

The Role of Religion in Predicting Adolescent Alcohol Use and Problem Drinking

TAMARA L. BROWN, PH.D.,[†] GREGORY S. PARKS, M.A., RICK S. ZIMMERMAN, PH.D.,[†]
AND CLARENDA M. PHILLIPS, PH.D.[†]

Department of Psychology, University of Kentucky, 115 Kastle Hall, Lexington, Kentucky 40506-0044

ABSTRACT. *Objective:* There are racial differences in adolescents' propensity to consume alcohol—with white adolescents tending to consume more alcohol than black adolescents—but there is no clear explanation for why such differences exist. The purpose of this study was to examine the relationship between religiosity, a cultural factor that is not well understood currently, and racial differences in adolescent alcohol use. *Method:* Participants were white and black ninth-grade adolescents ($N = 899$; 54% female, 57.5% white) involved in a 3-year longitudinal study of ways to reduce alcohol use and sexual risk-taking behavior among adolescents in Ohio and Kentucky. *Results:* Findings indicate that religiosity is differentially associated with alcohol use and problem drinking for white and black adolescents. Religious service attendance was the most significant predictor of alcohol use for black adolescents,

whereas religious fundamentalism was most important for white adolescents. In contrast, frequency of prayer was the significant predictor of problem drinking for black adolescents, whereas the level of importance placed on religion was the significant predictor for white adolescents. Important gender differences also emerged in both prediction models and are discussed. *Conclusions:* Since there is great heterogeneity among adolescents (in terms of race and gender) in their alcohol use and misuse, the "one-size-fits-all" approach to alcohol treatment and prevention is likely inappropriate. Moreover, conceptualizations of alcohol use and misuse, and its prevention and treatment, should include the consideration of such key cultural factors as religiosity. (*J. Stud. Alcohol* 62: 696-705, 2001)

ALCOHOL AND OTHER DRUG USE among adolescents is disturbingly high, and recent national survey data suggest that substance use among adolescents may be increasing (Corwyn et al., 1997; Gfroerer, 1996; Johnson et al., 1996). This is of particular concern since substance use among adolescents has been consistently linked with myriad deleterious outcomes (e.g., physical and psychological health problems, crime and the spread of infectious diseases). The role of alcohol and drugs in adolescent suicide, automobile accidents and drownings, for example, is well established (Office of Technology Assessment, 1991). Adolescents with alcohol use problems also have more physical symptoms (e.g., headaches, appetite changes, eczema) than nonalcohol-problem counterparts (Arria et al., 1995). Increased rates of risky sexual behavior place youths with alcohol use problems at risk for contracting HIV (Kann et al., 1996). In addition, extensive evidence supports the strong relationships among adolescent alcohol use problems, drug use problems and criminal activity (e.g., Barnes and Welte, 1986; Dembo et al., 1994; Fergusson et al., 1996; Huizinga et al., 1994). Investigators (e.g., Riggs et al., 1995)

and reviewers (e.g., Lewinsohn et al., 1995; Weinberg et al., 1998) have concluded that youth with substance use problems evidence high rates of psychiatric comorbidity for such problems as depression and conduct disorder. Together, these (and other) findings suggest that substance use problems during adolescence can disrupt developmental tasks and role performance during early adulthood. However, there may be racial differences in adolescent propensity to consume and/or misuse alcohol.

Racial differences in adolescent alcohol use

Research has consistently shown racial differences in alcohol consumption among adolescents. For example, compared with black adolescents, white adolescents tend to begin drinking at an earlier age, drink more frequently and more heavily, and are more likely to associate with peers who consume alcohol (Beck and Zannis, 1992; Brannock et al., 1990; Higgins et al., 1977; Neff, 1986, 1993; Newcomb et al., 1987; Singer and Petchers, 1987; Wallace and Bachman, 1991; Welte, 1987). These racial difference findings regarding alcohol use suggest that white adolescents are more likely than black adolescents to use alcohol and are, therefore, at greater risk of experiencing its deleterious effects.

Despite the robustness of these racial difference findings over time and across all socioeconomic levels, relatively few compelling explanations have been offered to

Received: September 7, 2000. Revision: March 27, 2001.

