



## Homeschooled adolescents in the United States: Developmental outcomes



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### ABSTRACT

The mission of schools has broadened beyond academics to address risk behaviors such as substance use, delinquency, and socialization problems. With an estimated 3.4% of all U.S. youth being homeschooled, this study examines how U.S. homeschoolers fare on these outcomes given their lack of access to these school services. Adolescents (ages 12–17) from the 2002 through 2011 National Surveys of Drug Use and Health (NSDUH) were divided based on school status (home vs. traditional schooling) and religious affiliation (stronger vs. weaker). Controlling for demographic differences, homeschoolers with weaker religious ties were three times more likely to report being behind their expected grade level and two and a half times more likely to report no extracurricular activities in the prior year than their traditionally schooled counterparts. This group was also more likely to report lax parental attitudes toward substance use. Findings suggest homeschoolers with weaker religious ties represent an at-risk group.

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In 2012, 1.77 million U.S. youth were home-schooled, double the amount in 1999 (Bielick, Chandler, & Broughman, 2001; Noel, Stark, & Redford, 2013). Current estimates are 3.4% of 5- to 17-year-olds in the United States are homeschooled, with 53% being middle or high school age (Kunzman & Gaither, 2013; Noel et al., 2013). In addition to academics, schools have been increasingly tasked with addressing public health concerns, such as social isolation, antisocial behaviors, and substance misuse (Botvin, Griffin, & Nichols, 2006; Ryan & Warner, 2012; Seitz, Wyrick, Orsini, Milroy, & Fearnow-Kenney, 2013). What then happens to homeschoolers reared without access to these prevention and intervention services? How do they fare?

It has been difficult to answer such questions as the homeschooling literature tends to be advocacy-based, is often characterized by small or unrepresentative samples, and lacks appropriate comparison groups (Barwegen, Falciani, Putman, Reamer, & Stair, 2004; Cordner, 2012; Kunzman & Gaither, 2013; Lopez Haugen, 2006; Martin-Chang, Gould, & Meuse, 2011). Even obtaining an accurate count of the number of children being homeschooled is challenging, as not all states require homeschooling parents to register with local educational authorities (Isenberg, 2007).

Although subject to the aforementioned methodological flaws, the homeschooling literature has attempted to address some of these outcome questions. Structured homeschooling has been found to be associated with positive academic outcomes, primarily in verbal skills (Belfield, 2004; Cogan, 2010; Martin-Chang et al., 2011), although the degree to which this simply reflects greater parental involvement is unclear (Barwegen et al., 2004; Kunzman & Gaither, 2013). In contrast, socialization concerns have been harder to dispel and studies on problem behaviors are limited. Although self-report data from small, convenience samples have found no differences in interpersonal problems or peer victimization between home and

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traditionally schooled youth (Lopez Haugen, 2006; Reavis & Zakriski, 2005), research on social/extracurricular involvement has not been uniformly positive. While several authors assert that homeschoolers have as high levels of activity involvement as traditionally schooled youth (Dumas, Gates, & Schwarzer, 2010; Kunzman & Gaither, 2013; Ray, 2003), Chatham-Carpenter (1992), using a diary methodology with a small sample, found homeschoolers had fewer peer contacts and rated their friendships as less supportive. Lopez Haugen (2006), employing a convenience sample, found that while homeschooling parents rated their teens as engaging in more social activities than traditional schooling parents, these findings were reversed when the adolescents themselves were asked about their social activity involvement. Medlin's (2013) summary of the homeschooling socialization literature echoes this finding. Lastly, Hill and den Dulk (2013), using a nationally representative sample and controlling for potential confounding variables, found homeschoolers less likely to engage in volunteer and community service than traditionally schooled youth, both during adolescence and in young adulthood.

