Drinking Behavior and Sources of Alcohol: Differences Between Native American and White Youths*

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ABSTRACT. Objective: We investigated drinking behavior and sources of alcohol among Native American and White youths, as well as how underage drinking behavior and sources of alcohol may be related to environmental factors. **Method:** Survey data from a sample of 18,916 youths (8th, 10th, and 12th grades) from Montana were analyzed using hierarchical linear modeling. Survey data were supplemented with county-level economic and census data. **Results:** Native American youths were more likely than White youths to report drinking and heavy episodic drinking and initiate drinking at a younger age. Native Americans were less likely than Whites to get alcohol from home or from someone younger than age 21 but were more likely to get it from other social sources or through theft from a store. Living in a county with more Native Americans was inversely related to access to alcohol

for both White and Native American youths, as well as reduced lifetime, 30-day, and heavy episodic drinking. Living in a county with more single-parent households was positively related to lifetime drinking, 30-day drinking, heavy episodic drinking, and increased access to alcohol through someone younger than age 21 or a stranger. Median income was negatively related to lifetime drinking and ease of access to alcohol and was positively related to accessing alcohol from home without permission, theft, or purchase with a fake ID. **Conclusions:** Because Native American and White youths have different drinking patterns and obtain alcohol from different sources, strategies to prevent alcohol problems in these groups should take these differences into consideration. (*J. Stud. Alcohol Drugs*, 72, 53-60, 2011)

DRINKING BY YOUNG PEOPLE IS ASSOCIATED with an array of problems. Each year, as many as 5,000 youths younger than the age of 21 in the United States die as a result of drinking-related motor vehicle crashes, homicides, suicide, and other injuries, such as falls, burns, and drowning (Hingson and Kenkel, 2004; National Highway Traffic Safety Administration, 2007; National Institute on Alcoholism and Alcohol Abuse, 2007). Heavy episodic drinking by youths may be particularly closely associated with problem outcomes (Wechsler et al., 1994). Early onset of drinking is also associated with an increased likelihood of a broad range of negative consequences later in life, such as dependence and abuse, drinking and driving, unwanted or unplanned sex, unintended pregnancy, sexually transmitted infections, violence, and unintentional injury (e.g., Hingson and Kenkel, 2004). Overall, the estimated costs of underage drinking in the United States reach \$61.9 billion annually (Miller et al., 2006).

Heavy drinking has especially been a public health concern for Native American youths. Although considerable het-

erogeneity of drinking patterns among Native Americans has been reported (Beauvais, 1998; Caetano et al., 1998), Native American youths are typically found to start using alcohol at younger ages than other youths and to drink more and more frequently (Bachman et al., 1991; Beauvais, 1996; Spear et al., 2005). The Native American population experiences greater negative health consequences because of alcohol use and misuse, including chronic liver disease, alcohol-related automobile crashes, suicide, homicide, and fetal alcohol syndrome (Beauvais, 1998). Given these statistics, it is important to better understand the risk factors related to drinking among Native American youths to develop more effective prevention interventions.

Availability of alcohol has been identified as a key environmental risk factor associated with youth drinking and drinking-related problems (Dent et al., 2005; Paschall et al., 2007). Thus, drinking and drinking problems have been found to be higher in communities where availability is higher and enforcement of minor-in-possession laws is less strict (Dent et al., 2005; Paschall et al., 2007; Treno et al., 2003). We know that individual characteristics, such as age, play a role in where youths access alcohol. For example, older adolescents are more likely than younger adolescents to obtain alcohol from parties, friends, and adult purchasers (Harrison et al., 2000; Schwartz et al., 1998; Wagenaar et al., 1993, 1996; Williams and Mulhall, 2005). Overall, commercial sources are less frequently used to access alcohol than social sources for alcohol but become more important with age (Wagenaar et al., 1996). Conversely, family sources are used more fre-

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quently by younger adolescents and become less important with age (Wagenaar et al., 1996). In general, older adolescents are less likely than younger adolescents to drink at home or in the presence of parents or other adults (Mayer et al., 1998). However, the relationship between how alcohol is accessed and other individual characteristics—such as race, ethnicity, and gender—has not been explored in detail.