[†]Rick S. Zimmerman is with the Department of Communications, University of Kentucky, Lexington, KY. Clarendra M. Phillips is with the Department of Sociology, Social Work, and Criminology, Morehead State University, Morehead, KY. Tamara L. Brown may be reached at the above address or via email at: tbrown2@uky.edu.

explain these differences. Thus, many questions regarding the extent to which subcultural systems that shape drinking behaviors are different for adolescents from different racial backgrounds remain unanswered (Brannock et al., 1990; Dawkins, 1976). What aspects of the ecology of white adolescents (e.g., unique stressors, pressures and/or cultural factors), for example, promote alcohol use? Or, what aspects of the ecology and/or culture of black adolescents protect or buffer them from susceptibility to alcohol use? One factor that might explain racial differences in adolescent alcohol consumption is religiosity, a cultural factor that is currently not well understood (Benda, 1997).

Religiosity

Religiosity is a multidimensional construct that refers to a person's religious fervor, regardless of the content of their beliefs. Religiosity has been found to be a good predictor of a number of important life outcomes for adolescents. Higher levels of religiosity have been shown to be positively correlated with ego strength (e.g., hope, will, purpose, love) (Markstrom, 1999), health status (Brown and Gary, 1994) and prosocial peers and behavior (Donahue and Benson, 1995); it has been negatively correlated with depression, premature sexual involvement and suicide ideation and attempts (Donahue and Benson, 1995; Neeleman et al., 1998). Research also shows that an inverse relationship exists between religiosity and alcohol use (Benda, 1997; Brown and Gary, 1994; Cochran, 1993; Ginn et al., 1998; Herd and Grube, 1996; Patock-Peckham et al., 1998; Zimmerman and Maton, 1992). These findings have tended to be robust despite inconsistency in the way religiosity has been operationalized. In extant research, religiosity has been variously defined in behavioral terms (e.g., frequency of church attendance and conversations with a priest) (Neff and Hoppe, 1993; Zimmerman and Maton, 1992), as the degree to which a person expresses sincere and earnest regard for religion (Cochran, 1993), as agreement/disagreement with statements regarding religious ideals (Patock-Peckham et al., 1998), in terms of family (rather than personal) religiosity (Hardesty and Kirby, 1995) and as synonymous with spirituality. Yet, the link between religiosity and alcohol use (and other important life outcomes) has been shown consistently. What is not clear, however, is whether the religiosity-alcohol use link can also explain racial differences in alcohol use. The current study seeks to fill this important gap in the research literature.

Religious involvement can have different meanings and consequences for adolescents from differing racial backgrounds (Elkind, 1999), and considerable research suggests that religiosity is higher among blacks than whites. For example, in a recent literature review of the relationship between religion and adolescent well-being that was supplemented with secondary analysis of a nationally representa-

tive data set, Donahue and Benson (1995) report that "blacks are more religious than whites" (p. 149). In addition, in a synthesis of findings from five national samples, Taylor et al. (1999) report that race emerges as a strong and consistent predictor of various indicators of subjective religiosity, indicating that blacks have significantly higher levels of subjective religiosity than whites. Numerous other studies (e.g., Neff, 1993; Neff and Hoppe, 1993) have also reported similar racial differences in religiosity.

Purpose of the current study

That there are racial differences in adolescent alcohol use is clear—with white adolescents being more likely to consume alcohol than are black adolescents. The factors that account for this difference, however, are not so clear. Research indicates that religiosity is an important protective factor, in that adolescents who are high in religiosity tend not to use alcohol. It is important to note that blacks and whites differ in their degree of religiosity. The purpose of this study was to directly examine the relationship between religiosity and racial differences in adolescent alcohol use.

Method

Procedure

The data for the current study came from the first two waves of a 3-year longitudinal study that involved the implementation of interventions aimed at reducing alcohol use and sexual risk-taking behavior among adolescents in northern Ohio and Kentucky schools. During the fall of 1995, schools in northern Ohio and Kentucky that taught health education during ninth or tenth grade, had at least 200 students in the current ninth-grade class and had a student body that was 17-70% black were invited to participate. Seven school districts in northern Ohio and one high school in north-central Kentucky declined to participate (most reported declining because the administrators felt the content of the survey or curriculum would be too explicit to be accepted by their communities). Ten high schools in Kentucky and seven high schools in northern Ohio agreed to participate. For students to participate, parental consent and student assent were required. Consent rates ranged from 50% to 84% at the 17 schools, with an overall consent rate of 63%. Students were followed from the beginning of the ninth to the end of the eleventh grade, with surveys near the beginning and end of ninth grade and near the end of the tenth and eleventh grades. The primary data collection approach for the variables used in this study was self-administered comprehensive surveys. Only the religiosity variables were collected at Time 2; all other variables used in this study came from the first wave of data. For addi-

tional information on this study, please see Donohew et al. (2000).