While avoiding early substance misuse and delinquency are widely acknowledged as important developmental outcomes, activity participation's value has more recently been established through studies linking it with a variety of positive academic and social outcomes, including friendship formation (Farb & Matjasko, 2012; Kort-Butler & Hagemen, 2011; Schaefer, Simpkins, Vest, & Price, 2011). As there is some indication that homeschoolers feel isolated (Jolly, Matthews, & Nester, 2013; Kunzman, 2009) and are more dependent on close, quality friendships for their emotional well-being than traditionally schooled youth (Medlin, 2013; Reavis & Zakriski, 2005), activity participation may be key in providing homeschooled adolescents opportunities to form quality peer relationships.

The mixed results regarding homeschoolers' socialization may reflect unacknowledged heterogeneity among homeschoolers. Van Galen (1988) advocated dividing homeschoolers into "ideologues" and "pedagogues". Ideologues object to the secular content of traditional education, so while maintaining its structure, they seek to modify the schooling content to reflect their beliefs. Pedagogues homeschool in order to shed the structure of formal schooling (Cai, Reeve, & Robinson, 2002; Kunzman & Gaither, 2013). Sometimes referred to as "unschooling" (Martin-Chang et al., 2011), this child-directed perspective prioritizes intrinsic motivation (Kunzman & Gaither, 2013; Parsons & Lewis, 2010). Such curricular flexibility might be attractive for parents whose children have special educational needs, either from giftedness or disability (Jolly et al., 2013; Parsons & Lewis, 2010).

This study divides homeschoolers into two groups based on degree of religious affiliation; a measure of pedagogical philosophy was not available. Consistent with prior homeschooling studies (Isenberg, 2006) religious affiliation was operationalized as frequency of religious service attendance. Homeschoolers with stronger and weaker religious ties were compared to two analogous groups of traditionally schooled adolescents on delinquency, substance misuse, being behind expected grade level, and failing to engage in social or extracurricular activities. It was hypothesized that religious traditionally schooled youth would have the lowest level of delinquent and substance problems, while less religious homeschoolers the highest levels, given findings showing both religious ties and school connectedness associated with less delinquency and substance misuse (Li et al., 2011; Maddox & Prinz, 2003; Salas-Wright, Vaughn, Hodge, & Perron, 2012). It was also postulated that only less religious homeschoolers would show academic delays, given it is thought that this group is less likely to have the *structured* learning experience associated with positive academic outcomes in homeschoolers (Martin-Chang et al., 2011). Finally, as the school system is a source of social/extracurricular activities, it was hypothesized that both homeschooled groups would report less activity participation compared to their traditionally schooled peers.

## Methods

### Sample

The National Survey on Drug Use and Health (NSDUH) is a yearly, nationally representative survey of U.S. household residents ages 12 and older (Substance Abuse and Mental Health Administration, 2012). Response rates for the 2002–2011 NSDUH ranged from 68.9% to 76.8% (Bowman et al., 2005; Butler et al., 2012; Caviness et al., 2009; Cirella et al., 2010).

The prior decade of available data (survey years 2002 through 2011) were combined and a subsample of 12- to 17-year-olds extracted ( $n = 182,351$ ). This subsample was 51.1% male, with a mean age of 14.54 ( $SD = 1.69$ ). The majority were White (61.1%), with 16.4% identified as Hispanic, 13.8% as African-American, and 8.7% as other. Yearly family income exceeded \$50,000 for 48.8% of the sample, although a sizeable minority (28.9%) earned less than \$30,000. Two parent families were the most common configuration (67.9%); 23.4% of families were headed by mothers only. Most families had two children under the age of 18 (37.6%); however, in 31.0% of the families the respondent was the only child.

### Measures

#### Demographics

Adolescents were asked their sex, age, ethnicity, and what they perceived their current grade level to be. Family income, which parent(s) resided in the home, and number of children in the home under age 18 also were assessed.

