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Sixth Grade Students Who Use Alcohol:

Do We Need Primary Prevention Programs for “Tweens”?

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Abstract

Young adolescent alcohol users drink at higher rates than their peers throughout adolescence and appear to be less amenable to intervention. This study compares those who reported alcohol use in the past year to those who reported no use in a multiethnic, urban sample of sixth graders in 61 schools in Chicago in 2002 ($N = 4,150$). Demographic, behavioral, intrapersonal, and socioenvironmental factors were identified based on behavioral theories and potential mediators of the Project Northland Chicago intervention. Single and multiple regression models were created for users and nonusers to determine associations between these factors and alcohol use behavior and intentions. The multiple regression models explained 35% and 56% of the variance in alcohol use behavior and intentions between students for nonusers and users, respectively. Results suggest that primary prevention programs for alcohol use should occur prior to sixth grade, particularly for the substantial group at high risk for early use.

Keywords

alcohol use; adolescents; nonusers

Although alcohol use is normative among adults, and although alcohol is the most commonly used psychoactive drug among adolescents (Guo, Collins, Hill, & Hawkins, 2000), early adolescent alcohol use is precocious and associated with multiple social, behavioral, and developmental problems. These problems include the use of tobacco and illicit drugs, particularly marijuana, and other behaviors such as fighting, stealing, skipping school, feeling depressed, and deliberately trying to hurt or kill oneself (Grant & Dawson, 1997). Use of alcohol during adolescence can affect brain development, affecting emotional regulation and motivation, during a crucial time when abstract thinking and reasoning become possible (Zucker, 2006).

Pre- or early adolescent alcohol use is related to significant problems later in life. Gruber, DiClemente, Anderson, and Lodico (1996) found that onset of alcohol use by age 12 was associated with subsequent use of alcohol and problem behaviors in later adolescence, including alcohol-related violence, alcohol-related injuries, drinking and driving, and

absenteeism from school or work, and with being at increased risk for using other drugs. Hawkins et al. (1997) found that early initiation of alcohol use mediated nearly all of the identified risk factors for subsequent alcohol use, including parental drinking, proactive parenting, school bonding, peer alcohol initiation, and ethnicity. Youth who drink before age 15 are estimated to be 4 times more likely to develop alcohol dependence than are those who begin drinking after age 18 (Grant & Dawson, 1997). These data, from the National Longitudinal Alcohol Epidemiologic Survey, indicate that the odds of alcohol dependence decreased by 14% with each increasing year of age at onset of use, and the odds of abuse decreased by 8% (Grant & Dawson, 1997). Notably, of those who began to drink before age 12, 16% reported being dependent on alcohol in the past year as adults (Substance Abuse and Mental Health Services Administration, 2004).

Early alcohol use is found among all races/ethnicities, all socioeconomic strata, both genders, and urban to rural populations. The prevalence of adolescent alcohol use is substantial, even though the rate of use has declined somewhat since 1999 (Johnston, O'Malley, Bachman, & Schulenberg, 2005). Overall, according to 2005 data from the Monitoring the Future national survey, 33.9% of eighth graders used alcohol and 14.1% reported having been drunk in the past year. In addition, 17.1% had used alcohol and 6.0% had been drunk in the past month (Johnston, O'Malley, Bachman, & Schulenberg, 2006).

Early alcohol use has been conceptualized as an interaction of social, environmental, intrapersonal, and behavioral factors. Prior research on social factors has shown an association between early conduct problems at ages 7 to 9 and alcoholism 25 years later (Fergusson, Horwood, & Ridder, 2005). Early use of other substances, feelings of depression, and deviant or violent behaviors also increase the likelihood of early alcohol initiation among youth (Donovan, 2004). Interestingly, youth who own alcohol-promotion items have been found to be more likely to initiate alcohol use than those youth who do not own alcohol-promotion items (McClure, Dal Cin, Gibson, & Sargent, 2006). Time spent with family members (Sweeting, West, & Richards, 1998), participation in extracurricular activities and sports (Harrison & Narayan, 2003), and participation in religious activities (Sinha, Cnaan, & Gelles, 2007) have all been found to reduce the likelihood of alcohol use among adolescents, whereas less is known about these and preadolescent alcohol use.

