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Homeschool and Underage Drinking: Is It More Protective than Public and Private Schools?

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ABSTRACT

This article examines differences in alcohol use between homeschool and both public and private school students. Applying regression analyses to two waves of the National Study of Youth and Religion, we found that homeschoolers were less likely to drink alcohol and get drunk than non-homeschoolers, which was explained in part by variables of social bonding, social learning, and, to a greater extent, religiosity. Specifically, parental monitoring helped explain differences between homeschool and private school students, while association with deviant friends partially accounted for differences with public school students. Religiosity, however, explained differences between homeschoolers and *both* types of non-homeschoolers.

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Introduction

The family and school are widely recognized as critical arenas of adolescent socialization in criminological theories, due to their importance in the development of both social capital and cultural resources in individuals (Agnew 2006; Akers 2009; Gottfredson and Hirschi 1990; Hirschi 1969). While the prevalence of homeschooling, a social institution that intersects family and education, is relatively low—currently representing less than 4% of school-aged children in the United States (Ray 2011)—it has gained legal and popular legitimacy over the last few decades, and its growth rate "has been nothing short of remarkable" since the 1970s (Murphy 2012:10). Research on homeschooling, however, has been limited not only in number but also in scope, as it has focused on pro-social outcomes such as academic achievement and conventional socialization of homeschoolers (see Cizek 1994; e.g., Cordner 2012; Ray 2004; Uecker 2008). Grossly lacking is research on antisocial behaviors among homeschool students.

Some parents choose to homeschool because of a pragmatic desire to provide an individualized education in order to better prepare their children for future economic opportunities, but many others are motivated by deep, ideological convictions regarding the preeminence of family and religion over secularized social institutions (Cizek 1994; Collom 2005; Jeub 1994; Lines 1994; Murphy 2012). When a family decides to homeschool rather than send their children to public or private school for such reasons, they fundamentally alter the structure in which the children relates to both their parents and peers. Particularly, if parents' religion was the reason for the choice of homeschooling, their religiosity is expected to influence their children's relationships with parents and friends. Specifically, the influence is not only through their traditional parenting (mostly based on religious principles) but also religious socialization of children so they may become religious themselves, which is in turn likely to decrease their antisocial behaviors, such as drug use (e.g., Jang and Johnson 2011).

Thus, homeschooling has potential implications for two major micro-level theories of delinquency: (1) social bonding theory, which posits that adolescents are restrained from delinquency

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by virtue of their attachment to conventional others, commitment to conventional goals, involvement in conventional activities, and prosocial beliefs (Hirschi 1969); and (2) social learning theory, which proposes that delinquent behavior is both learned by imitating or associating with deviant others and conditioned through reward/punishment schedules (Akers 1985, 2009; Akers et al. 1979; Sutherland and Cressey 1970). Additionally, researchers in the criminology of religion have consistently found both direct and indirect effects of religious variables on delinquency (Baier and Wright 2001; Johnson and Jang 2011). Religion is therefore also relevant to the explanation of the homeschooling–delinquency relationship because it has not only played a prominent role in the historical emergence of homeschooling but also serves as an important motivation for homeschooling today. However, criminological research on homeschool students is practically nonexistent, although criminologists have long studied delinquency and drug use among public and private school students (e.g., Gottfredson et al. 2005; Maguin and Loeber 1996; Payne 2009; Wiatrowski et al. 1982).

To fill this gap in research, we first hypothesize that adolescents who are homeschooled tend to drink alcohol and get drunk less often than those who attend public and private (religious or otherwise) schools. The expected negative association between homeschooling and alcohol use is also hypothesized to be explained by variables of social control, social learning, and religion. We conducted ordinary least squares regression analyses to test these hypotheses using data from the first two waves of the National Study of Youth and Religion.

The modern rise of American homeschooling

Homeschooling emerged as a countercultural movement that was "largely a reaction against the mass culture of the modern liberal state" (Gaither 2008:85), and it arose from two fronts, one pedagogical and largely secular, the other ideological and mostly religious (see also Aurini and Davies 2005; Basham, Merrifield, and Hepburn 2007; Gaither 2009; Lyman 1998). These unlikely allies were motivated to seek educational alternatives for reasons ranging from alienation in public schools due to traditional values of the families to concerns regarding dehumanization resulting from the bureaucratic organization of the public school system. Today, the decision to homeschool is often complex; while most families who homeschool are religious, being typically conservative Protestant (Ray 2004), they decide to homeschool for a variety of academic, familial, religious, and social reasons (Jeub 1994). But if there is one underlying theme, the decision to homeschool is generally about parents reclaiming control and exerting power over the educational system to provide their children with both traditional values and relevant preparation for emerging economic patterns and workplace demands (Collom 2005; Lines 1994; Murphy 2012:76–77).

Homeschooling is relatively small and relatively new. When the contemporary homeschooling movement first emerged in the early 1970s, only about 10,000 to 15,000 children were homeschooled in the United States, but it quickly burgeoned to between 120,000 and 240,000 children by the mid-1980s (Gaither 2009:341; Murphy 2012:7–8) during a period in which it began to gain social and legal legitimacy through a series of court battles (Cooper and Sureau 2007). And it continued to grow. By 2003, it was estimated, the number of homeschooled children had eclipsed one million (Princiotta, Bielick, and Chapman 2004), and today, over two million school-age students are estimated to be homeschooled (Murphy 2012:10; Ray 2011). Although this represents less than 4% of the total school-age population in America, growth rates are estimated to be between 7% and 20% per year (Basham et al. 2007; Bauman 2001; Murphy 2012:10).[1]

[1]Statistics regarding both the size and growth rate tend to vary because, generally speaking, data on home education is difficult to collect. Procedures for tracking homeschool enrollment vary by state, and due to transience between school types, homeschoolers are likely to be underreported in official statistics (Aurini and Davies 2005:462–463; Kunzman 2010:19; Murphy 2012:12).

Homeschooling and social bonds

Homeschooling, according to proponents, intends to enhance attachment between children and their parents and siblings (e.g., Ballmann 1987:82; also see Barfield 2002:21; Ray 2014). One of the driving factors in the origin of contemporary homeschooling, according to Milton Gaither (2008:113), was the "American cult of the child," experienced by progressives and conservatives alike, whereby parents sought to "liberate the kids from what they took to be the deadening effects of institutionalization by keeping them at home." Certainly, the costs of homeschooling can be quite high, typically requiring extensive investment of time and resources on behalf of parents and usually the forgoing of at least one potential income (Barfield 2002:184; Lubienski 2000:209), but school choice is typically quite personal and sentimental rather than being based on cold economics or pure rationality (Davies and Quirke 2005). Today, the primacy of the family as a key social institution is a central tenant for most homeschool parents (Jeub 1994; Murphy 2012:103). Indeed, the top reason given for homeschooling by parents responding to the 1999 National Household Education Survey (NHES) was a belief that they could provide a better education in the home (Bielick, Chandler, and Broughman 2001:10). Additionally, unspecified "family reasons" was the fourth most common response.