#### Religion

Frequency of religious service attendance was measured by asking, "During the past 12 months, how many times did you attend religious services?" Responses were dichotomously divided into less than 25 times (weaker religious affiliation) or 25 times or more in the prior year (stronger religious affiliation). Participants also were asked to rate from *strongly agree* to

*strongly disagree* how important their religious beliefs were to them, how much their religious beliefs influenced their decisions, and how important it was that their friends share their religious beliefs.

#### Activities

Participants were asked “During the past 12 months, in how many different kinds of school-based activities, such as team sports, cheerleading, choir, band, student government, or clubs, have you participated”? Responses were coded as *none*, *one*, *two*, or *3 or more*. Similarly structured questions were asked for participation in church or faith-based (i.e., clubs, youth groups, Saturday or Sunday school, prayer groups, youth trips, service or volunteer activities), community-based (i.e., volunteer activities, sports, clubs, groups), and other activities (i.e., music, dance, or karate lessons).

#### Delinquency

Participants were asked if they had ever been arrested or booked for breaking the law, with booked including being taken into custody and processed even if subsequently released.

#### Substance misuse

Two substance summary variables were created. A participant was coded as having a substance disorder if they had either alcohol or illicit drug abuse or had nicotine, alcohol or illicit drug dependence. Nicotine dependence was defined as either (a) current smokers who reported smoking within 30 min of awakening, or (b) a score of 2.75 or above on the Nicotine Dependence Syndrome Scale (Shiffman, Waters, & Hickcox, 2004). Alcohol abuse and dependence were assessed using questions corresponding to the *DSM-IV*'s criteria for these disorders (American Psychiatric Association, 2000); the same was true for illicit drug abuse and dependence. These indices were combined into a dichotomous measure (presence of at least one substance disorder vs. not).

A second substance summary variable tapped adolescents' report of how their parents would react if the teen was misusing substances. Specifically, adolescents were asked how their parents would respond to them smoking a pack or more of cigarettes daily, having one or two alcoholic drinks daily, or smoking marijuana once or twice per month. Responses were rated from *strongly approve* to *strongly disapprove*, but since answers other than *strongly disapprove* were infrequent (<15%), responses were dichotomously recoded (*strongly disapprove* vs. *other*). The three parental attitude items then were combined into a single dichotomous score (parent failed to strongly disapprove of at least one of these behaviors vs. not). Prior research has found perceived lax parental substance attitudes to be associated with later teen substance misuse (Donovan, 2004; Malmberg et al., 2012; Sargent & Dalton, 2001).

#### Substance prevention services

Respondents were asked if in the prior year they had attended a substance prevention program in school, participated in a substance prevention program outside of school, seen substance prevention messages in the community (i.e., pamphlets, posters, television, radio), or had talked to their parents regarding the dangers of substance misuse. Youth who answered *yes* to at least one of the above questions was grouped as having received substance prevention in the prior year while those who responded negatively to all questions was considered not to have received such prevention services.

#### Schooling

Subjects were initially asked, “Have you attended any type of school at any time during the past 12 months?” Respondents who answered *yes* were classified as traditionally schooled. Those youth who either stated they did not know or who answered negatively were asked if they had “...been homeschooled at any time during the prior 12 months?” If respondents answered *yes* to this second question they were classified as homeschooled. Respondents who denied either being in school or homeschooled were not included in this study.

#### Procedures

A trained interviewer solicited parental consent and adolescent assent. The adolescent's privacy was maximized by interviewing the teen separately and by allowing them to mark responses directly on a portable computer. Participants were reimbursed \$30 for being interviewed. The study was conducted in accordance with guidelines of the U.S. Department of Health and Human Services Office of Human Research Protections.

## Results

In total 0.6% of the sample ( $n = 1094$ ) reported being homeschooled. Homeschooled youth were further subdivided into groups with stronger ( $n = 658$ ) and weaker religious affiliations ( $n = 436$ ). Traditionally schooled students also were divided into stronger ( $n = 111,673$ ) and weaker ( $n = 52,721$ ) religious groups.