The most consistent socioenvironmental risk factors for early alcohol use are peer and parental factors (Donovan et al., 2004). Open and frequent parent-child communication has been found to be a protective factor of alcohol use (Kelly, Comello, & Hunn, 2002). Regular and consistent parental monitoring predicts less subsequent onset of alcohol and other drug use (Donovan, 2004), whereas less parental monitoring predicts increases in early alcohol use among youth (Pettit, Laird, Dodge, Bates, & Criss, 2001). Alcohol use by peers, perceptions of peer use, and perceptions of peer influence to use all significantly increase the likelihood of early alcohol use initiation (Donovan, 2004). Hawkins and colleagues (1997) found that those children who had alcohol-using peers at ages 10 to 11 were more likely to initiate early alcohol use and to misuse alcohol when they were older than were children who did not have alcohol-using peers.

In addition to peer and parent factors, access to alcohol, offers of alcohol, and normative expectations help to create an environment that is either conducive to or prohibitive of alcohol use. Among adolescents, intrapersonal factors such as normative beliefs and normative estimates (Komro et al., 2001) are important predictors of intentions to use alcohol and alcohol use. Self-efficacy has also been associated with drinking behavior, and positive expectations or expectancies about drinking may also predispose a child to early use (Donovan, 2004; Hipwell et al., 2005). Adolescents are more likely to use alcohol at earlier ages when they have fewer negative expectations concerning alcohol use (Hipwell et al., 2005).

Although much is known about the risk factors for early adolescent alcohol use, more research is needed to determine which factors are the most salient and modifiable before adolescents begin using alcohol and which factors are amenable to change after use has been initiated. In addition, few studies have used multiethnic, urban, large samples to examine differences in these risk and protective factors at the beginning of early adolescence (sixth grade). As such, comprehensive and robust models, which are multifactorial and include potential targets for prevention interventions, are needed to determine the most potent and predictive factors associated with early onset to guide the development of early preventive interventions. This study seeks to determine how early users of alcohol differ from those adolescents who have not yet initiated alcohol use. In addition, this study provides information about the strongest risk factors for alcohol use to target for each of these two groups.

Project Northland Chicago (PNC) is an alcohol use prevention program involving more than 4,000 sixth through eighth grade students in inner-city Chicago. PNC is an adaptation of Project Northland, which was developed and evaluated in rural northern Minnesota (Komro, Perry, Veblen-Mortenson, et al., 2004). Significant outcomes in terms of reduced alcohol use onset and prevalence were noted among young adolescents in the original Project Northland trial (Perry et al., 1996). However, among the 37% of students who reported having ever had a drink of alcohol at baseline in this study, when they were sixth grade students in 1991, the project was less effective (Perry et al., 1996). In addition, those baseline users of alcohol had a higher prevalence of alcohol use than did baseline nonusers throughout the project's duration (Perry et al., 1996). Thus, it seemed as if Project Northland may have been *too late* for those students who were already using alcohol at the beginning of sixth grade.

These findings suggest that primary prevention of alcohol use might need to occur prior to sixth grade, while students are in their "tween-age" years, between childhood and early adolescence, about third through fifth grades. It seems particularly important to examine how sixth grade alcohol users (early users) are different from sixth grade nonusers but to do so with a more contemporary, more urban, and larger sample of students. The current study examines the risk and protective factors associated with alcohol use behavior and intentions among baseline users and nonusers of alcohol from PNC and differences in these risk and protective factors that distinguish the two groups. This examination takes advantage of the more recent, larger, and more urban sample available with PNC to create more robust models that explain alcohol use behavior and intentions in this age group to provide guidance for early alcohol use prevention efforts. This study addresses the following primary question:

Which demographic, socioenvironmental, intrapersonal, and behavioral factors most distinguish users from nonusers?