Participants

Participants in the current study were 899 white and black ninth-grade adolescents (264 white females, 236 white males, 199 black females and 162 black males; 38 participants did not respond to the gender question) who participated in both the first and second waves of data collection and for whom complete data were available on all variables of interest. (Of the 2,961 participants, 2,779 were ninth graders [approximately 94%]. Only black and white adolescents were included in this study; 2,327 [84%] of the full sample were either black or white. Because of sample attrition, Time-2 data were available for only 1,826 black and white participants. Of these, due to methodological constraints on the study design, only 50% of the sample was administered the religion items, further reducing the available data for the current study to a maximum of 1,233 participants. Since an inclusion criteria was that participants had to have complete data on all variables of interest in this study, the sample size of the black and white ninth-graders with complete data on all variables for this study was 899.) Although participants ranged in age from 14 to 19, most participants were either 14 (57.6%) or 15 (34.2%) (mean [SD] = 14 [0.696]).

Measures

Demographics. Participants were asked to indicate their race/ethnicity, gender and age.

Alcohol use. To assess alcohol use, participants were asked to indicate on how many days they had consumed alcohol during the past month. Alcohol use in the past month was the dependent variable in higher-order analyses conducted in this study. Two other alcohol use variables were used descriptively. One asked participants to indicate the number of drinks they consumed the last time they drank, and the other asked participants how often, when they drink, they drink to get drunk.

Problem drinking. As a proxy for alcohol abuse, a problem-drinking composite variable was computed by summing the four problem drinking variables. Those items were "Have you ever gotten into a fight during or after drinking?"; "Have you ever done things that you later regretted when drinking?"; "Have you ever been unable to remember things that happened while drunk?"; and "Have you ever been hassled by friends or family because of your drinking?" Participants responded on a 4-point Likert scale, in which 1 = no; 2 = yes, once; 3 = yes, a few times; and 4 = yes, a lot. Scores on the composite variable ranged from 4 to 16, and Cronbach's alpha was 0.71, indicating good internal consistency for this scale.

Religiosity. Four questions were asked to tap religiosity. Participants were asked, "How often do you attend religious services?" and responded on a 4-point scale, in which 1 = never, 2 = rarely, 3 = once or twice a month and 4 = about once a week or more. "How often do you pray?" was responded to using a 6-point scale, in which 1 = never, 2 = less than once a week, 3 = once a week, 4 = several times a week, 5 = once a day and 6 = several times a day. "How important is religion in your life?" was answered using a 4-point scale, in which 1 = not at all important, 2 = a little important, 3 = pretty important and 4 = very important. Last, as a proxy for fundamentalism in religious beliefs, participants were asked to indicate which of three statements described their feelings about the Bible (or Koran or other holy book). The first statement, coded 1, was "no more than an ancient book of stories, history and rules written down by people." The second statement, coded 2, was "the inspired word of God, but not everything in it should be taken word for word." The third statement, coded 3, was "the actual word of God and is to be taken literally, word for word." Since each of these variables represent conceptually distinct aspects of the construct religiosity, each was used as a separate predictor variable in the analyses.

Results

Descriptive analyses

Religiosity. Few adolescents (8%) indicated that religion was not at all important in their lives. Overall, most participants reported that they pray at least several times a week (56%), although a sizable number of adolescents indicated that they rarely, if ever, pray (35%). Although many adolescents reported attending religious services about once per week (34%), 49% reported they never or rarely attended religious services. The sample was about evenly split in terms of fundamentalism; about 47% were very fundamentalist in their religious beliefs (i.e., believing that the Bible is the actual word of God and should be taken literally word for word) and 43% were somewhat more liberal in their beliefs (i.e., believing the Bible is the inspired word of God, but not everything in it should be taken literally). Means on each of the religiosity variables are presented in Table 1.