#### Religious beliefs

As religious service attendance could be primarily driven by parental religious beliefs, teens were queried regarding the centrality of religious beliefs in their lives. Homeschoolers with stronger religious ties were three times more likely to

strongly agree that their beliefs were very important in their lives compared to homeschoolers with weaker religious ties (78.9% vs. 25.8%,  $\chi^2(9) = 29687.96$ ,  $p < .001$ ,  $V = .246$ ), that their beliefs influenced their decisions (69.7% vs. 20.9%,  $\chi^2(9) = 26632.73$ ,  $p < .001$ ,  $V = .233$ ), and that it was important that their friends shared their beliefs (40.7% vs. 10.7%,  $\chi^2(9) = 15382.80$ ,  $p < .001$ ,  $V = .178$ ). A similar relative relationship existed between the stronger and weaker religious affiliated traditionally schooled youth on importance of beliefs (60.5% vs. 20.2%), influence of beliefs (47.9% vs. 15.1%), and importance of friends sharing beliefs (15.7% vs. 5.1%).

### Demographic differences

Compared to those with weaker religious affiliation, religious teens were more likely to be White, female, and come from two-parent families earning at least \$30,000 yearly (Table 1). On the other hand, school status appeared more closely associated with number of children, with 55.0% of religious homeschooling families have three or more children. Religiously oriented homeschoolers were also the youngest of the three groups by half a year.

The groups differed on all demographic variables and, with the exception of number of children and lack of social/extracurricular participation, all demographic variables were significantly correlated with the dependent variables. Consequently, logistic regression was used to assess group differences, with demographics being entered in step one and group membership in step two. Adjusted odds ratios are reported.

### Delinquency

The overall logistic regression model predicting delinquency was significant,  $\chi^2(11) = 7262.33$ ,  $p < .001$ . Demographic variables accounted for 10.3% of the variance, with group contributing an additional 1.3% of variance above that of the demographics (total Nagelkerke  $R^2 = .116$ ) (Table 2).

Males were nearly twice as likely ( $OR = 1.9$ ) as females to have been arrested or booked, controlling for all other variables. Strong religious affiliation appeared to be a buffer against delinquency, with both religious groups being 70% ( $OR = 0.3$ ) less likely to have been arrested or booked compared to the less religious traditionally schooled reference group, controlling for all other variables in the equation. Bivariate analyses indicated that religious homeschoolers were less likely to report being booked or arrested (1.6%) than religious traditionally schooled students (3.3%) or less religious homeschoolers (9.7%),  $\chi^2(3) = 1273.96$ ,  $p < .001$ ,  $V = .089$ . Contrary to expectation, no statistically significant difference was found between less religious homeschoolers and the reference group.

### Substance disorders

The overall logistic regression model was significant ( $\chi^2(10) = 12863.19$ ,  $p < .001$ ), with demographic variables accounting for 13.5% the variance in substance disorders and group membership a unique 1.7% of the variance over and above that (total Nagelkerke  $R^2 = .152$ ).

**Table 1**  
Demographic differences among stronger and weaker religiously affiliation traditional and homeschooled adolescents ( $n = 165,488$ ).