We expect homeschooling to decrease adolescent children's use of alcohol by virtue of at least three mechanisms related to Hirschi's (1969) social bonding theory. First, to the extent that homeschooling promotes family cohesion, adolescents should be less deviant because of enhanced attachment to parents that influences children's behavior even when parents are not physically present, which Hirschi (1969:89) called "virtual supervision." In his theory, Hirschi placed less emphasis on direct than indirect (i.e., virtual) supervision by parents since adolescent children tend to spend most of their time at school, whether public or private, without their parents being around. However, parental supervision is of special relevance to homeschooling because it structurally allows consistent parental supervision most of the day, including the times in which their children are attending school at home. Second, increased involvement in conventional activities is expected to decrease alcohol use. Contrary to the concerns of homeschooling critics about potential social isolation (Kunzman 2009b:98; Medlin 2000), proponents argue that homeschooling offers a number of socializing advantages, including involvement in a greater number of extracurricular activities (Medlin 2000:110–111), as well as those with their parents (Barfield 2002:46–47; Kunzman 2009b:18).[2] Third, because many families choose to homeschool for academic reasons (Bielick et al. 2001; Jeub 1994; Princiotta et al. 2004; Ray 2004), homeschool students are likely to have an increased commitment to education.

Homeschooling and deviant learning

An implicit desire to limit exposure of teens to sex, drugs, violence, and negative peer pressure appears to motivate many parents to homeschool their children. According to proponents, educating children in the home allows for better control of social interactions, especially those with deviant peers (Ballmann 1987:71–74; Jeub 1994). And, in fact, the third most common reason for homeschooling on the 1999 National Household Education Survey (NHES) was a "poor learning environment at school" (Bielick et al. 2001:10). By the 2003 NHES, concerns about the environment of other schools, including issues regarding safety, drugs, or negative peer pressure, was the most commonly cited motivation for homeschooling (Princiotta, Bielick, and Chapman 2006:14). More than 85% mentioned it as a reason for homeschooling, and for nearly a third of all respondents, it was the single most important reason.

Sutherland's differential association theory proposed that criminal behavior, like all behavior, is learned in interaction with intimate personal groups whose members provide "definitions" either

[2]A characteristic of homeschooling that is especially consistent with the alternative teaching philosophies of the progressive "unschoolers" is the use of more "hands-on" learning experiences outside the home, as opposed to formal teaching sessions in a learning environment that is functionally disconnected from the subject of instruction (Gaither 2008:125–126; Lyman 1998:3).

favorable or unfavorable to violating the law to an individual, as well as both techniques and motivations for committing criminal acts (Sutherland and Cressey 1970:75–76). Both the ratio of conventional to deviant peers and the strength of friendships with these peers help form an individual's orientation to the law. In his social learning theory, Akers (2009:163–164) suggests that association with deviant peers is, next to an individual's own prior delinquency, "the single best predictor of the onset, continuance, or desistance of delinquency" not only because deviant behavior is often conducted (and typically first becomes available) in peer-group contexts, but also because interactions with deviant peers serve to normalize deviant behavior. And notably, differential association has been found to be a powerful determinant of drug and alcohol use among adolescents (Akers et al. 1979; Curran, Stice, and Chassin 1997).

The decision to homeschool for these parents is therefore an intentional effort to alter the differential association of their children while also potentially facilitating differential reinforcement schedules. Homeschooling is thus expected to be negatively associated with adolescent drinking by virtue of at least two mechanisms related to Aker's (1985; 2009) social learning theory. First, they are less likely to be associated with alcohol-using friends to whom they would otherwise be exposed at public or private schools who could serve as deviant role models. Second, because homeschooling allows parents to more consistently monitor their teens' behavior, they are also more able to consistently punish their teens for delinquency.

Homeschooling and religion

Religion has played a key role in the emergence and growth of the homeschooling movement, and remains an important motivator for homeschooling, especially for parents who feel a moral imperative to nurture their children's moral and spiritual development (Ballmann 1987:77–79; Cizek 1994:45–46; Kunzman 2009a:315, 2009b:75; Murphy 2012:88). According to the 1999 NHES, religion and the development of character or morality were two of the top five reasons cited by parents who homeschool (Bielick et al. 2001:10). On the 2003 NHES, nearly 72.3% cited their ability to provide religious or moral instruction as a reason for homeschooling, including nearly a third of all respondents that said it was their top reason, which is second only to concerns about school environment (Princiotta et al. 2006:14). While there is evidence that religiously based motivations are shifting (Murphy 2012:79) or becoming intertwined with other reasons, conservative Christians who strongly emphasize biblical orthodoxy represent the majority of homeschool families, and a growing proportion observe Buddhism, Judaism, Mormonism, Islam, and New Age faiths as well (Gaither 2009:342; Murphy 2012:23; Ray 2004:6).

Since Hirschi and Stark's (1969) "hellfire" study stirred debate both about research methodology (e.g., Higgins and Albrecht 1977; Johnson et al. 2001) and theoretical framing,[3] the prosocial effect of religion on crime and delinquency has been well-demonstrated. For example, in a meta-analysis of 60 criminological studies, Baier and Wright (2001) found that religion has a moderate but significant deterrent effect on crime, whereas a systematic review of 270 studies by Johnson and Jang (2011) revealed that about 90% of studies that have included relevant variables reported prosocial effects of religiosity on crime and delinquency (see also Jang 2013).

It can be argued that religion is (at least partially) exogenous to the variables related to the established micro-level theories of crime, such that criminological theorists have tended to neglect religion (Cullen 2011). For example, religious individuals might be expected to commit less crime as a result of (1) increased bonding to conventional others, (2) increased self-control through the internalization of religious norms and encouragement of self-monitoring through religious socialization, and (3) increased association with more conventional peers and decreased association with delinquent friends (Jang and Johnson 2003; Johnson and Jang 2011:122; Ulmer 2012). However,

[3]As an example of the latter, Stark (1996) himself eventually developed a "moral communities" thesis, which understands the effects of religion in social, rather than purely individual, terms (see also Regnerus 2003). The deterrent effects of religiosity, he explains, needs to be activated by social contexts where religion is influential in constructing group norms.

prior research tends to suggest that the effect of religion is not merely indirect, let alone spurious (e.g., Cochran, Wood, and Arneklev 1994; Ellis 1987), finding "direct" effects of religion on crime and delinquency to remain unexplained, even after controlling for their criminological predictors (Johnson and Jang 2011:123).[4] Both indirect and direct effects of religion on criminality are likely because of the holistic nature of religion that tends to influence nearly every dimension of an individual's social world (Ulmer 2012). It is also possible, however, that the effects of homeschooling on deviance are spurious, as parental religiosity may directly affect both the choice to homeschool and adolescent drinking.

Before introducing our hypotheses, it is worthwhile to briefly compare homeschooling and private schooling since they share the same motivation to avoid public schooling.

Homeschooling versus private schooling

Private school students account for about 10 to 11% of school-aged children in the United States (Alt and Peter 2002). A large majority (68 to 79%) are religiously affiliated, and while less than a quarter of all private schools are Catholic, they account for nearly half of all private school students (Alt and Peter 2002; Broughman and Swaim 2013).