T tests conducted comparing the religiosity of black and white adolescents revealed statistically significant differences on each of the religiosity variables. As can be seen in Table 1, black and white adolescents differ significantly in their ratings of the importance of religion, with black adolescents reporting greater importance than did white adolescents: 52% of black adolescents said religion was very important to them, compared to 22% of white adolescents. Black adolescents also reported praying significantly more often than did white adolescents; 47% of black adolescents

TABLE 1. Descriptives

	Overall sample (N = 899)	Black (n = 382)			White (n = 517)		
		Total	Male	Female	Total	Male	Female
Religiosity variables							
Service attendance	2.72 (1.07)	2.88* (1.07)	2.83 (1.08)	2.91 (1.07)	2.60 (1.06)	2.54 (1.07)	2.65 (1.04)
Frequency of prayer	3.64 (1.67)	4.00* (1.64)	3.69 (1.62)	4.21 (1.61)	3.38 (1.64)	3.09 (1.66)	3.63 (1.59)
Importance of religion	2.93 (0.96)	3.26* (0.89)	3.20 (0.93)	3.31 (0.84)	2.68 (0.94)	2.61 (0.98)	2.75 (0.91)
Fundamentalism	2.38 (0.66)	2.57* (0.56)	2.61 (0.54)	2.54 (0.57)	2.23 (0.69)	2.22 (0.70)	2.24 (0.67)
Alcohol use variables							
Use in last month	1.75 (1.22)	1.56 (1.05)	1.63 (1.11)	1.48 (0.95)	1.89* (1.31)	1.91 (1.38)	1.90 (1.27)
Number of drinks last time	2.26 (1.74)	1.92 (1.46)	2.15 (1.68)	1.65 (1.08)	2.54* (1.88)	2.56 (1.98)	2.52 (1.77)
Drinking to get drunk	2.15 (1.33)	1.90 (1.18)	1.99 (1.22)	1.78 (1.13)	2.33* (1.39)	2.40 (1.38)	2.24 (1.31)
Problem drinking variable	5.20 (2.09)	4.81 (1.69)	4.95 (2.00)	4.61 (1.35)	5.49* (2.31)	5.43 (2.39)	5.53 (2.22)

Notes: Standard deviations are presented in parentheses. Significance tests were conducted to determine whether black and white adolescents differed. When statistically significant differences were observed, the asterisks indicate which group gave the higher endorsement on the significant item.
*p < .0001.

reported that they pray at least once per day compared with 32% of white adolescents. Significantly more black than white participants indicated that they attend religious services at least once per week (42% vs 29%, respectively). Last, significantly more black adolescents tended to be fundamentalist in their religious beliefs (61% vs 38%), whereas more white adolescents tended to be liberal (48% vs 36%).

Alcohol use and problem drinking. Although nearly all adolescents (75%) reported they had consumed alcohol in their lifetime, only 38% reported they had consumed alcohol in the past month, and most of those that had consumed alcohol in the past month reported drinking on only 1 or 2 days (48%). A minority (19%) of adolescents indicated that when they drink they always or often drink to get drunk; 46% of adolescents said they never drink to get drunk. There were significant differences between black

and white adolescents in their alcohol use and problem drinking. White adolescents reported drinking significantly more frequently in the past month than did black adolescents. In addition, as shown in Table 1, white adolescents reported consuming more drinks the last time they drank than did black adolescents and were significantly more likely to report drinking for the purpose of getting drunk than were black adolescents. For example, only 7% of black adolescents indicated that the last time they drank they consumed five or more drinks, compared to 20% of white adolescents. Also, 24% of white adolescents reported that when they drank they often or always drank to get drunk, whereas 12% of black adolescents made this report. Moreover, as can be seen in Table 1, mean scores on the problem-drinking scale indicate that white adolescents had more significant drinking problems than did black adolescents.

TABLE 2. Correlations between religiosity and outcome variables

	Overall sample (N = 899)		Black adolescents				White adolescents			
			Male (n = 162)		Female (n = 199)		Male (n = 236)		Female (n = 264)	
	Etoh use ^a	Prob. drink ^b	Etoh use	Prob. drink	Etoh use	Prob. drink	Etoh use	Prob. drink	Etoh use	Prob. drink
Service attendance	-.12 [†]	-.13 [†]	-.09	-.03	.04	-.02	-.15 [†]	-.17 [†]	-.15*	-.13*
Frequency of prayer	-.09 [†]	-.06	-.07	-.01	-.06	-.06	-.03	.02	-.09	-.11
Fundamentalism	-.17 [†]	-.09 [†]	-.14	-.05	-.07	-.11	-.25 [†]	-.10	-.05	.00
Importance of religion	-.11 [†]	-.13 [†]	-.01	.15	-.04	-.16*	-.11	-.07	-.10	-.09

Note: 38 participants did not respond to the gender question.
^aAlcohol use variable; ^bproblem-drinking variable.
*p < .05; [†]p < .01.