	Weaker religious affiliation traditional school ( $n = 111,673$ )	Stronger religious affiliation traditional school ( $n = 52,721$ )	Weaker religious affiliation home-school ( $n = 658$ )	Stronger religious affiliation home-school ( $n = 436$ )	$F$ , $\chi^2$	$p$	$ES$
Age (years) <sup>a</sup>	14.63 <sub>a</sub> ( $SD = 1.69$ )	14.59 <sub>a</sub> ( $SD = 1.66$ )	14.64 <sub>a</sub> ( $SD = 1.80$ )	14.02 <sub>b</sub> ( $SD = 1.65$ )	$F = 53.37$	$<.001$	$\eta_p^2 = .001$
Income							
<30K	31.2%	18.6%	46.2%	20.4%	$\chi^2 = 2983.25$	$<.001$	$V = .134$
30K+	68.8%	81.4%	53.8%	79.6%			
Ethnicity							
White	60.2%	69.1%	57.6%	81.9%	$\chi^2 = 1468.97$	$<.001$	$V = .054$
African-American	13.4%	12.1%	12.5%	4.6%			
Hispanic	17.2%	11.7%	22.3%	8.3%			
Other	9.2%	7.1%	7.6%	5.3%			
Sex							
Male	52.9%	47.3%	57.0%	44.5%	$\chi^2 = 460.94$	$<.001$	$V = .053$
Female	47.1%	52.7%	43.0%	55.5%			
Two parent home <sup>b</sup>							
Yes	64.6%	77.4%	63.5%	90.1%	$\chi^2 = 2828.89$	$<.001$	$V = .131$
No	35.4%	22.6%	36.5%	9.9%			
#Children <18 years							
1–2	70.4%	67.7%	59.6%	45.0%	$\chi^2 = 271.78$	$<.001$	$V = .041$
3+	29.6%	32.3%	40.4%	55.0%			

<sup>a</sup> Groups with different subscripts are statistically different from one another.

<sup>b</sup>  $n = 165,325$ .

**Table 2**  
Demographic variables and group membership as predictors of developmental outcomes.

Predictor	Delinquency <sup>a</sup>			Substance Disorders <sup>b</sup>			Behind Grade Level <sup>c</sup>			Social/Extracurricular Isolation <sup>d</sup>		
	OR	95% CI	p	OR	95% CI	p	OR	95% CI	p	OR	95% CI	p
Age	1.463	1.443–1.483	<.001	1.677	1.658–1.696	<.001	1.211	1.191–1.230	<.001	1.185	1.171–1.199	<.001
Male <sup>e</sup>	1.905	1.825–1.988	<.001	0.897	0.868–0.927	<.001	1.773	1.680–1.871	<.001	1.329	1.278–1.382	<.001
Ethnicity <sup>f</sup>												
African-American	1.336	1.260–1.416	<.001	0.403	0.379–0.428	<.001	1.794	1.675–1.922	<.001	0.727	0.682–0.775	<.001
Hispanic	1.159	1.094–1.228	<.001	0.739	0.705–0.775	<.001	1.277	1.190–1.371	<.001	1.267	1.205–1.332	<.001
Other	1.271	1.184–1.365	<.001	0.844	0.795–0.895	<.001	1.015	0.918–1.123	.764	0.926	0.863–0.995	.035
Lower income <sup>g</sup>	1.541	1.470–1.615	<.001	1.235	1.188–1.285	<.001	2.687	2.534–2.850	<.001	1.599	1.530–1.671	<.001
Two-parent household <sup>h</sup>	0.606	0.579–0.634	<.001	0.673	0.649–0.698	<.001	0.815	0.769–0.864	<.001	0.787	0.754–0.821	<.001
≥3 children <sup>i</sup>	1.136	1.086–1.190	<.001	— <sup>k</sup>	— <sup>k</sup>	— <sup>k</sup>	1.344	1.272–1.420	<.001	— <sup>l</sup>	— <sup>l</sup>	— <sup>l</sup>
Group <sup>j</sup>												
Traditional – stronger religion	0.475	0.450–0.501	<.001	0.465	0.447–0.485	<.001	0.512	0.477–0.548	<.001	0.142	0.131–0.154	<.001
Homeschool – stronger religion	0.312	0.147–0.662	.002	0.268	0.153–0.468	<.001	2.042	1.362–3.060	.001	0.378	0.217–0.658	.001
Homeschool – weaker religion	1.151	0.873–1.516	.318	1.186	0.050–1.482	.132	3.000	2.335–3.854	<.001	2.588	2.145–3.123	<.001

<sup>a</sup>  $n = 162,443$ .