Studies have also investigated how community environmental factors relate to youth access to alcohol and to their drinking behaviors. For example, proximity of alcohol outlets and outlet density have been related to youth drinking and drinking problems (e.g., Chen et al., 2010; Huckle et al., 2008; Treno et al., 2003; Truong and Sturm, 2009) and to the likelihood of using social and commercial sources of alcohol (Paschall et al., 2007). Likewise, neighborhood characteristics—such as residential instability, percentage in poverty, and overall disadvantage—have been found to be related to increased adolescent drug and alcohol use (Buu et al., 2009; Duncan et al., 2002; Winstanley et al., 2008).

Few studies, however, have specifically examined racial and ethnic differences related to where and how youths access alcohol. One study found that African American, Hispanic/Latino(a), Asian, and Native American youths were less likely to obtain alcohol from social sources than their White counterparts (Harrison et al., 2000). Another study conducted in Wisconsin found that youths accessed alcohol primarily through social sources, but the specific social sources differed for Native American and White youths (Friese and Grube, 2008). Native American youths were more likely to have obtained alcohol from an adult or from someone younger than age 21 than were White youths, whereas White youths were more likely to have obtained alcohol from their parents. Native American and White youths, however, did not differ in access to alcohol from other social sources.

The purpose of this current study is to examine differences in drinking behaviors and sources of alcohol among Native American and White youths and to explore individual and environmental factors that are related to drinking and access to alcohol for these groups. The present study fills a gap in our knowledge by investigating whether Native American and White youths differ in their drinking behaviors and where they obtain alcohol using a large survey sample of adolescents from Montana. Going beyond previous research, the present study considers not only differences in drinking patterns and in how Native American and White youths access alcohol but also environmental factors (e.g., alcohol-outlet density, population characteristics, and community disorganization) that may be related to youth access to alcohol and to drinking. Such information is crucial to understanding how youths in different racial and ethnic groups obtain alcohol and to designing effective policies and environmental interventions to reduce access to alcohol and ultimately drinking and drinking problems among youths.

Method

Survey data

The survey data were collected using the 2008 Prevention Needs Assessment Community Student Survey, which is conducted by the Montana Department of Public Health and Human Services, Addictive and Mental Disorders Division. This voluntary and anonymous survey is administered every other year with youths in Grades 8, 10, and 12. The survey is designed to measure adolescent substance use, antisocial behavior, and risk and protective factors. In 2008, data were collected using self-administered surveys given by teachers and other school staff in 193 of 338 eligible schools. Of all eligible students in Grades 8, 10, and 12 across all schools, 66% participated in the 2008 survey. School boards were responsible for deciding whether to require active or passive consent from parents.

Sample

Of the 21,225 youths who participated in the 2008 survey, 18,916 had complete data on the variables of interest and reported being either Native American or White. Of the 18,916 respondents who comprised the analytic sample, 7.5% ($n = 1,416$) were Native American and 92.5% ($n = 17,500$) were White. Because this study focused on a comparison of Native American and White youths' drinking behavior and alcohol sources, multiracial youths were excluded from the analysis ($n = 1,201$), as were youths who were neither Native American nor White ($n = 652$). The Native American youths ($M = 15.3$ years, $SD = 1.77$) in the sample did not differ in age from White youths ($M = 15.4$ years, $SD = 1.74$). Overall, 49.9% of the sample was female. The gender distribution differed slightly between Native American youth (50.2% female) and White youths (49.8% female). This difference, however, was not statistically significant. Youths who identified themselves as Native American were not asked about their tribal affiliations. Youths were also not asked whether they resided on tribal land. However, seven counties included in the study overlap to a large extent with reservation land.

Measures

Background variables. Background variables included gender (0 = female, 1 = male), age, and race (1 = Native American, 0 = White).

Drinking. Lifetime drinking was ascertained by asking respondents on how many occasions they had ever had more than just a few sips of any alcoholic beverage (0–40 or more). Drinking in the previous month was measured by asking on how many occasions during the last 30 days they had beer, wine, or distilled spirits to drink (0–40 or more). Lifetime drinking and 30-day drinking were re-coded to

response category midpoints. Heavy episodic drinking was measured by asking how many times in the last 2 weeks the youths had five or more alcoholic drinks in a row (0-10 or more times). Heavy episodic drinking categories were re-coded to category midpoints. Respondents were also asked how old they were the first time they had more than a sip or two of beer, wine, or distilled spirits and how old they were when they began drinking alcoholic beverages regularly, that is, at least once or twice a month (age 9 or ages 10-17 or older).

