Social interaction ^c			0.22*** [0.10, 0.50]		0.31* [0.13, 0.75]
Subjective religiosity and spirituality				0.78** [0.72, 0.85]	0.76 [0.57, 1.01]
Covariates					
Age	0.95*** [0.94, 0.95]	0.95*** [0.94, 0.96]	0.95*** [0.94, 0.96]	0.95 [0.99, 1.17]	0.96*** [0.94, 0.96]
Education	1.22* [1.04, 1.43]	1.20*** [1.05, 1.35]	1.07 [0.85, 1.33]	1.22* [1.04, 1.43]	1.05 [0.85, 1.31]
Income	1.09* [1.05, 1.43]	1.07 [0.98, 1.18]	1.16* [1.01, 1.33]	1.08** [1.04, 1.23]	1.13 [0.98, 1.30]
Never married ^e	1.71*** [1.38, 2.13]	1.56*** [1.25, 1.94]	1.26 [0.88, 1.80]	1.65*** [1.33, 2.04]	1.12 [0.95, 1.33]
Born outside the United States	0.45** [0.28, 0.71]	0.42** [0.26, 0.67]	0.35* [0.15, 0.85]	0.43** [0.27, 0.68]	0.32* [0.13, 0.79]
Goodness of fit	$F(9, 57) = 26.12$, $p < .0001$	$F(9, 57) = 25.16$, $p < .0001$	$F(9, 57) = 11.53$, $p < .0001$	$F(9, 57) = 23.76$, $p < .0001$	$F(9, 57) = 10.26$, $p < .0001$

Notes: DSM-IV = *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition*. ^aReference group is non-Hispanic White; ^bthe odds of attending services “twice per week” compared with the odds of “do not attend” (reference group); ^cthe odds of “≥25 members” compared with the odds of “≤8 members”(reference group); ^din analyses with multiple religion variables, the reference group for service attendance is “once/twice per year” because the sample for the other religious variables becomes limited to people who currently attend religious services; ^ereference group is married. aOR = adjusted odds ratio; CI = confidence interval.

* $p < .05$; ** $p < .01$; *** $p < .001$.

TABLE 4. Association between religious involvement and DSM-IV alcohol use disorders by race and gender

Variable	Model 1 aOR [95% CI]	Model 2 aOR [95% CI]	Model 3 aOR [95% CI]	Model 4 ^c aOR [95% CI]
Black men				
Religious involvement				
Religious service attendance ^a	0.27** [0.13, 0.58]			0.46 [0.19, 1.12]
Social interaction ^b		0.30 [†] [0.88, 1.04]		0.45 [0.12, 1.68]
Subjective religiosity and spirituality			0.85 [0.68, 1.05]	0.84 [0.50, 1.39]
White men				
Religious involvement				
Religious service attendance ^a	0.25*** [0.16, 0.40]			0.39** [0.22, 0.70]
Social interaction ^b		0.59* [0.36, 0.95]		0.97 [0.55, 1.67]
Subjective religiosity and spirituality			0.78*** [0.73, 0.84]	0.67*** [0.56, 0.81]
Interaction (Race × Religious Involvement)	$F(1, 65) = 0.03$, $p = .86$	$F(1, 65) = 0.90$, $p = .34$	$F(1, 65) = 0.50$, $p = .48$	
Black women				
Religious involvement				
Religious service attendance ^a	0.26*** [0.15, 0.45]			0.45* [0.22, 0.93]
Social interaction ^b		0.42 [0.09, 1.83]		0.61 [0.15, 2.52]
Subjective religiosity and spirituality			0.73* [0.58, 0.94]	0.72 [0.35, 1.48]
White women				
Religious involvement				
Religious service attendance ^a	0.28*** [0.15, 0.51]			0.39* [0.18, 0.83]
Social interaction ^b		0.18** [0.07, 0.50]		0.25* [0.08, 0.78]
Subjective religiosity and spirituality			0.79*** [0.72, 0.87]	0.79 [0.57, 1.08]
Interaction (Race × Religious Involvement)	$F(1, 65) = 0.04$, $p = .83$	$F(1, 65) = 0.80$, $p = .37$	$F(1, 65) = 0.33$, $p = .56$	

Notes: Models were estimated separately for race and gender, adjusted for covariates education, income, age, marital status, and nativity. DSM-IV = *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition*; aOR = adjusted odds ratio; CI = confidence interval. ^aThe odds of attending services “twice per week” compared with the odds of “do not attend” (reference group); ^bthe odds of “≥25 members” compared with the odds of “≤8 members”(reference group); ^cin analyses with multiple religion variables, the reference group for service attendance is “once/twice per year” because the sample for the other religious variables becomes limited to people who currently attend religious services.

[†] $p < .10$; * $p < .05$; ** $p < .01$; *** $p < .001$.

mental analyses was attenuated by 28% after adjusting (vs. 45% in the primary analyses).