<sup>b</sup>  $n = 165,325$ .

<sup>c</sup>  $n = 163,398$ .

<sup>d</sup>  $n = 163,996$ .

<sup>e</sup> Reference group – Females.

<sup>f</sup> Reference group – Whites.

<sup>g</sup> Reference group – Income  $\geq 30K$ .

<sup>h</sup> Reference group – Mother only, father only, or neither parent in the home.

<sup>i</sup> Reference group – One or two children.

<sup>j</sup> Reference group – Traditional school – weaker religious affiliation.

<sup>k</sup> Variable not entered into final model.

<sup>l</sup> Variable not entered into model initially.

As with delinquency, having strong religious ties was a buffer against having a substance disorder, with the two non-religious groups not being significantly different from one another (Table 2). Again, bivariate analyses revealed religious homeschoolers were the least likely to have a substance disorder (3.0%), as compared to 6.1% of religious traditionally schooled and 15.8% of less religious homeschoolers,  $\chi^2(3) = 1755.65$ ,  $p < .001$ ,  $V = .103$ .

Substance problems may not have yet progressed to the point of meeting *DSM-IV* criteria for abuse or dependence, particularly in light of the sample's age. Consequently, the groups also were compared on the adolescent's report of how lax the parent's attitude towards substance misuse was, an established correlate of future substance misuse (Donovan, 2004; Malmberg et al., 2012; Sargent & Dalton, 2001). Over one-third (34.7%) of all homeschoolers with weaker religious ties reported that their parents would not strongly disapprove if they were to engage in at least one substance misuse behaviors; in contrast, such lax parental substance attitudes were seen less frequently in the religious traditionally schooled (8.5%) and religious homeschooled (6.5%) groups,  $\chi^2(3) = 4073.57$ ,  $p < .001$ ,  $V = .158$ .

Lastly, the groups differed with whether they reported receiving any substance preventative services in the prior year,  $\chi^2(3) = 981.88$ ,  $p < .001$ ,  $V = .077$ . More homeschoolers, either with weaker (18.2%) or stronger (11.4%) religious ties, denied having received any substance prevention message in the prior year than was the case for more (2.5%) and less religiously (5.3%) inclined traditionally schooled teens.

### Reporting being behind grade level

For the purpose of this study, being behind in school was defined as being two or more years below expected grade level. Expected grade level was the grade in which the majority of the participant's same age peers reported they were currently enrolled. Hence, this variable signifies if the adolescent's self-reported grade level is two or more years behind the grade level reported by his or her same age peers. The overall logistic regression model was significant,  $\chi^2(11) = 4361.68$ ,  $p < .001$ . While the demographic variables accounted for 8.5% of the variance, group membership explained an additional 1.1% of variance over that already accounted for by the demographic variables (total Nagelkerke  $R^2 = .096$ ).

While having a lower yearly family income ( $< \$30,000$ ) was a significant predictor of the teen reporting being behind grade ( $OR = 2.7$ ), so was school status (Table 2). That the less religious homeschoolers were three times ( $OR = 3.0$ ) more likely to report being behind expected grade level compared to the reference group was consistent with hypotheses. That religious homeschoolers were twice ( $OR = 2.0$ ) as likely to report being behind expected grade level compared to the reference group was not. Having stronger religious ties appeared to have only had a modest buffering effect on self-reported grade level among homeschoolers.



### Extracurricular activity participation

The dependent variable for this logistic regression was the adolescent reporting having participated in no extracurricular activities during the prior 12 months (yes or no). The overall model was significant,  $\chi^2(10) = 7110.27$ ,  $p < .001$ . While demographics accounted for approximately 4.4% of the variance in failure to participate in extracurricular activities, group membership uniquely explained an additional 6.2% of the variance over and above the demographics (total Nagelkerke  $R^2 = .106$ ). Compared to youth with a similar weaker level of religious affiliation, less religious homeschoolers were two and a half times more likely to report that they had not engaged in any extracurricular activities in the prior 12 months ( $OR = 2.6$ ), with 23.4% of this group being isolated in this way (Table 2). Contrary to expectation, religious homeschoolers were approximately 60% less likely to report such activity isolation than the reference group, controlling for demographics ( $OR = 0.4$ ).