In some ways, private school and homeschool parents are similar in that they both often choose an alternative to public education within a culture of "intensive child rearing" as a method for providing individualized educational experiences to meet particular needs of children (Aurini and Davies 2005; Davies and Quirke 2005). Just as an emphasis on family values motivates many parents to homeschool, the same values lead other parents to send their children to private schools. These schools, especially when religious, often encourage parental involvement in the education of children (Jeynes 2002; Sikkink 2001), which is precisely what homeschool parents do. Also, like a typical homeschool, a majority of private schools emphasize religious and moral education as well as academic excellence and student discipline (Sikkink 2001), which tends to decrease antisocial behaviors among students.

In other ways, however, they differ. According to Aurini and Davies (2005), parents often choose private over public schooling for implied interests related to class reproduction because they can afford it, which is not often the case with their homeschool counterparts. For example, students from the upper quartile are highly over-represented at Catholic schools (Hunt 2005), and only 10% of private school students (compared to 42% of public school students) are eligible for government-subsidized lunches (Alt and Peter 2002). Similarly, families who choose Protestant schools tend to have two-parent and two-income environments, with parents who have higher than average education and income (Sikkink 2001). In contrast, both homeschool and public school students are much less likely to live in households with annual incomes greater than $75,000, and much more likely to live in households with annual incomes less than $25,000 (Princiotta et al. 2006). In addition, private school parents are more similar to public school than homeschool parents in terms of their limited ability of direct control, such as supervision or monitoring of their children's activities when they are at school.

In sum, like homeschool students, private school students are less likely to drink alcohol than their public school peers because private schools tend to (1) encourage parental involvement in education, (2) promote strict disciplinary policies, and (3) emphasize religious and moral education compared to public schools. On the other hand, private school students are likely to be at higher risk of underage drinking than homeschool as well as public school students given their relatively low levels of parental control as well as high family socioeconomic status that tends to be positively associated with adolescent use of alcohol (Bellis et al. 2007; Humensky 2010). As a result, private

[4]The mechanisms by which religion directly reduces criminality might include specifically religious or spiritual (as opposed to merely conventional) coping strategies, as well as doctrines of forgiveness by which vengeance is discouraged (Johnson and Jang 2011). Francis T. Cullen (2011:155) also suggests that religion increases social support, and that faith in a loving God might reduce punitive sentiments.

school students are expected to drink alcohol less often than public school students but somewhat more than homeschool students.

Hypotheses

Taken together, we expect homeschooling to decrease adolescent use of alcohol because it provides a differential social organization in which he or she is more likely to relate to conventional (e.g., parents) than unconventional others (e.g., deviant friends). Thus, our baseline hypothesis states:

H1: Homeschool students are less likely to (a) drink alcohol and (b) get drunk than their peers attending public or private school.

This negative association is also hypothesized to be mediated by variables of social bonding and social learning theories as well as student's and parent's religiosity:

H2: The expected differences in alcohol use between homeschooled and non-homeschooled adolescents are likely to be attributable to their differences in (a) social bonds, (b) deviant learning, and (c) religiosity.

Methods

Data

Data for this study come from the National Study of Youth and Religion (NSYR), a nationally representative longitudinal telephone survey collected by researchers at the University of North Carolina at Chapel Hill. The first wave of the study was conducted between July 2002 and April 2003 (Time 1) using a random-digit-dial (RDD) method, and researchers conducted interviews with 3,290 English- and Spanish-speaking teenagers aged 13 to 18.5, as well as one parent of each respondent.[5] The second wave of the survey was conducted from June to November 2005 (Time 2), with a total of 2,604 of the original respondents participating (retention rate of 78.6%). Respondents were 16 to 20 years old at Time 2, all remaining below the legal age of drinking alcohol. Diagnostic analyses comparing the NSYR with U.S. Census data and other comparable adolescent surveys confirm that it provides a nationally representative sample when constructed raw weights are used (see Smith and Denton 2005:292).

While the number of panel studies on delinquency with a national probability sample of adolescents in the United States is small (Akers 2009), even smaller, by extension, is the number of longitudinal studies for homeschooling students, due to the relatively short history of the movement and the difficulty with collecting data on home education. The NSYR is an unusual data source for the analyses proposed here, as it represents one of the first panel studies that allow for differentiation of homeschooling from other forms of secondary schooling.

Measurement

Our dependent variable, alcohol use, is operationalized by two survey items (see Appendix A for their wording). One asks about frequency of *drinking* on a seven-point ordinal scale that ranges from (1) "Never" to (7) "Almost every day" or "Once a day or more," whereas the other measures a more serious form of alcohol use, frequency of getting *drunk*, which ranges from (1) "Never" to (6) "More

[5]An additional oversample of 80 Jewish households was also interviewed, but these cases were excluded from our analysis as recommended by Smith and Denton (2005:292) because they could distort proper proportions when generalizing descriptive results to the national population, as well as introduce potential sampling bias net of other independent variables controlled in multivariate analyses.

than once a week." Alcohol use, especially when excessive, is an important outcome as it relates to adolescents insofar as it represents unhealthy or risky behaviors (Perkins 1987) that are often predictive of more serious criminality (Akers, 2009; Gottfredson & Hirschi, 1990).

Our key independent variable, school type, was coded into a system of dummy variables including (1) *homeschool* (reference category), (2) *public school*, and (3) *private school* based on responses in the first survey. Respondents who reported attending any other type of school or reported not attending school were excluded from the current study.[6] Next, explanatory variables for the expected differences in alcohol use between homeschooled and non-homeschooled students were clustered into three groups.

The first group of explanatory variables are based on social bonding theory (Hirschi 1969). First, we operationalized attachment to parents with two measures, including *affective ties*, a three-item scale tapping how close teens feel toward their mothers and/or fathers (α= .77; responses were averaged when both parents were present in the household), and a single item of *parent affective ties*, or how close parents felt toward their teens (response values range from 1 = "Not close at all" to 6 = "Extremely close" and were averaged when both parents were present). Next, parental control was measured by (1) a three-item scale of *parental monitoring* of their teen's media and social activities (α = .61) and (2) a two-item scale of anticipated *parental reaction* to their drug use and sexual activity (α = .57), which serves as a proxy for virtual supervision. We also constructed a five-item variety index of *teen-parent involvement*, which represents the total number of conventional activities (see Appendix A) in which parents and teens have participated together over the six months prior to survey. In addition, commitment to education was operationalized by a teen's perceived *importance of school* (from 0 = "Not important at all" to 4 = "Extremely important").

A second group contains three variables of social learning (Akers 1985, 2009; Sutherland and Cressey 1970), including two measures of associations with unconventional peers from the second wave of the survey, and one measure of differential reinforcement from the first wave of the survey.[7] Specifically, respondents were first asked to think of up to five of their closest friends and to report the number of *drug-using friends W2* (who "do drugs or drink a lot of alcohol") and non-drug *deviant friends W2* (who "have been in trouble for cheating, fighting, or skipping classes"). Differential reinforcement was operationalized as a single-item measure of consistency of *parental punishment* for wrongdoing.