Table 4 shows that our second hypothesis was not supported. The aOR for the association between religious involvement and AUD did not differ significantly between Blacks and Whites.

Discussion

We extended prior research (Herd, 1994, 1997) by investigating the role of multiple indicators of religious involvement in the Black–White AUD paradox. We found that religious involvement accounted for part of the association between race and AUD. Our results are consistent with findings on race differences in alcohol use and abstinence among adolescents and abstinence from alcohol use, which showed that controlling for religiosity substantially reduces race differences (Wallace et al., 2003). In our study, among men, the religious involvement indicators combined accounted

for about one fifth of the lower odds of AUD among Blacks. Among women, religious involvement accounted for nearly half of the lower odds of AUD among Blacks. These gender differences could reflect the different quality of social support Black women receive from religious involvement in relation to men (van Olphen et al., 2003).

The results of supplemental analyses adjusting for co-occurring psychiatric and substance disorders suggest that the role of religious involvement in accounting for Black–White differences in AUD is potentially independent of other forms of psychopathology. However, it is important to note that the NESARC cannot discern the temporality between episodes of AUD and these other disorders during the past year. To the extent that religious involvement is associated with a lower odds of other disorders, which in turn have a protective effect on AUD, these analyses are “overcontrolling” for factors in the causal pathway. These models are also misspecified to the extent that other comorbidities occur after AUD. Evidence from prospective studies indicates that psychiatric

disorders often precede AUD (e.g., anxiety leading to alcohol problems) (Buckner & Schmidt, 2009), although the association can also be bi-directional (e.g., nicotine dependence preceding AUD in short term but following AUD in the long term) (Jackson et al., 2003).

Our study has the following limitations. Religious denomination was not available in NESARC, which could potentially affect associations between religious involvement and attenuation of Black–White differences. For instance, one study showed that a higher proportion of predominantly Black denominations (i.e., churches in which >80% of parishioners are Black) proscribe alcohol use and impose negative sanctions for alcohol use (e.g., excluding members from participating in choir or other positions) than predominantly White denominations (Ransome, 2014). In contrast, Krause reported that religious denomination did not moderate the association between religious meaning and alcohol abstinence, concluding that “people who find meaning in religion are more likely to avoid the use of alcohol regardless of whether they affiliate with a fundamentalist congregation” (Krause, 2003, p. 527).

Religious involvement was only measured in Wave 2 of NESARC; therefore, we could not establish its temporality with AUD. However, results from several prospective studies suggest that religious involvement is a predictor of later substance use disorders (Good & Willoughby, 2011; Idler & Kasl, 1997; Lambert et al., 2010; Miller et al., 2012). For example, one prospective study showed that among persons with no AUD at baseline, a higher frequency of organized religious attendance was associated with a lower risk of 6-month AUD incidence (Borders et al., 2010). Finally, it is important to consider the extent of causal inferences that can be sustained by our study design. It is unlikely that there were unmeasured confounders of the association between race and AUD per se (VanderWeele & Robinson, 2014). However, our analyses cannot sustain inferences regarding causal mediation (i.e., that race differences in AUD were caused by religious involvement). Race differences could be attributable to other cultural factors not measured by NESARC that are associated with religious involvement and also predict AUD (Brown et al., 2001). Therefore, our conclusions are in reference to the observational association between race and AUD. Both religious involvement and AUD were measured in adulthood, but there could be protective factors in childhood (Breslau et al., 2006) that shape religiosity in adulthood that in turn affect current AUD. There could also be race differences in childhood influences (e.g., parental religious involvement) that are related to religiosity in adulthood (Perkins, 1987) and subsequently manifest as differences in AUD.

Some strengths of this study include examining multiple indicators of religious involvement separately in a nationally representative sample of Black and White men and women. Although we did not consider potential ethnic heterogeneity

among Blacks (or Whites), our key findings may have been similar. For instance, Caribbean-born Blacks—a major Black ethnic group—have slightly lower rates of AUD than U.S.-born Blacks (Broman et al., 2008) but almost no differences in religious involvement across a range of indicators (Taylor et al., 2011). Both Caribbean-born and U.S.-born Blacks had lower lifetime risk of AUD compared with Whites (Gibbs et al., 2013).

The study also used a reliable measure of AUDs, which has been validated across race and ethnic groups in diagnosing AUD (Volk et al., 1997).

Conclusion

This study advances our understanding of the social epidemiology of AUD. We show that core religious involvement indicators, including religious service attendance and subjective religiosity and spirituality, account for a meaningful share of the Black–White difference in AUD. Future research is needed to conduct more fine-grained analyses of the aspects of religious involvement that are potentially protective against AUD, ideally differentiating between social norms associated with religious involvement, social support offered by religious participation, and deeply personal aspects of spirituality.

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