Ease of access to alcohol. Perceived ease of access to alcohol was measured by asking respondents: "If you wanted to get some beer, wine, or hard liquor, how easy would it be for you to get some?" Response categories were *very hard* (1), *sort of hard* (2), *sort of easy* (3), and *very easy* (4).

Sources of alcohol. To obtain information about sources of alcohol, drinkers were asked where they usually obtained alcohol in the last year ("If you drank alcohol and not just a sip or taste in the past year, how did you usually get it? Choose all that apply"). This question required youths to select responses from a list of sources (bought it with a fake identification [ID], bought it without a fake ID, someone I know age 21 or older, someone I know younger than age 21, brother or sister, home with parents' permission, home without parents' permission, another relative, stranger, took it from store or shop). Use of each source was coded as a dichotomous variable (1 = *yes*, 0 = *no*).

County-level variables. To account for environmental factors, four county-level variables were included in the analyses: density of alcohol outlets, median income, percentage of single-parent households, and percentage of Native American population. Outlet density was based on the average yearly number of licensed retail alcohol outlets in 2001 (Montana Department of Revenue, 2001) per square mile. Median income was based on 2007 U.S. census estimates, and was re-coded as income in \$10,000 increments (U.S. Census Bureau, 2007). The percentage of single-parent family households was based on data reported by the Montana Department of Commerce (2000b). The percentage Native American population by county was based on 2000 U.S. census data (Montana Department of Commerce, 2000a). There are 56 counties in Montana; but, because of the low numbers of respondents in some of the counties, 49 counties were included in the analyses.

Multilevel regression analyses

Multilevel logistic and linear regression analyses were conducted to examine the relationships between individual and county-level factors and drinking and alcohol sources. These analyses were conducted with HLM Version 6.04 to account for clustering of observations within counties (Raudenbush et al., 2004). The intraclass correlation coefficients for past-30-day alcohol use and lifetime drinking

(i.e., the proportion of variance in drinking behaviors that is between counties) were both .02. In addition, SUDAAN (Research Triangle Institute, 2002) was used for bivariate tests that adjusted for clustering within counties. Individual-level models included participants' race (White as the reference group), gender, and age. The county-level model included alcohol-outlet density per square mile, median income, percentage of single-parent households, and percentage Native American population. Population density was initially included in the models but was ultimately dropped because it was highly correlated with the percentage of Native Americans in the county.

Results

Drinking

Descriptive statistics for the sample are provided in Table 1. More Native American youths had consumed alcohol in their lifetime, consumed alcohol in the past 30 days, and engaged in heavy episodic drinking in the past 30 days than White youths. On average, Native American drinkers had their first sip of alcohol at a younger age than White youths. Regular (once a month) drinking also began at an earlier age for Native American drinkers than for White drinkers. When asked about how easy or difficult it was to access alcohol, Native Americans and White youths considered it "sort of easy," with White youths considering it easier than Native American youths.

Sources for alcohol. The most common source of alcohol for Native American and White youths was someone age 21 or older. More than half (52%) of Native Americans and 44% of Whites reported getting alcohol from someone age 21 or older. This source was followed by someone younger than age 21 (17% of Native Americans and 25% of Whites). Commercial sources were not commonly used. Slightly more than 8% of Native American and White youths reported getting alcohol from such sources (e.g., stealing from a shop or buying with or without ID). Buying alcohol without a fake ID was reported by approximately 4% of Native American and 3% of White youths. Stealing alcohol from a shop was reported by approximately 3% of Native American and White youths. About 2% of Native American youths and White youths reported using a fake ID to purchase alcohol. Almost 12% of Native American youths and fewer than 7% of White youths obtained alcohol from strangers. Twice as many White as Native American youths (33% vs. 17%, respectively) reported getting alcohol from home (with or without permission). Twice as many Native Americans as White youths (16% vs. 8%, respectively) reported getting alcohol from another relative. About 10% of Native American and White youths reported getting alcohol from a sibling.