TABLE 3. Hierarchical multiple regression analyses predicting alcohol use

Predictor	Step	R ²	F	df	Beta	ΔR ²	ΔF
Black adolescents							
Demographics	1	0.02	3.63*	2/349	—	—	—
Gender		—	1.14	—	-0.06	—	—
Age		—	5.26*	—	0.12	—	—
Religion variables	2	0.04	2.11	6/345	—	0.02	1.35
Gender		—	1.10	—	-0.06	—	—
Age		—	3.65	—	0.10	—	—
Attendance		—	0.06	—	0.02	—	—
Prayer		—	1.48	—	-0.07	—	—
Fundamentalism		—	3.05	—	-0.10	—	—
Importance		—	0.25	—	0.03	—	—
Interaction terms	3	0.05	2.69 [†]	10/344	—	0.02	5.98 [†]
Gender		—	7.07 [†]	—	-0.41	—	—
Age		—	3.93*	—	0.11	—	—
Attendance		—	4.88*	—	-0.39	—	—
Prayer		—	0.98	—	-0.06	—	—
Fundamentalism		—	4.35*	—	-0.12	—	—
Importance		—	0.48	—	0.05	—	—
Gender by attendance		—	5.98*	—	0.56	—	—
White adolescents							
Demographics	1	0.03	6.75 [†]	2/489	—	—	—
Gender		—	0.08	—	0.01	—	—
Age		—	13.50 [†]	—	0.16	—	—
Religion variables	2	0.06	5.37 [†]	6/485	—	0.04	4.59 [†]
Gender		—	0.13	—	0.02	—	—
Age		—	13.31 [†]	—	0.16	—	—
Attendance		—	4.88*	—	-0.12	—	—
Prayer		—	0.22	—	0.03	—	—
Fundamentalism		—	6.50*	—	-0.13	—	—
Importance		—	0.004	—	0.003	—	—
Interaction terms	3	0.08	5.62 [†]	10/484	—	0.01	6.69 [†]
Gender		—	5.57*	—	-0.35	—	—
Age		—	13.85 [†]	—	0.16	—	—
Attendance		—	5.66*	—	-0.13	—	—
Prayer		—	0.27	—	0.03	—	—
Fundamentalism		—	11.14 [†]	—	-0.47	—	—
Importance		—	0.02	—	0.01	—	—
Gender by fundamentalism		—	6.69 [†]	—	0.52	—	—

* $p < .05$; [†] $p < .01$.

Zero-order correlates of dependent variables

Bivariate correlations were conducted to describe the simple associations between the alcohol use and problem drinking outcome variables and the four religiosity variables. Results are presented in Table 2 and are highlighted in the following discussion.

Alcohol use. In general, alcohol use was inversely associated with fundamentalist religious beliefs ($r = -0.17$, $p < .01$). That is, the more fundamentalist adolescents were in their religious beliefs, the less alcohol they consumed, an overall pattern that held for both black ($r = -0.28$, $p = .002$) and white ($r = -0.16$, $p = .027$) adolescents (not shown). Important gender findings also emerged for white adolescents. As can be seen in Table 2, although there were no significant associations between alcohol use and religiosity

for black youth, the pattern of relationships varied by gender for white adolescents. For white males, alcohol was negatively associated with both service attendance ($r = -0.15$, $p < .05$) and fundamentalism ($r = -0.25$, $p < .01$); that is, white male adolescents were less likely to use alcohol if they were fundamentalist in their religious beliefs and frequently attended religious services. For white females, however, the only religiosity variable linked with alcohol use was service attendance ($r = -0.15$, $p < .05$), indicating that more frequent service attendance was associated with less alcohol consumption.