A third group of explanatory variables include measures of religiosity. First, *religious salience*, refers to a respondent's perceived importance of religion in life with response categories ranging from 0 = "Not important at all" to 4 = "Extremely important." Also included are two variables of religious behavior: the frequency of *service attendance* (from 0 = "Never" to 6 = "More than once a week") and *reading Bible alone* (from 1 = "Never" to 7= "Many times a day"). Next, *religious peers W2* was measured by the number of up to five "close friends" involved in a religious youth group at the second wave. We also constructed dummy variables of religious affiliation (see Steensland et al. 2000), as a proxy measuring different positions a respondent's religion takes on ascetic deviance, like drinking alcohol: *evangelical Protestant* (reference category), *mainline Protestant, black Protestant, Catholic, Jewish, Mormon, other religion, no religion*, and *religion not determinate*. In addition, given prior research showing that teen outcomes can depend to some degree on parental characteristics (Collom 2005), we included *parent religious salience* (ranging from 0 = "Not important at all" to 5 =

[6]Excluded school type categories include "Stopped going to school/dropped out," "Magnet or charter school," "Part high school and part college/postsecondary," "Only college or postsecondary," "Other," "Don't know," and "Refused." Those attending "other" schools, as well as those who either did not know or refused to answer were omitted because we have insufficient information about these students to hypothesize group differences. Those either attending college/secondary or part high school and part college/secondary were omitted because attending college has been documented as a risk factor for drinking (Prendergast 1994; White et al. 2006). The total count of excluded responses at Time 1 is 84.

[7]No measures of definitions favorable or unfavorable to substance use were available, and no item asking about antisocial behaviors of the respondent's friends was included in the first survey.

"Extremely important"), while adolescent religiosity is more likely to have significant influence than parental religiosity (Uecker 2008).

Finally, control variables of an adolescent's demographic characteristics are *age*, gender (*female* = 1), and race/ethnicity (a system of dummy variables of *black, Hispanic*, and *other race* with *white* being reference category). Other controls include region, measured by dummy variables of *Northeast, Midwest*, and *West* with *South* being the omitted category, and *household income*, which ranges from (1) "less than $10k" to (11) "more than $100k." Furthermore, because homeschool families are more likely than non-homeschool families to be two-parent households (Bielick et al. 2001:8; Princiotta et al. 2006:11), and because single-parent households have been shown to contribute to adolescent drinking and drug use (Gottfredson & Hirschi, 1990; Longest & Shanahan, 2007; Longest & Vaisey, 2008), a dummy variable for *two adult caregivers* is also included to account for any potential bias.[8]

In addition to these sociodemographic controls, we constructed theoretical controls, including variables of two major theories of delinquency other than social bonding and social learning, as alternative explanations of the relationships between school type and alcohol use: general strain and self-control theories. Specifically, we included strains most likely to cause juveniles to commit deviance (Agnew 2006): abusive peer relations (i.e., frequency of being *teased by other teenagers*; from 0 = "Never" to 4 = "Almost every day"); the failure to achieve selected goals like attractive physical appearance (i.e., *dissatisfaction with body*; from 0 = "Very happy" to 4 = "Very unhappy"); and parental rejection, indirectly measured by the number of *parental breakups* experienced by the teen, ranging from 0 to more than 10. In addition, two measures of negative emotions were included based on the parent's perception of their teen's *temper* (from 1 = "Not bad" to 3 = "Very bad") and the teen's self-reported frequency of *sadness* or depression (from 1 = "Never" to 5 = "Always"). On the other hand, a single item of low self-control (Gottfredson and Hirschi 1990) was available at Time 2, which measures a tendency to take risks, *risk-taking W2*.

Analytic strategy

Ordinary least squares (OLS) regression analysis was conducted to first estimate a baseline model of each outcome measure (i.e., drinking and drunk), in which adolescent use of alcohol at Time 2 was regressed on the key independent variables of school type, public and private school, and theoretical as well as sociodemographic controls measured at Time 1 (except for the risk-taking variable, measured at Time 2), while holding alcohol use at Time 1 constant. This control for the dependent variable's previous measure allows us to interpret the effects of explanatory variables, all measured at Time 1 (except for the peer variables), as their causal influence on alcohol use at Time 2. After establishing relationships between the two school-type variables (i.e., public and private school) and alcohol use in the baseline model (Model 1), we estimated three intermediate models by adding each group of explanatory variables at a time in the order of social bonding (Model 2), social learning (Model 3), and religiosity variables (Model 4) to see whether each group significantly explains any observed differences in alcohol use between homeschooled and non-homeschooled students. A full model (Model 5) was then estimated by regressing alcohol use on all independent variables.[9]

[8]The *two adult caregivers* dummy variable was constructed by combining responses from two survey questions, the first assessing current living arrangement and the second indicating the relationship of the parental respondent's spouse to the teen. The dummy variable thus includes households with married biological parents, unmarried parents, adoptive parents, step-parents, grandparents, foster parents, and others.

[9]Two alternative modeling techniques were also employed but not reported (complete results are available upon request). First, because the distributions of the dependent variables are skewed, we also conducted log-lin regression analyses and found that their results were generally similar to those obtained using OLS regression. Differences of note include only that the Mormon variable gained significance in Model 4 and the Mainline Protestant variable lost significance in Model 5 when regressing Drunk W2. Second, because the outcome variables are ordinal, we also performed ordinal logistic regressions. Again, results were generally similar to those obtained using OLS regression, although the teen affective ties variable was found to be significant in Model 2, as was service attendance and the Mormon variable in Model 4 and the public school variable in Model 5 when regressing Drunk W2. We decided to report OLS results given the relative ease of their interpretation, and also because solutions based on ordinal logistic regressions consistently violated the proportional odds assumption.

Results

Descriptive statistics for teens (and their parents) who responded to both Time 1 and 2 surveys are presented in Table 1. The proportion of homeschoolers represented in the sample is about 2%, which is consistent with the national estimates contemporary to the first wave of the survey (Murphy

Table 1. Descriptive Statistics of Variables Included in Analysis

Variable	*n*	Mean	SD	Range
Alcohol Use				
Drinking W1	2,486	1.67	1.10	1–7
Drinking W2	2,509	2.78	1.77	1–7
Drunk W1	2,528	1.44	.95	1–6
Drunk W2	2,508	2.16	1.42	1–6
School Type				
Homeschool	2,484	.02	.15	0, 1
Public school	2,484	.88	.32	0, 1
Private school	2,484	.09	.29	0, 1
Sociodemographics and Theoretical Controls				
Age	2,530	15.46	1.42	12.95–18.49
Female	2,530	.50	.50	0, 1
Race/Ethnicity				
White (reference)	2,514	.69	.46	0, 1
Black	2,514	.16	.37	0, 1
Hispanic	2,514	.10	.30	0, 1
Other	2,514	.05	.22	0, 1
Region				
South (reference)	2,530	.41	.49	0, 1
Northeast	2,530	.15	.36	0, 1
Midwest	2,530	.24	.43	0, 1
West	2,530	.20	.40	0, 1
Household income	2,386	6.09	2.89	1–11
Two adult caregivers	2,530	.75	.43	0, 1
Teased by other teenagers	2,523	.95	1.13	0–4
Dissatisfaction with body	2,523	1.00	1.11	0–4
Parental Breakup	2,515	.51	.87	0–10
Temper	2,509	1.46	.59	1–3
Sad	2,529	2.27	.86	1–5
Risk-taking W2	2,508	3.62	1.06	1–5
Social Bonding				
Affective ties	2,520	9.96	2.27	1–14
Parent affective ties	2,526	4.24	.78	0.5–5
Parental monitoring	2,518	10.88	2.65	3–15
Parental reaction	2,492	9.03	1.41	2–10
Teen-parent involvement	2,491	3.23	1.21	0–5
Importance of school	2,508	3.35	.79	0–4
Social Learning				
Drug-using friends W2	2,493	1.76	1.79	0–5
Deviant friends W2	2,479	1.34	1.63	0–5
Parental punishment	2,525	3.86	1.14	1–5
Religiosity				
Religious salience	2,529	3.46	1.13	1-5
Service attendance	2,526	3.22	2.19	0-6
Reading Bible alone	2,522	2.62	1.74	1-7
Religious peers W2	2,419	1.34	1.57	0-5
Parent religious salience	2,523	5.00	1.28	1-6
Religious affiliation				
Evangelical Protestant (reference)	2,530	.33	.47	0, 1
Mainline Protestant	2,530	.12	.32	0, 1
Black Protestant	2,530	.11	.32	0, 1
Catholic	2,530	.24	.43	0, 1
Jewish	2,530	.02	.13	0, 1
Mormon	2,530	.02	.15	0, 1
Other religion	2,530	.03	.16	0, 1
No religion	2,530	.12	.32	0, 1
Religion not determinate	2,530	.02	.15	0, 1