County-level variables. Alcohol retail outlet density ranged from .0013 to .3134, with a mean of .031 ($SD =$

TABLE 1. Sample descriptives^a

Predictors	Native American <i>M (SD)</i> or % (<i>n</i> = 1,416)	White <i>M (SD)</i> or % (<i>n</i> = 17,500)	<i>p</i>
Individual characteristics			
Male	49.8%	50.2%	<.836
Age, years	15.3 (1.77)	15.4 (1.74)	<.095
Drinking behaviors			
Lifetime drinking	73.5%	63.9%	<.001
30-day drinking ^b	63.4%	56.3%	<.001
Heavy episodic drinking (past 2 weeks) ^b	46.9%	35.5%	<.001
Age at first sip, years	12.4 (2.43)	12.8 (2.56)	<.023
Age at first real alcohol, years	13.8 (2.14)	14.5 (2.00)	<.001
Ease of access to alcohol ^c	2.8 (1.14)	2.9 (1.07)	<.001
Sources of alcohol ^b			
From home with permission	6.4%	15.3%	<.004
From home without permission	10.1%	17.4%	<.003
Sibling	10.4%	9.7%	<.069
Other relative	16.1%	8.1%	<.002
Someone < age 21	17.0%	25.0%	<.062
Someone ≥ age 21	52.0%	44.0%	<.004
Stranger	11.7%	6.6%	<.001
Bought with fake ID	1.9%	2.4%	<.923
Bought without fake ID	3.6%	3.3%	<.486
Stole from shop	2.9%	2.8%	<.553

Notes: ID = identification. ^aAdjusted for clustering within counties; ^bdrinkers only; ^c1 = *very hard* to 4 = *very easy*.

.05). Median income (in \$10,000) ranged from 2.8 to 5.5, with a mean of 3.8 (*SD* = .6). Percentage of single-parent households in the county ranged from 7.0 to 35.0, with a mean of 16.4 (*SD* = 5.6). Percentage of Native Americans in the county ranged from 0.4 to 61.2, with a mean of 7.9 (*SD* = 15.5). The seven counties with the highest percentage of Native Americans were also the counties that are primarily Native American reservation land.

Drinking behaviors. Results of these analyses indicated that Native American youths were more likely than White youths to have used alcohol in their lifetime and in the last 30 days (Table 2) after controlling for age and gender. Native American youths were also more likely to have engaged in heavy episodic drinking in the past 2 weeks. Significant

positive relationships were found for gender and age with lifetime use, 30-day use, and heavy episodic drinking, with males reporting more frequent and heavier drinking.

Age at first drink and initiation of regular consumption of alcohol showed the same trend. Native American youths reported first alcohol consumption at younger ages than White youths. Males also reported their first alcohol consumption at younger ages when compared with females. Not surprisingly, current age was positively related with age at first alcohol consumption because these variables are confounded. There were also differences in youths' perception of how easy it was to access alcohol. Overall, Native Americans reported that it was more difficult to obtain alcohol than did White youths, and males perceived it to be more difficult than did

TABLE 2. Results of regression analyses to assess relationships between individual- and county-level predictors and drinking behaviors

Predictors	Lifetime use	30-day use ^a	Heavy episodic drinking (past 2 weeks) ^a	Age at first sip	Age at first real alcohol	Ease of access to alcohol
Individual characteristics						
Native American ^b	2.67 (0.55)***	1.97 (0.38)***	0.80 (0.12)***	-0.40 (0.09)***	-0.48 (0.07)***	-0.17 (0.04)***
Male	0.95 (0.20)***	1.33 (0.18)***	0.43 (0.05)***	-0.55 (0.05)***	-0.33 (0.05)***	-0.08 (0.02)***
Age	3.33 (0.09)***	0.74 (0.06)***	0.24 (0.01)***	0.63 (0.02)***	0.64 (0.02)***	0.17 (0.008)***
County-level characteristics						
Alcohol retail outlets	-0.10 (0.28)	-1.67 (1.98)	-0.73 (0.47)	0.59 (0.84)	0.03 (0.55)	-0.29 (0.17)
Median income	-1.47 (0.43)**	-0.32 (0.27)	-0.10 (0.06)	-0.005 (0.09)	0.03 (0.06)	-0.05 (0.02)*
% Single-parent households	0.18 (0.08)*	0.19 (0.05)***	0.05 (0.01)***	0.009 (0.02)	-0.005 (0.01)	0.009 (0.005)
% Native American	-0.07 (0.03)**	-0.07 (0.02)***	-0.01 (0.004)***	0.009 (0.007)	0.006 (0.004)	-0.003 (0.002)

Notes: Table entries are unstandardized regression coefficients. Standard errors are shown in parentheses. ^aLifetime drinkers only; ^bWhite is the reference group.