Problem drinking. In the aggregate, problem drinking was associated with two of the religiosity variables, but only for white adolescents: Problem drinking was inversely associated with service attendance ($r = -0.21$, $p = .004$) and fundamentalism ($r = -0.16$, $p = .024$) (not shown). In other

TABLE 4. Hierarchical multiple regression analyses predicting problem drinking

Predictor	Step	R ²	F	df	Beta	ΔR ²	ΔF
Black adolescents							
Demographics	1	0.04	8.00 [†]	2/379	—	—	—
Gender		—	0.90	—	0.05	—	—
Age		—	15.71 [†]	—	0.20	—	—
Religion variables	2	0.06	3.88 [†]	6/375	—	0.02	1.79
Gender		—	0.66	—	0.04	—	—
Age		—	12.80 [†]	—	0.18	—	—
Attendance		—	6.52*	—	-0.15	—	—
Prayer		—	1.32	—	0.07	—	—
Fundamentalism		—	0.02	—	-0.007	—	—
Importance		—	0.15	—	0.03	—	—
Interaction terms	3	0.07	4.16 [†]	10/374	—	0.01	5.52*
Gender		—	6.08*	—	0.28	—	—
Age		—	12.14 [†]	—	0.18	—	—
Attendance		—	6.24*	—	-0.15	—	—
Prayer		—	6.81 [†]	—	0.44	—	—
Fundamentalism		—	0.01	—	-0.01	—	—
Importance		—	0.06	—	0.02	—	—
Gender by prayer		—	5.52*	—	-0.48	—	—
White adolescents							
Demographics	1	0.01	1.16	2/233	—	—	—
Gender		—	0.60	—	-0.05	—	—
Age		—	1.33	—	0.08	—	—
Religion variables	2	0.02	0.95	6/229	—	0.01	0.85
Gender		—	0.59	—	-0.05	—	—
Age		—	1.78	—	0.09	—	—
Attendance		—	0.56	—	0.06	—	—
Prayer		—	0.76	—	0.07	—	—
Fundamentalism		—	0.31	—	-0.04	—	—
Importance		—	2.48	—	-0.12	—	—
Interaction terms	3	0.06	1.93	10/228	—	0.03	7.65 [†]
Gender		—	6.11*	—	0.63	—	—
Age		—	1.71	—	0.09	—	—
Attendance		—	0.55	—	0.05	—	—
Prayer		—	0.43	—	0.05	—	—
Fundamentalism		—	0.06	—	-0.02	—	—
Importance		—	3.95*	—	0.42	—	—
Gender by importance		—	7.65 [†]	—	-0.92	—	—

**p* < .05; [†]*p* < .01.

words, for white adolescents, having fundamentalist beliefs and attending religious services frequently were associated with less problematic alcohol consumption. Moreover, frequent service attendance was associated with fewer drinking problems for both white males (*r* = -0.17, *p* < .01) and females (*r* = -0.13, *p* < .05). It is important to note that religiosity was not associated with problem drinking for black adolescents as a group. However, the importance of religion was significantly associated with problem drinking for black females (*r* = -0.16, *p* < .05); that is, black females for whom religion was very important tended to have fewer problems with drinking.

Predicting alcohol use

Separate hierarchical multiple regression analyses were conducted for black and white adolescents, with alcohol

use in the past month as the dependent variable. In each regression analysis, demographic variables were entered on the first step and the four religiosity variables were entered on the second step. Since the correlational analyses suggest that gender is important, the third step of each regression contained four gender by religiosity interaction terms (i.e., gender by service attendance, gender by prayer, gender by fundamentalism and gender by importance of religion), which were allowed to enter in a stepwise fashion. As shown in Table 3, different prediction models emerged for black and white adolescents. For black adolescents, the gender by service attendance interaction term was a significant predictor of alcohol use (*F* = 5.975, 1/344 df, *p* = .0150). Alcohol use by black males appeared to be invariant across level of service attendance. For black females, low or high attendance at religious services was associated with lower alcohol use, whereas moderate attendance was associated

with high alcohol use. In contrast, the gender by fundamentalism interaction term was the significant predictor of alcohol use for white adolescents ($F = 6.691$, 1/484 df, $p = .0100$). Alcohol use by white females appeared to be invariant across level of fundamentalism. For white males, however, alcohol use was lowest under conditions of high fundamentalist beliefs and highest under conditions of low fundamentalist beliefs.