All statistics unweighted. Values are based on responses collected at Time 1 (unless noted otherwise) from respondents who participated in the second wave of the survey.

Table 2. Group Means of Dependent and Explanatory Variables by School Type

Variable	Homeschool (reference)	Public school	Private school
Alcohol Use			
Drinking W1	1.55	1.65	1.69
Drinking W2	1.89	2.78**	2.92**
Drunk W1	1.27	1.41*	1.35
Drunk W2	1.63	2.16**	2.42**
Social Bonding			
Affective ties	9.92	9.95	9.96
Parent affective ties	4.19	4.22	4.22
Parental monitoring	11.45	10.89	10.64*
Parental reaction	9.14	9.02	9.29
Teen-parent involvement	3.53	3.21	3.51
Importance of school	3.30	3.33	3.33
Social Learning			
Drug-using friends W2	1.42	1.76	1.80
Deviant friends W2	.98	1.37*	1.00
Parental punishment	3.91	3.84	3.94
Religiosity			
Religious salience	3.67	3.44	3.72
Service attendance	3.45	3.24	3.81
Reading Bible alone	3.19	2.57**	2.99
Religious peers W2	2.25	1.30**	1.68*
Parent religious salience	5.27	4.97	5.17
Religious affiliation			
Evangelical Protestant (reference)	.62	.30**	.34**
Mainline Protestant	.02	.12**	.10**
Black Protestant	.04	.11*	.06
Catholic	.08	.25**	.35**
Jewish	.00	.02**	.03*
Mormon	.09	.04	.01
Other religion	.02	.03	.02
No religion	.13	.11	.07
Religion not determinate	.00	.02**	.02

All statistics are weighted; *T*-tests compare respective means to those of homeschoolers. *$p < .05$ **$p < .01$ (two-tailed tests).

2012:9).[10] Teens who attended private school in the sample represented about 9% of the respondents, which is also close to a national estimate (Alt and Peter 2002). The sample was split evenly in terms of gender with 50% being female. A majority of the sample was white (69%), while 16% were black, another 10% Hispanic, and other races represented about 5%. Southerners were the largest regional group, with 41% of the sample, and Northeasterners were the smallest, comprising about 15% of the sample.[11] Mean household income was close to $50,000, and about three-quarters of the sample lived in two-adult households. Zero-order correlations among key variables being generally significant in the expected direction indicated that the measures of key concepts tend to have construct-validity (see Appendix B).

Table 2 presents group means by school type for the dependent and explanatory variables with *t*-tests performed to see if differences between homeschool and non-homeschooled students were significant. While group differences in alcohol use at Time 1 were not significant (except difference in getting drunk between homeschool and public-school students), homeschool students, as expected, tended to drink alcohol and get drunk less often than their public and private school counterparts. Little difference was found in terms of social bonding and social learning variables with

[10]Despite the relatively low cell count of homeschool respondents, results provided by analyses on the data appear to be quite stable. As noted in the Results section, significant group differences by school type were observed for both measures of drinking at Time 2, and these group differences were observed to be robust in subsequent multivariate analyses.

[11]Despite apparent disproportionality in regional representation, diagnostics performed by others (Smith and Denton 2005:292) confirm that the sample is nationally representative when using raw weights. Raw weights were used in conformance with instructions by Smith and Denton (2005), specifically in conjunction with controlling for region and income, and excluding the Jewish oversample.

two exceptions: homeschool students were more likely to perceive parental monitoring of their media usage and social activities than their private school peers (11.45 vs. 10.64), and homeschool teens reported fewer deviant friends than their public school counterparts at Time 2 (.98 vs. 1.37). On the other hand, homeschool students read the Bible alone more often than public school students (3.19 vs. 2.57) and had more religious peers at Time 2 than both public and private school students (2.25 vs. 1.30 and 1.68). Differences in religious affiliation were also noted, as homeschoolers were disproportionately evangelical as anticipated (62% vs. 30% and 34%). While these bivariate results are informative, testing hypotheses requires multivariate analysis, to which we now turn.

Table 3 presents unstandardized regression coefficients for drinking at Time 2. Group differences in the baseline model are consistent with Hypothesis 1a; holding prior drinking as well as socio-demographic and theoretical controls constant, public and private school students were more likely

Table 3. Estimated OLS Regression Models of Social Bonding, Social Learning, Religiosity, and Drinking Alcohol: Unstandardized Coefficients and Standard Errors (in parentheses)

Independent variable	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	−2.82**	.15	−2.51**	−1.32**	−.99
	(.45)	(.68)	(.43)	(.49)	(.64)
Age	.19**	.15**	.17**	.16**	.15**
	(.02)	(.03)	(.02)	(.02)	(.02)
Female	−.15*	−.11	.00	−.10	.02
	(.07)	(.07)	(.06)	(.07)	(.06)
Race (White = ref)					
Black	−.53**	−.56**	−.47**	−.59**	−.60**
	(.10)	(.10)	(.09)	(.15)	(.14)
Hispanic	−.36**	−.41**	−.21*	−.47**	−.39**
	(.11)	(.12)	(.10)	(.12)	(.11)
Other	−.10	−.23	−.11	−.19	−.32*
	(.14)	(.15)	(.13)	(.14)	(.13)
Region (South = ref)					
Northeast	.12	.12	.02	−.12	−.09
	(.10)	(.10)	(.09)	(.10)	(.09)
Midwest	.14	.12	.13	-.06	.00
	(.09)	(.09)	(.08)	(.09)	(.08)
West	.13	.11	.05	.05	.04
	(.09)	(.09)	(.08)	(.09)	(.09)
Household income	.06**	.06**	.04**	.05**	.05**
	(.01)	(.01)	(.01)	(.01)	(.01)
Two adult caregivers	−.28**	−.28**	−.20*	−.27**	−.21*
	(.09)	(.09)	(.08)	(.09)	(.09)
Teased by other teenagers	−.05	−.05	−.05	−.04	−.03
	(.03)	(.03)	(.03)	(.03)	(.03)
Dissatisfaction with body	−.01	−.02	.00	−.03	−.02
	(.03)	(.03)	(.03)	(.03)	(.03)
Parental breakup	.03	.03	−.01	.03	−.01
	(.04)	(.04)	(.03)	(.04)	(.03)
Temper	.01	−.04	−.02	−.01	−.06
	(.06)	(.06)	(.05)	(.06)	(.05)
Sad	.00	−.03	−.02	−.02	−.04
	(.04)	(.04)	(.04)	(.04)	(.04)
Risk-taking W2	.26**	.26**	.19**	.27**	.19**
	(.03)	(.03)	(.03)	(.03)	(.03)
School Type (Homeschool = ref)					
Public school	.67**	.64**	.59**	.45*	.42*
	(.22)	(.22)	(.19)	(.21)	(.20)
Private school	.68**	.63**	.66**	.53*	.48*
	(.24)	(.24)	(.22)	(.24)	(.22)
Drinking W1	.57**	.49**	.35**	.49**	.30**
	(.03)	(.04)	(.03)	(.03)	(.03)
Affective ties		−.02			.01
		(.02)			(.02)