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

TABLE 3. Results of logistic regression analyses to assess relationships between individual- and county-level predictors and source of alcohol (lifetime drinkers only)

Sources of alcohol	From home with permission	From home without permission	Sibling	Other relative	Someone < age 21	Someone ≥ age 21	Stranger	Bought without fake ID	Bought with fake ID	Stole from shop
Native American ^a	0.50 (0.38, 0.66)***	0.60 (0.46, 0.79)***	1.35 (1.06, 1.72)*	2.28 (1.83, 2.83)***	0.70 (0.58, 0.84)***	1.49 (1.27, 1.74)***	2.09 (1.64, 2.67)***	1.44 (0.92, 2.28)	1.08 (0.62, 1.86)	1.68 (1.06, 2.65)*
Male	0.79 (0.73, 0.85)***	0.85 (0.77, 0.94)**	0.91 (0.79, 1.04)	0.96 (0.86, 1.08)	0.73 (0.67, 0.79)***	0.75 (0.68, 0.83)***	1.39 (1.22, 1.59)***	2.49 (2.06, 3.02)***	3.81 (2.86, 5.08)***	2.78 (2.11, 3.566)***
Age	0.98 (0.94, 1.01)	0.95 (0.92, 0.98)***	1.12 (1.08, 1.15)***	1.00 (0.96, 1.04)	1.17 (1.12, 1.22)***	1.50 (1.45, 1.55)***	1.29 (1.23, 1.36)***	1.49 (1.36, 1.64)***	1.43 (1.33, 1.55)***	1.04 (0.98, 1.10)
Alcohol outlets	0.74 (0.13, 4.32)	1.39 (0.66, 2.95)	1.88 (0.75, 4.73)	1.52 (0.22, 10.50)	0.46 (0.13, 1.67)	1.19 (0.26, 5.45)	1.89 (0.47, 7.68)	8.29 (0.55, 125.59)	0.75 (0.10, 5.88)	4.31 (0.49, 37.78)
Median income	1.18 (0.99, 1.39)	1.14 (1.06, 1.24)**	1.04 (0.94, 1.15)	1.05 (0.87, 1.27)	1.05 (0.94, 1.17)	0.89 (0.77, 1.03)	1.05 (0.84, 1.30)	1.12 (0.89, 1.41)	1.64 (1.16, 2.34)*	1.82 (1.44, 2.31)***
% Single-parent households	1.01 (0.97, 1.06)	1.01 (0.99, 1.03)	1.02 (0.99, 1.04)	1.01 (0.95, 1.07)	1.03 (1.00, 1.07)*	1.01 (0.99, 1.04)	1.06 (1.02, 1.11)**	1.03 (0.96, 1.10)	1.08 (0.99, 1.17)	1.01 (0.95, 1.08)
% Native American	0.98 (0.97, 0.1.00)	0.99 (0.98, 0.99)*	0.99 (0.98, 0.99)**	1 (0.99, 1.01)	0.98 (0.98, 0.99)**	1 (0.99, 1.01)	0.99 (0.97, 1.00)	0.99 (0.97, 1.01)	0.98 (0.96, 1.00)	0.98 (0.96, 1.01)

Notes: Table entries are adjusted odds ratios (95% confidence interval). ID = identification. ^aWhite is the reference group.

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

females. Age was positively related to ease of access, with older youths reporting easier access to alcohol.

At the county level, the density of alcohol outlets was not related to drinking behavior. We found that median income was negatively related to lifetime use and perceptions of ease of access to alcohol. The percentage of single-parent households in the county was positively related to lifetime use, 30-day use, and heavy episodic drinking. The percentage of Native Americans in the county was negatively related to lifetime use, 30-day use, and heavy episodic drinking. To further explore these findings, we looked at the interactions between the percentage of Native American population and race. None of these interactions was significant, indicating that similar effects were found for White and Native American youths. That is, in both cases, those living in counties with higher populations of Native Americans drank less.

Sources of alcohol. The results in Table 3 indicate that Native American drinkers were less likely than White drinkers to obtain alcohol from home with or without permission and were less likely to obtain it from someone younger than age 21. After controlling for background and county-level factors, Native American youths, however, were more likely to obtain alcohol from siblings, from other relatives, from someone age 21 or older, from a stranger, or through theft from a store. Native American and White youths did not differ in their access to alcohol through purchases with or without a fake ID.