In addition to presence or absence of activities, participation can also be measured via *breadth* of activity source. Not surprisingly over 90% of the youth with stronger religious affiliations reported being involved in faith-based activities, compared to approximately 50% of the youth with weaker religious affiliations. Where the two faith-based groups differed was in the percentage of youth for whom faith-based activities was the *only* source of activity they engaged in during the last year. One in five (20.7%) religiously affiliated homeschoolers reported that faith or church was the only source the activities they engaged in the prior year, while 3.4% of religious traditionally schooled adolescents reported all their activities emanated from a faith or church source.

Interestingly, homeschooled youth reported noteworthy involvement in school-based activities in the last year (55.0% of stronger and 51.2% of weaker religiously affiliated homeschoolers); in contrast, 89.8% of stronger and 79.2% of weaker religiously affiliated traditionally schooled youth were involved in school-based activities during the last year.

### Discussion

In their recent review of the literature Kunzman and Gaither (2013, p. 13) noted that the distinction between pedagogical and ideological homeschoolers has remained “remarkably resilient”. This study suggests that this distinction continues to be helpful in understanding the social and academic needs of subgroups of homeschoolers. Although this study does not directly assess pedagogical philosophy among the less-religiously affiliated homeschoolers, linking the findings to Van Galen’s dichotomy may be productive in attempting to understand the data.

Among homeschooling “ideologues” religion plays a significant social role, with 40.7% responding it is important for friends to share their religious beliefs and 20.7% reporting the source of all their activities during the prior year were faith or church-based. Despite some lack of variability in source of activities, religious homeschoolers showed many strengths in terms of outcomes, being the least likely to be delinquent or substance disordered of the four groups. Consistent with prior literature (Salas-Wright et al., 2012), religious affiliation appeared to serve as a buffer against these externalizing behaviors. This group, however, did show difficulties with self-reported grade level, being twice as likely to report their current grade level to be two or more years behind the expected grade level for their age. This conflicts with prior studies (Belfield, 2004; Cogan, 2010; Martin-Chang et al., 2011) which have found homeschoolers to have better academic outcomes than traditionally schooled students. This discrepancy could reflect the inexact nature of the academic outcome variable used in this study, which was based on adolescent self-report. On the other hand, some have questioned prior findings given concerns regarding sample representativeness (Martin-Chang et al., 2011). Nationally representative studies using objective assessments of academic outcomes are needed.

Less religious homeschoolers, the group that may be more analogous to Van Galen’s “pedagogues,” appeared to struggle more than their religious counterparts. While not more likely to be delinquent or have a substance disorder than traditionally schooled students with similar levels of religious affiliation, over a third of less religious homeschoolers (34.7%) reported their parents had lax attitudes towards them misusing substances and 18.2% denied having received any substance prevention messages in the prior year. Previous research has found both of these factors to be associated increased risk of future substance misuse (Donovan, 2004; Faggiano, Vigna-Taglianti, Versino, Zambon, & Borraccino, 2008; Malmberg et al., 2012; Sargent & Dalton, 2001).

In addition to future risk of substance issues, 23.4% of less religious homeschoolers had not engaged in any extracurricular activities during the prior year, raising current concerns of social isolation. Lastly, 13.6% of this group reported their grade level to be two or more years behind that reported by similarly aged peers. With respect to this last finding, less religious homeschooling families could be more likely to use an “unschooling” approach, thereby making grade level less meaningful for this particular group. However, both homeschooling groups reported being behind expected grade level, though to different degrees. It is also possible that the difficulty could lie with homeschooling itself or it could be that parents who chose to homeschool do so because the school system has failed to meet their child’s educational needs (Parsons & Lewis, 2010). If the latter is true, such children may well be struggling academically before homeschooling commences. Unfortunately, information regarding participants’ prior educational progress and/or special educational needs was not available with the NSDUH.