(*Continued*)

Table 3. (Continued).

Independent variable	Model 1	Model 2	Model 3	Model 4	Model 5
Parent affective ties		–.05			–.06
		(.05)			(.04)
Parental monitoring		–.05**			–.01
		(.01)			(.01)
Parental reaction		–.06			.01
		(.03)			(.03)
Teen-parent involvement		–.12**			–.11**
		(.03)			(.03)
Importance of school		–.05			–.01
		(.05)			(.04)
Drug-using friends W2			.39**		.37**
			(.02)		(.02)
Deviant friends W2			.08**		.08**
			(.02)		(.02)
Parental punishment			.01		.05
			(.03)		(.03)
Religious salience				–.12**	–.10**
				(.04)	(.04)
Service attendance				.02	.00
				(.02)	(.02)
Reading Bible alone				–.05*	.02
				(.02)	(.02)
Religious peers W2				–.18**	–.10**
				(.02)	(.02)
Parent religious salience				.02	.02
				(.03)	(.03)
Religious Affiliation (Evangelical = ref)					
Mainline Protestant				.33**	.23*
				(.11)	(.11)
Black Protestant				.15	.20
				(.18)	(.16)
Catholic				.27**	.32**
				(.10)	(.09)
Jewish				–.06	.15
				(.28)	(.26)
Mormon				–.42*	–.47**
				(.18)	(.17)
Other				.12	.25
				(.21)	(.21)
None				.14	.06
				(.14)	(.13)
Not determinate				.07	.08
				(.23)	(.21)
Adjusted R^2	.26	.28	.41	.31	.44
n	2,225	2,143	2,188	2,137	2,038

All statistics weighted. *$p < .05$ **$p < .01$ (two-tailed tests).

to drink than homeschoolers (.67 and .68, respectively). Control variables tended to be associated with drinking in the expected direction. Prior drinking (.57), age (.19), and income (.06) were positively associated, whereas living in a two-adult household (–.28) was negatively related. In addition, females (–.15) and black and Hispanic respondents (–.53 and –.36) drank less often than their male and white counterparts as anticipated. Theoretical controls of general strain theory were generally not significant, whereas that of self-control theory, risk-taking at Time 2, was associated with drinking (.26) in the expected direction.

More importantly, being generally consistent with Hypothesis 2, the coefficients of public- and private-school dummy variables decreased by 37% (from .67 to .42) and 29% (from .68 to .48), respectively, when all explanatory variables were added to the baseline model, while remaining significant in the full model (Model 5). Intermediate models, however, revealed that explanatory variables have differential ability in explaining school type differences in drinking.

For instance, when controlling for social bonding variables (Model 2), coefficients for public and private school decreased to .64 and .63, respectively, as a teen's perceived parental monitoring (–.05) as well as teen-parent involvement (–.12) were found to decrease the probability of drinking, as expected (Hypothesis 2a). Also, being consistent with Hypothesis 2b, social learning variables—specifically, drug-using friends (.39) and deviant friends (.08)—partially explained group differences in drinking (Model 3); compared with social bonding variables, social learning variables explained more variance between homeschool and public school students (12% vs. 4%), but less variance between homeschool and private school students (3% vs. 7%).

However, the intermediate model of religiosity (Model 4) helped explain the most, decreasing the baseline coefficients of public and private school by 33% (from .67 to .45) and 22% (from .68 to .53), respectively. In support of Hypothesis 2c, the respondent's religious salience (–.12), reading the Bible alone (–.05), and religious friends (–.18) were found to decrease drinking, although service attendance had no significant effect on drinking (.02). Religious affiliation variables also tended to have significant effects in the anticipated direction: that is, mainline Protestants (.33) and Catholic respondents (.27) drank more often than evangelical Protestants, while Mormon respondents (–.42) drank less.

Similar results were found for the second outcome with some exceptions (see Table 4). First, public and private school students were more likely to get drunk than homeschool students as expected (Hypothesis 1b). Second, we found empirical support again for Hypothesis 2, although the

Table 4. Estimated OLS Regression Models of Social Bonding, Social Learning, Religiosity, and Getting Drunk: Unstandardized Coefficients and Standard Errors (in parentheses)

Independent variable	Model 1	Model 2	Model 3	Model 4	Model 5
Intercept	−1.82**	1.05	−1.44**	−.46	.29
	(.36)	(.54)	(.33)	(.39)	(.49)
Age	.13**	.09**	.11**	.11**	.09**
	(.02)	(.02)	(.02)	(.02)	(.02)
Female	−.15**	−.10	−.04	−.14**	−.03
	(.05)	(.05)	(.05)	(.05)	(.05)
Race (White = ref)					
Black	−.47**	−.50**	−.44**	−.54**	−.54**
	(.08)	(.08)	(.07)	(.12)	(.11)
Hispanic	−.38**	−.38**	−.29**	−.42**	−.34**
	(.09)	(.09)	(.08)	(.09)	(.09)
Other	−.26*	−.29*	−.28**	−.28*	−.37**
	(.11)	(.11)	(.10)	(.11)	(.10)
Region (South = ref)					
Northeast	.22**	.21**	.12	.08	.08
	(.08)	(.08)	(.07)	(.08)	(.07)
Midwest	.08	.06	.06	−.07	−.01
	(.07)	(.07)	(.06)	(.07)	(.06)
West	.04	−.01	−.04	−.03	−.06
	(.07)	(.07)	(.06)	(.07)	(.07)
Household income	.05**	.05**	.04**	.04**	.04**
	(.01)	(.01)	(.01)	(.01)	(.01)
Two adult caregivers	−.13	−.11	−.06	−.11	−.05
	(.07)	(.07)	(.06)	(.07)	(.07)
Teased by other teenagers	−.06*	.05*	−.06**	−.04	−.04
	(.02)	(.02)	(.02)	(.02)	(.02)
Dissatisfaction with body	.01	.00	.02	.00	.00
	(.02)	(.02)	(.02)	(.02)	(.02)
Parental breakup	.07*	.06*	.03	.06*	.03
	(.03)	(.03)	(.03)	(.03)	(.03)
Temper	−.02	−.08	−.06	−.03	−.09*
	(.05)	(.05)	(.04)	(.04)	(.04)
Sad	−.03	−.07*	−.05	−.04	−.07*
	(.03)	(.03)	(.03)	(.03)	(.03)
Risk-taking W2	.23**	.23**	.16**	.23**	.17**
	(.02)	(.02)	(.02)	(.02)	(.02)

(*Continued*)

Table 4. (Continued).