Gender and age were also related to the sources through which youths accessed alcohol. Male drinkers were less likely than female drinkers to obtain alcohol from home with or without permission, from someone younger than age 21, or from someone age 21 or older. Males were more likely to access alcohol through strangers, purchase it with or without a fake ID, or steal it from a shop. Males and females

did not differ in accessing alcohol through siblings or other relatives. Age was positively related to accessing alcohol through siblings, someone younger than 21, someone age 21 or older, a stranger, and buying it with or without a fake ID. Age was negatively related to accessing alcohol from home without permission. Age did not play a role in accessing alcohol from home with permission, through other relatives, or through theft.

At the county level, the density of alcohol retail outlets was not related to where and how youths accessed alcohol. Youths in counties with a higher median income were more likely to report getting alcohol from home without permission, buying alcohol with a fake ID, and stealing alcohol from a shop. Youths in counties with a higher percentage of single-parent households were more likely to report getting alcohol from a stranger and someone younger than age 21. Youths in counties with a higher percentage of Native Americans were less likely to report getting alcohol from home without permission, from a sibling, and from someone younger than age 21. These effects, however, were small.

Discussion

This study is consistent with previous research in finding that Native American youths were more likely than White youths to have consumed alcohol in their lifetime and in the past 30 days, and to report heavy episodic drinking (e.g., Bachman et al., 1991; Friese and Grube, 2008; Spear et al., 2005). Retail alcohol-outlet density was not significantly related to drinking in any of the analyses. This lack of findings contrasts with previous research (Chen et al., 2010; Huckle et al., 2008; Treno et al., 2003; Truong and Sturm, 2009). The lack of effects in the present study may, in part, be the result of the county being too large a geographical

unit to adequately capture the relation between alcohol-outlet density and drinking. To the extent that alcohol outlets are concentrated in smaller geographical areas (e.g., relatively urbanized areas, along roadways), any relation between density and youth drinking may have been attenuated in our study. Unfortunately, the available data do not identify outlet locations more specifically than the county level.

Median income was negatively related to lifetime drinking and how easy it is to obtain alcohol. It may be that counties with a lower median income have other factors that lead to increased alcohol use among youths. For example, family income is often used as an indicator of community disorganization, with communities with higher rates of poverty having an increased risk for youth drinking. Median income was, however, positively related to stealing alcohol from a store, indicating that youths from higher income counties were more likely to steal alcohol than those from lower income counties. This may be a result of it being more difficult to access alcohol from other sources in higher income communities. Median income was also positively related to getting alcohol from home without permission and buying alcohol with a fake ID.

The percentage of single-parent households was positively related to lifetime drinking, 30-day use, and heavy episodic drinking, as well as getting alcohol through strangers or someone younger than age 21. One potential explanation of this pattern may be that youths in one-parent households are monitored less closely than youths in two-parent households, which has been shown to be related to adolescent risk behaviors (DiClemente et al., 2001).

Living in a county with a greater percentage of Native Americans was negatively related to youth access to alcohol through home without permission, siblings, and someone younger than age 21. The percentage of Native Americans in the county was also negatively related to lifetime use, 30-day use, and heavy episodic drinking. These relations held for both Native American and White youths. This pattern suggests that youths in counties with higher proportions of Native Americans drink less. It may be that communities with a higher proportion of Native Americans provide an environment for youths that has a protective effect. For example, studies have shown that Native American youths who feel cultural pride and a stronger cultural orientation may exhibit fewer alcohol problems (Herman-Stahl et al., 2003; Yu and Stiffman, 2007). In contrast, however, other studies have found that identification with Native American culture, living on reservations, and participation in Native American traditions may increase substance and alcohol use in some cases (Edwards and Edwards, 1988; Petoskey et al., 1998; Yu and Stiffman, 2007). These relations may be dependent on the particular tribe or cultural traditions involved. However, we found that living in a county with a higher proportion of Native Americans was also protective for White youths, as well as Native American youths. This suggests that there

may be other social and environmental factors (e.g., lower access, less permissive norms, stricter enforcement of underage drinking laws, or ongoing prevention efforts focused on youths) that are protective in the Native American communities in our sample. This study cannot determine exactly what aspect of Montana's Native American communities may be related to reduced alcohol use and access to alcohol among both Native American and White youths.