### Limitations

Another limitation arises from the NSDUH’s method of classifying homeschooled youth. While retaining the same question over time permits consolidation of data across the years and thereby increases statistical power, it can also result in

the survey instrument not reflecting recent changes in the phenomenon. While the NSDUH's questions continue to assume a dichotomy between homeschool and traditionally schooled youth, mixed or hybrid models of schooling have risen in popularity recently. These hybrids, ranging from cooperatives to virtual online charter schools, blur the boundary between home and traditional schooling (Brady, Umpstead, & Eckes, 2010; Kunzman & Gaither, 2013). Future work should both speak of and assess the full continuum of schooling options (Murphy, 2012) in order to best represent the current schooling landscape.

Although a nationally representative sample, the number of homeschoolers in the NSDUH surveys was less than population estimates suggest. This could reflect the phrasing of the schooling question in the NSDUH. In evaluating how much less, it should be remembered that NSDUH data used extends back to 2002, when the number of homeschoolers was not much more than half of its current amount (USDOE, 2008). Alternatively, it is possible given the recent increase in hybrid models some individuals schooled in such mixed models responded "yes" when initially asked if they attended any type of school and consequently were not asked if they also considered themselves homeschooled. The fact that, given the sequence of the questions, not all youth were asked if they considered themselves homeschooled represents a limitation of the study. However, even taking these issues into account, the more limited numbers of homeschooler may simply reflect what Kunzman and Gaither (2013) describe as reluctance among homeschoolers to participate in government sponsored surveys. Given the NSDUH is not represented to participants as a study on homeschooling and, as noted on a national homeschooling website (Estrada, 2013), few of its questions are about schooling, it is possible that the NSDUH elicited less defensiveness than would be the case with a study more clearly focused on homeschooling. However, it is also possible that homeschoolers' general wariness of federally sponsored surveys inhibited their participation, irrespective of the survey's content (Kunzman & Gaither, 2013), thus raising questions about the self-selective nature of those who chose to participate. This issue highlights the difficulty procuring large representative samples of homeschooled youth for study.

The fact that the NSDUH's focus is on substance use, versus schooling, also represents a limitation as the survey provides limited details on outcomes outside of substance related ones. Additionally, the NSDUH's response options are often categorical or recoded as such in their public-access database. Although used to facilitate increased confidentiality, this strategy precludes the use of certain analyses and may obscure more nuanced differences, such as whether groups' means differ within a given range.

Lastly, that the sample is specific to the U.S. limits the generalizability of its findings. While religious affiliation may figure importantly among U.S. homeschoolers, studies of homeschooling in other nations emphasize the importance of other factors (i.e., how dispersed the population is, the society's "e-maturity", how controlling the central government is seen as, the importance the culture places on individualism and family, etc.) (Austin & Hunter, 2013; Kunzman & Gaither, 2013).

## Conclusion

While directionality of the relationships between outcome variable and homeschooling cannot be ascertained, these results indicate that less religious homeschoolers are experiencing academic and social difficulties, as well as some suggestion of increased risk for later substance misuse. This group would benefit from services to help assist with these difficulties, whether that help be provided via an institution such as school or within the family structure remains to be determined.

Currently there exists controversy in the U.S. over what school-based services homeschoolers should have access to (Longman, 2012), with both the general public and homeschoolers expressing conflicted feelings over the issue (Dao, 2005). Until recently this argument has tended to center on athletics; these results suggest there may be merit in broadening this discussion beyond athletics to consider if homeschoolers should access the array of socio-emotional and academic preventive and intervention services U.S. schools typically provide.

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