Independent variable	Model 1	Model 2	Model 3	Model 4	Model 5
School Type (Homeschool = ref)					
Public school	.40*	.38*	.32*	.22	.21
	(.17)	(.18)	(.15)	(.17)	(.15)
Private school	.56**	.52**	.50**	.45*	.37*
	(.19)	(.19)	(.17)	(.19)	(.17)
Drunk W1	.54**	.43**	.31**	.46**	.23**
	(.03)	(.03)	(.03)	(.03)	(.03)
Affective ties		−.03			.00
		(.01)			(.01)
Parent affective ties		−.01			−.02
		(.04)			(.03)
Parental monitoring		−.04**			−.01
		(.01)			(.01)
Parental reaction		−.06**			−.02
		(.02)			(.02)
Teen-parent involvement		−.08**			−.06**
		(.02)			(.02)
Importance of school		−.09*			−.04
		(.04)			(.03)
Drug-using friends W2			.34**		.32**
			(.01)		(.02)
Deviant friends W2			.08**		.07**
			(.02)		(.02)
Parental punishment			−.01		.02
			(.02)		(.02)
Religious salience				−.12**	−.09**
				(.03)	(.03)
Service attendance				.03	.01
				(.02)	(.01)
Reading Bible alone				−.06**	.00
				(.02)	(.02)
Religious peers W2				−.13**	−.06**
				(.02)	(.02)
Parent religious salience				.00	.00
				(.02)	(.02)
Religious Affiliation (Evangelical = ref)					
Mainline Protestant				.23**	.16*
				(.09)	(.08)
Black Protestant				.17	.15
				(.14)	(.13)
Catholic				.11	.15*
				(.08)	(.07)
Jewish				−.42	−.16
				(.22)	(.20)
Mormon				−.25	−.29*
				(.14)	(.13)
Other				−.06	.07
				(.16)	(.16)
None				−.01	−.04
				(.11)	(.10)
Not Determinate				.09	.15
				(.18)	(.16)
Adjusted R^2	.27	.29	.46	.32	.47
n	2,258	2,175	2,221	2,171	2,071

All statistics weighted. *$p < .05$ **$p < .01$ (two-tailed tests).

coefficient of public-homeschool difference in getting drunk not only reduced by 45% (from .40 to .22) but also became non-significant when religion variables were added to the baseline model (Model 4); the private-homeschool difference remained significant, while decreasing by 20% (from .56 to .45). Finally, adding all the non-religious variables to the religion model further reduced the coefficients by 5% (. from .22 to .21) and 18% (from .45 to .37), respectively, due mostly to social learning variables for public school students and social bonding measures for private school

students. Religion variables were found again to contribute most to the explanation of group differences between homeschool and both public and private school students, although a caution needs to be taken in interpreting their relative explanatory ability given the different number of theoretical variables employed.

Discussion and conclusions

As expected, we found homeschooled adolescents to be less likely to drink alcohol and, if they do, less likely to get drunk than their public and private high school counterparts. Also, consistent with our theoretical prediction, the observed differences were explained in part by the variables of social bonding, social learning, and, to a greater extent, religiosity. Each theory's ability in explaining group differences, however, depended on the comparison group: that is, differences between homeschool and private school students were better explained by social bonding than social learning variables. Specifically, we found that the social bonding explanation was attributable to parental monitoring and reaction to deviance rather than parent–child affective ties.

On the other hand, differences in drinking and getting drunk between homeschoolers and public school students were better explained by social learning variables. This finding affirms the well-established fact of peer influence being a key predictor of drug use among adolescents (Akers 2009), although deviant, not drug-using, peer association was likely to have contributed to the explanation, opposite to what would have been expected since the dependent variable was substance use (Akers 1985). But, it makes sense to the extent that drinking alcohol was prevalent among adolescents and thus having friends who use drugs, mostly alcohol, was less likely to explain the group difference than having friends who engaged in other forms of deviance, including cheating and fighting, and who were likely to have used alcohol and/or drugs as well.

Given that the deviant peer variables were negatively associated with measures of parent–child relationship,[12] these findings taken together suggest that homeschool students are less likely to drink partly because their parents have better control of their teen's social contacts (Ballmann 1987; Jeub 1994) than their non-homeschool counterparts. The importance of peer influence on adolescent drug use was further confirmed by religious peer association, although it was treated as a measure of religiosity rather than anti-delinquent learning. In addition, unlike previous studies that focused exclusively on deviant friends, whether drug-using or not, to explain substance use among adolescents, this study provides evidence of *differential* association as Sutherland (Sutherland and Cressey 1970) originally proposed, showing simultaneous, opposite effects of both deviant and conventional (i.e., religious) peer associations.

Next, as expected, homeschoolers were found to differ from non-homeschoolers in religiosity, which has played a critical role in the historical emergence of modern homeschooling in the United States (Gaither 2008, 2009; Lyman 1998).[13] Being consistent with homeschooling parents' desire to instill religious values (Bielick et al. 2001; Princiotta et al. 2006), homeschooled teens were more likely to have religious peers and read the Bible alone than their non-homeschool counterparts, especially those at public schools. Homeschoolers were also disproportionately evangelical Protestant (Kunzman 2009a; Murphy 2012; Ray 2004), while public and private school students were more likely to be mainline Protestant and Catholic rather than being affiliated with conservative denominations that

[12]Six of seven measures of social bonding were negatively correlated with both drug-using and deviant peer association: affective ties (–.14 and –.05), parent affective ties (–.06 and –.07), parental monitoring (–.26 and –.13), parental reaction (–.26 and –.20), teen-parent involvement (–.09 and –.13), and importance of school (–.19 and –.11), and parental punishment was negatively correlated with drug-using peer association (–.07).

[13]Notably, however, homeschool parents were no more or less religious than those of public and private school students, and parental religiosity was not found to be a significant predictor of either drinking or getting drunk. We also conducted a multinomial logistic of school type regressed on sociodemographic controls and parental religiosity, finding that the latter does not significantly predict choice of homeschool compared to either public or private school. It is reasonable to conclude, therefore, that the homeschool effect is not spurious due to parental religiosity, as the latter significantly predicts neither the choice to homeschool nor adolescent drinking use or misuse.

tend to discourage alcohol and drug use. In addition, contrary to the previous argument that the influence of religiosity on delinquency and drug use is spurious (e.g., Cochran et al. 1994; Ellis 1987), the direct effects of religious salience, religious friends, and affiliation remained significant after controlling for non-religious explanatory variables in the full model (Johnson and Jang 2011).

Although our study was intended to address a topic long neglected in criminology, its limitations need to be acknowledged for future research. First of all, while we applied major theories of delinquency to explain alcohol use among adolescents, additional and better measures of key constructs would have been desirable. For example, while a teen's perceived importance of school is a reasonable proxy for commitment to conventional goals according to Hirschi's (1969) social bonding theory, more conventional measures were either not applicable to homeschoolers (e.g., grade point average) or not available (e.g., time spent on homework). Also unavailable in our data were measures of parental alcohol use, found to be positively associated with teen drinking (Johnson and Jang 2011), and peer network (e.g., McGloin and Shermer 2009). Finally, while the small percentage of homeschool students in our nationally representative sample was anticipated, future research should replicate our study using data from a survey of oversampled homeschool students.