Our study suggests that the role of the family may be a particularly important factor that needs further exploration. It has been hypothesized (Beauvais et al., 2002) that Native American parents may support youth drinking and use alcohol as a way to maintain family bonds. Our data do not support this hypothesis among the Native Americans included in this study. Rather, our data show that the Native American youths in our sample do not have the same access to alcohol at home as do White youths. A similar pattern was found in our previous study of Native American and White youths in Wisconsin (Fries and Grube, 2008). It may be that Native American parents are more proactive about preventing youth access to alcohol in the home. For example, a study examining antismoking socialization found that Native American parents were less likely than White parents to believe that schools are better than parents in teaching children about the dangers of smoking cigarettes (Kegler and Malcoe, 2005). This belief may be related to preventative steps taken by parents. In addition, tribal norms regarding alcohol may influence parental behavior.

Findings from this study indicate that other adults (other relatives, strangers, someone age 21 or older) should be targeted for prevention efforts for Native American youths, because adults other than parents are the primary providers of alcohol to them. Educating adults about the risks and legal liability of providing adolescents with alcohol, as well as law enforcement strategies (e.g., "shoulder tap" operations [where an underage decoy asks an adult to purchase alcohol for him or her] and teen party ordinances), may be a useful starting point. The focus for White youths should be on parents and other underage drinkers who provide alcohol. In particular, family interventions should focus on providing parents with guidelines about how to prevent youths from accessing alcohol at home. In addition, social host ordinances may prevent some parents or other adults from providing alcohol to youths. In summary, the data presented here indicate that strategies that aim to limit access to alcohol only through commercial sources may not be enough to prevent or reduce youth alcohol use. Furthermore, racial and ethnic differences in the means by which youths access to alcohol are important considerations when selecting interventions. Such interventions need to be tailored to specific populations.

One of the strengths of this study is that the data set is unique in including a large number of Native American youths. However, there are several limitations. One of the

limitations of data used for this and the majority of other studies that include Native Americans is that typically only a small number of tribes are represented. This is an important consideration, because alcohol use may vary in social acceptability among tribes, and access to alcohol may be influenced by tribal norms and availability of alcohol for specific reservations and in specific communities. Further research should address how underage drinking norms and access to alcohol may differ among different Native American communities. In addition, the study findings based on Montana data may not generalize to youths in other parts of the United States. The study's cross-sectional design also precludes causal interpretations of the observed relations. We do not know if drinking is influenced by the source of alcohol or if the source of alcohol influences drinking behavior. For example, it is unclear whether youths obtaining alcohol from a certain source drink more alcohol or whether drinking behaviors lead to accessing alcohol from specific sources. It may be that youths who drink frequently are more reliant on certain sources or are more likely to access alcohol through multiple sources, compared with youths who drink infrequently. Conversely, it may be that greater amounts of alcohol are obtained from certain sources, which then leads to heavier drinking. Longitudinal research is needed to better ascertain the directionality of these relationships.

In addition, the participation rate in the survey was low. Of all eligible students in Grades 8, 10, and 12 across all eligible schools in Montana, 66% participated. Another shortcoming of a school-based survey is that youths who drop out are not represented. In Montana, the dropout rate is higher among Native American youths than among White youths (7.5% vs. 3.2% of 9th-12th graders; National Center for Education Statistics, 2007). However, overall, the dropout rate is low and likely does not have a significant effect on the findings.

An additional limitation is that our measures for many of the environmental factors were at the county level. The county may be too large a unit to thoroughly investigate such influences on youth drinking. For example, in contrast to some previous research (Chen et al., 2010; Huckle et al., 2008; Treno et al., 2003; Truong and Sturm, 2009), density of alcohol retail outlets was not related to drinking behavior or access to alcohol in this study. Using data for smaller geographic units, such as census blocks, may be a more optimal unit of measurement. In addition, some of the county-level effects may represent individual-level effects. Single-family household and median income, for example, were included at the county level, but no equivalent individual-level variables were available.

Despite these limitations, this study highlights the importance of considering different ethnic and racial groups when considering youth drinking behaviors and access to alcohol. This study further suggests that environmental interventions to address alcohol access need to be tailored for different

populations or communities. The evidence presented here indicates that strategies that aim to limit access to alcohol through commercial sources may not be enough to reduce youth alcohol use and that racial differences in access to alcohol are an important consideration when selecting interventions or different populations. Findings indicate that prevention efforts need to take group and possibly community differences into account to be effective.

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