Predicting problem drinking

Separate hierarchical multiple regression analyses were also conducted using the problem drinking composite variable as the dependent variable. Again, demographic variables were entered on the first step, the four religiosity variables were entered on the second step and the four gender by religiosity interaction terms were entered in stepwise fashion on the third step. Youth who indicated they had never drunk alcohol were excluded from these analyses. As shown in Table 4, different prediction models emerged for black and white adolescents. For black adolescents, the gender by prayer interaction term was a significant predictor of problem drinking ($F = 5.52$, 1/374 df, $p = .0193$). Although problem drinking by black females appeared relatively stable regardless of the amount of prayer, problem drinking increased for black males under conditions of frequent prayer. In contrast, the gender by importance of religion interaction term was the significant predictor of problem drinking for white adolescents ($F = 7.65$, 1/228 df, $p = .0061$). For white males, problems with drinking were lowest when religion was viewed as not at all important; however, ratings of problem drinking increased when religion was important, regardless of the level of importance. In contrast, for white females, problem drinking was highest when religion was not at all important and lowest when religion was important, regardless of the level of importance. In fact, problem drinking was the same for white males and females who considered religion important and different for white males and females who did not consider religion at all important, with white females reporting more problems with drinking than did white males.

Discussion

Consistent with extant literature, black adolescents were more religious in this study than white adolescents. Compared with white adolescents, black adolescents rated religion as more important, prayed more often, attended religious services more frequently and were more fundamentalist in their religious beliefs. A number of scholars have addressed this difference and reasons it may be so pronounced, and most have pointed to cultural explanations. From a historical perspective, Nobles (1991) argues that religion was an integral part of life in Africa that satu-

rated every part of people's existence. Religion also played an important role during slavery (Pipes, 1988) in ways that have persisted until today. For example, the church has been both a preserver of black heritage and an agent for reform; no successful movement for improving the conditions of life for black people has been mounted without the support of the church (Billingsley, 1992). Religion has become the closest approximation to a corporate African identity within the African American experience (Lincoln, 1995) and, today, is often the hub of existence in the black community, as well as a holistic ministry and a social center (Feagin and Feagin, 1999). Thus, prevention and intervention research on alcohol use among black adolescents should include the exploration of religiosity as a key protective factor.

Another finding of this study consistent with current literature was that white adolescents consumed more alcohol than did black adolescents and experienced more problems drinking. Beck and Zannis (1992) found that white adolescents were more likely than black adolescents to use alcohol for relief of physical pain, stress or sleeplessness. This suggests that white adolescents may use alcohol as a way to cope with their problems. If it is the case that this is the primary reason white adolescents consume alcohol, future prevention and intervention research should explore the development of alternative coping strategies for white adolescents. These two findings—that black adolescents are more religious and white adolescents consume more alcohol and have more drinking problems—certainly add to the growing literature on differences in adolescent propensity to engage in prosocial and troublesome behaviors. The most important finding of this study, however, was that different dimensions of religiosity significantly predicted alcohol use and problem drinking for black and white adolescents.

Correlational analyses revealed that, although black adolescents were more religious, only one of the religiosity variables (i.e., fundamentalism) was associated with alcohol use for blacks. For white adolescents, both fundamentalist religious beliefs and frequently attending religious services were associated with lower alcohol consumption. In terms of problem drinking, importance of religion was significantly and negatively associated with problem drinking for black females, whereas for white adolescents service attendance was significantly negatively associated with problem drinking. These findings are not surprising when one considers that fundamentalist religions tend to have greater prohibitions on substance use and that the link between religiosity and low substance use has been well established.

Results of alcohol use regression analyses revealed different prediction models for black and white adolescents, with religiosity interacting significantly with gender in the prediction models for both groups. In predicting alcohol use for black adolescents, the most important predictor was

service attendance (i.e., alcohol use was highest for black females under conditions of moderate service attendance and lowest under conditions of either low or high service attendance). Although a linear relationship was expected, this curvilinear finding, with moderate service attendance being least optimal, was likely due to the low use of alcohol in this sample by those with low religious attendance. When low-alcohol users are deleted from the analyses, the results are in the expected linear direction, with greater service attendance being inversely related to alcohol use among black females. It is important to note that religiosity was not at all predictive of alcohol use for black males. That religiosity appeared more important for black females than males is consistent with literature review (Donahue and Benson, 1995), meta-analysis (Donohue, 1985) and opinion poll (Gallop and Bezilla, 1992) findings, all of which indicate that one of the most persistent findings in the scientific study of religion is that females exhibit greater religiousness than males. In contrast, for white adolescents, fundamentalism was the significant predictor of alcohol use. Alcohol use for white females remained fairly constant, regardless of level of fundamentalism although, for white males, alcohol use decreased as fundamentalism increased. Perhaps the amount of alcohol consumed by the white females is normative for white adolescents. If this is true, it would explain why alcohol use for white females was invariant across levels of fundamentalism, and it would suggest that only the white males—who were consuming more alcohol—needed to change their behavior. This is exactly the pattern observed in this study (i.e., a relatively flat line for white females but a decrease to a “normal” level under conditions of increasing fundamentalism for white males) and it is consistent with extant literature suggesting that adolescent males tend to consume more alcohol than adolescent females (e.g., Higgins et al., 1977).