Despite these limitations, findings reported here have implications for potentially interesting lines of inquiry related not only to homeschool teens and their parents, but also formerly homeschooled emerging adults. For example, future patterns of drinking among homeschoolers might be affected by the changing patterns of homeschool motivation. Given that much of the protective effect of homeschooling was found to be related mainly to religiosity, and prior research has demonstrated that parental motivation affects student academic achievement (Collom 2005), it is not unreasonable to expect that motivational shifts away from ideological and toward more pedagogical concerns (Aurini and Davies 2005; Collom 2005; Murphy 2012) could also affect substance use patterns among homeschoolers.

In addition, the increased religiosity and reduced drinking of homeschooled adolescents have positive health implications in emerging adulthood. For instance, prior studies have established a link between religiosity and reduced problem drinking in college, as well as benefits associated with physical, social, emotional, and academic outcomes (Bryant and Astin 2008; Mayrl and Oeur 2009; Nelms et al. 2007; Perkins 1987). That said, transitions to emerging adulthood, and especially college, tend to be associated with declining religious behavior (though not religious belief) due to changes in social networks and the experience of greater freedom and less supervision (Uecker, Regnerus, and Vaaler 2007). As homeschoolers are increasingly attending college (Lyman 1998; Ray 2004), their adaptation to campus culture likely conditions substance use. Further study should investigate the degree to which religiosity among former homeschoolers, especially those that attend college, affects both drinking and problem drinking.

In conclusion, we believe that this study contributes to criminology by examining differences in alcohol use between homeschool and non-homeschool adolescents, which has rarely been studied based on criminological theories. As expected, homeschool teens were less likely to drink and get drunk than public and, to a lesser extent, private school students partly because they are less likely to have deviant friends than public school students, more likely to be subject to parental monitoring than private school students, and more likely to be religious in peer relations as well as beliefs and behaviors than both. However, contrary to the claims of homeschool proponents and the motivations of many homeschool families (e.g., "family reasons"), the observed difference was explained less directly by family attachment and involvement, or commitment to education.

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Appendix A. Measures as Worded on the NSYR

Alcohol Use
How often, if at all, do you drink alcohol, such as beer, wine or mixed drinks, not including religious services?
[If teen ever drinks alcohol, not including at religious services] How often, if ever, have you gotten drunk in the last year?
Social Bonding
Affective ties
First, how close or not close do you feel to your [M/F]?
Generally, how well do you and your [M/F] get along?
How often do you talk with your [M/F] about personal subjects, such as friendships, dating, or drinking?
Parent affective ties
How close do you feel to [your teen]?
How close do you think your spouse/partner feels to [your teen]?
Parental monitoring
How much (do/does) your [PARENT TYPE] monitor:
Your music, television, and movie watching.
Who you hang out with.
In general, how often (do/does) your [PARENT TYPE] know what you are actually doing when you're not at home?
Parental reaction
How upset would your [PARENT TYPE] be if (he/she/they) found out:
that you were using illegal drugs.
that you were having sex.

(*Continued*)

Appendix A. (Continued).

Teen-parent involvement
Now please tell me whether or not you have done any of the following things with [your teen] in the past SIX MONTHS. In the past 6 months, have you:
(1) visited a museum, an art gallery, or historical site together with [your teen], or not?
(2) gone to a play, concert or other show together, or not?
(3) visited a library together, or not?
(4) worked on a project such as making a craft, building or fixing something together, or not?
(5) played a game, sport, or exercised together, or not?
Importance of school
[If teen has not stopped going to school] How important or unimportant is it to you to do really well in your school-work?
Social Learning
Drug-using friends W2
[IF IDENTIFIES MORE THAN ONE FRIEND] How many, if any, of these people do drugs or drink a lot of alcohol?
[IF ONLY ONE FRIEND MENTIONED IN N:1] Is this person someone who does drugs or drinks a lot of alcohol?
Deviant friends W2
[IF IDENTIFIES MORE THAN ONE FRIEND] How many, if any, of these people have been in trouble for cheating, fighting, or skipping classes?
[IF ONLY ONE FRIEND MENTIONED IN N:1] Is this person someone who has been in trouble for cheating, fighting, or skipping classes?
Parental punishment
If your [PARENT TYPE] find(s) out you've done something wrong, how often (does he/she/do they) discipline you?
Religiosity
Religious salience
How important or unimportant is religious faith in shaping how you live your daily life?
Service attendance
About how often do you usually attend religious services there?
Praying alone
How often, if ever, do you pray by yourself alone?
Reading Bible alone
How often, if ever, do you read from [SCRIPTURES C] to yourself alone?
Religious peers W2
[IF IDENTIFIES MORE THAN ONE FRIEND] How many, if any, of these people are involved in a religious youth group?
[IF ONLY ONE FRIEND MENTIONED IN N:1] Is this person involved in a religious youth group?
Parent religious salience
How important is your religious faith in providing guidance in your own day-to-day living?
Theoretical Controls
Teased by other teenagers
In the last year, how often, if at all, did other teenagers tease or make fun of you?
Dissatisfaction with body
In general, how happy or unhappy are you with your body and physical appearance?
Parental breakup
How many times, if ever, has [your teen] experienced the breakup of the marriage or marriage-like relationship of the parents in the household where [your teen] was residing at the time?
Temper
Would you say that [your teen] has a very bad temper, a somewhat bad temper, or not a bad temper at all?
Sad
How often do you feel very sad or depressed?
Risk-taking W2
You like to take risks. (Do you strongly agree, agree, disagree, or strongly disagree?)

Appendix B. Zero-Order Correlations Between Dependent and Explanatory Variables

Variable	Drinking W2	Drunk W2
Drinking W1	.42**	.41**
Drunk W1	.37**	.42**
Social Bonding		
Affective ties	–.14**	–.15**
Parent affective ties	–.10**	–.09**
Parental monitoring	–.28**	–28**
Parental reaction	–.27**	–.27**
Teen-parent involvement	–.14**	–.12**
Importance of school	–.17**	–.19**
Social Learning		
Drug-using friends W2	.57**	.59**
Deviant friends W2	.26**	.29**
Parental punishment	–.05**	–.06**
Religiosity		
Religious salience	–.23**	–0.24**
Service attendance	–0.12**	–.10**
Reading Bible alone	–0.21**	–.24**
Religious peers W2	–0.29**	–.27**
Parent religious salience	–0.12**	–.11**
Religious affiliation		
Evangelical Protestant (reference)	–.10**	–.08**
Mainline Protestant	.09**	.09**
Black Protestant	–.12**	–.13**
Catholic	.09**	.07**
Jewish	.04*	.03
Mormon	–.09**	–.07**
Other religion	.02	–.01
No religion	.08**	.07**
Religion not determinate	.02	.03

Assumes pairwise deletion. All statistics are weighted. *$p < .05$ **$p < .01$ (two-tailed tests).