In predicting problem drinking, frequency of prayer was the most important religiosity variable for black adolescents (but only for males), whereas importance of religion was most significant for white adolescents (for both males and females). For black males, problem drinking was highest under conditions of frequent prayer. There are two possible explanations for this finding. First, it is more likely that black males were praying frequently because of their drinking problems than that the opposite was true. Since the correlational nature of these findings makes it difficult to know this for certain, future research using longitudinal designs would help determine directionality. Second, it is possible that adolescent drinking among the black males in this study was indicative of other problems. If this is true, black males may have been simultaneously using drinking and prayer as ways of coping with problems. There is certainly literature to suggest that alcohol (and other substances) is often used as a way to cope with problems (e.g., Beck and Zannis, 1992). Because it is impossible to know if this

is true in the current study, future research on adolescent alcohol use, particularly among black males, should simultaneously assess alcohol use and the existence of other problems adolescents may be experiencing. For white adolescents, the relationship between importance of religion and problem drinking existed for both males and females. When religion was considered important, problem drinking decreased for white females but increased for white males. Although the decrease in problem drinking for white females is consistent with extant literature, the increase in problem drinking for white males when religion is considered important is, at first, paradoxical and seems at odds with current research. One possible explanation for this seemingly paradoxical finding is that, as the importance of religion increases, adolescent males may be more likely to regret their drinking and/or be hassled by family and friends about their drinking. Empirical research using prospective designs would greatly improve our understanding of the nature of the relationship between religiosity and problem drinking for both black and white adolescents.

The findings of this study should be considered in light of the main limitations. First, because the data were correlational, the directionality of the relationships among the variables cannot be inferred from the results presented. The types of questions addressed in this study are answered with greater certainty in longitudinal studies, especially those employing path analyses or structural equation modeling techniques. Second, because the measures used in this study were self-report, the relationships between the variables presented are potentially influenced by measurement method. In addition to the effects of monorespondent bias, there may be interactions between measurement method (i.e., self-report) and other variables (e.g., white youth may be more likely than black youth to reveal substance use information). These limitations notwithstanding, this study makes important contributions to the growing body of knowledge on adolescent alcohol use and cultural variables that can serve as protective factors.

Two implications for future research and for prevention and intervention programs follow from the findings of this study. First, the racial differences that emerged in this study suggest that there is great heterogeneity among adolescents. In addition, the gender differences that emerged suggest that all black adolescents are not alike and all white adolescents are not alike. An implication is that prevention and intervention programs that operate on the premise that “one size (or program) fits all” are inappropriate. To really understand adolescent substance use, and maximally inform policy and prevention/intervention programs, research should go beyond aggregate analyses and begin to examine within-group variation. As well, intervention and prevention programs should, at a minimum, consider racial and gender differences. In terms of religiosity, for example, black females might benefit from family interventions that empha-

size the importance of frequent service attendance, an intervention approach that might have little utility for black males and white adolescents. In contrast, white males may benefit from a program that emphasizes the importance of religion more generally, rather than emphasizing service attendance. Second, results of this study suggest the importance of cultural factors. This study examined religiosity and found that it differentially predicted alcohol use and problem drinking for black and white adolescents, but there are likely other cultural factors that, if examined systematically, might shed additional light on why some adolescents drink and others do not. For example, research suggests that peer, family and school factors influence adolescent substance use; however, whether and how these factors explain racial differences in alcohol use is less well understood. Future research should continue to explore the effects of religiosity and other cultural factors on adolescent alcohol use, as well as the extent to which such factors account for racial/ethnic variation in adolescents' propensity to use and abuse alcohol and other drugs. Such research will, no doubt, result in the kind of fine-tuning of existing prevention and intervention programs that will stem the tide of adolescent substance use.

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