Based on previous research, social cognitive theory, and the theory of triadic influence, it is hypothesized that sixth grade (early) alcohol users will be at significantly greater socioenvironmental, intrapersonal, and behavioral risk than nonusers, as evidenced by differences in the "risk profiles" of these two groups. In addition, this study explores which demographic, socioenvironmental, intrapersonal, and behavioral factors are associated with alcohol use behavior and intentions for sixth grade alcohol users and nonusers. It also identifies which factors are most potent or most strongly associated with alcohol use behavior and intentions in these two groups of young adolescents (i.e., How much of the variance in early alcohol use behavior and intentions is accounted for by these factors?). Although it is expected that a different set of risk factors will be correlated with alcohol behavior and intentions in each of these two groups (early users and nonusers) and that the importance of these risk factors will also vary by group, formal hypotheses have not been generated a priori. It is imperative that we understand which risk factors are the most influential in developing alcohol use behaviors and intentions, especially among early users of alcohol, to intervene to prevent early

alcohol use among tweens. The knowledge gained in this study will provide information about useful intervention points that can be incorporated into universal intervention programs, particularly early intervention programs in elementary school, that will help to more effectively reduce the prevalence of preadolescent alcohol use (Donovan et al., 2004).

METHOD

Study Design

PNC is a nested cohort group randomized trial (Komro et al., 2006). In 2002, 61 schools and neighborhoods in Chicago were recruited to participate in the trial. Schools were included if they had fifth through eighth grade students, had relatively low mobility rates (less than 25% per year), and were larger schools (at least 30 students per grade). Schools and neighborhoods were grouped into 22 units, matched, and randomized to intervention or delayed-program conditions (Komro, Perry, Veblen-Mortenson, et al., 2004). The intervention included classroom curricula, peer leadership, parental education and involvement, and community organizing over three consecutive years (2002 to 2005). Passive parental consent and active student assent were required and obtained by PNC staff prior to survey administration with students. The data for the current study are cross-sectional and from the baseline survey conducted prior to the intervention program in fall 2002. Ethical clearance for the trial was obtained from the Institutional Review Board at the University of Minnesota.

Participants

All students enrolled in the sixth grade in the 61 schools in 2002 were eligible for this study and invited to participate ($n = 4,658$). The response rate for the survey was 91.4% ($n = 4,259$). When inconsistent responders were excluded (those who had four or more inconsistent responses, or 2.2% of the sample), the sample size was 4,164. The analysis sample ($n = 4,150$) included all students with complete data on alcohol use in the past year. Among these students, 42% were African American, 29% were Hispanic, 13% were White, and 16% were Asian, Native American, or Mixed or Other. The sample was evenly divided across males and females, and the average age was 11.8 years. Students were considered alcohol “users” if they reported having had at least one drink of alcohol in the past year. At baseline, 17.2% or 713 students were classified as users, and 82.8% or 3,437 students were classified as nonusers.

Measures

A self-administered paper and pencil survey was implemented in all sixth grade classrooms in the 61 schools by trained PNC staff using standardized protocols. The confidentiality of student responses was assured, and a unique ID code that was not recognizable to the students or school staff was used for each student. The survey included items that assessed alcohol use behaviors and intentions, behavioral and psychosocial factors associated with the onset of alcohol use (e.g., intrapersonal and socioenvironmental factors), and demographic information (age, gender, race/ethnicity, family composition, language spoken at home, and enrollment in free or reduced-price lunch program as a measure of low income status). The Alcohol Use Behavior and Intentions Scale was created for the original Project Northland in Minnesota (Williams, Toomey, McGovern, Wagenaar, & Perry, 1995), and a slightly modified version was used for the current Chicago study. Other measures have also been used in our previous research with adequate reliability and validity (Komro, Perry, Munson, Stigler, & Farbachsh, 2004; Williams et al., 1995).

Alcohol Use—The primary dependent measure in these analyses is the Alcohol Use Behavior and Intentions Scale, which includes nine items: five alcohol use items (“During the last 12 months, on how many occasions, or times, have you had alcoholic beverages to drink?”; “During the last 30 days, on how many occasions, or times, have you had alcoholic beverages

to drink?”; “During the last 7 days, on how many occasions, or times, have you had alcoholic beverages to drink?”; “Think back over the last two weeks, how many time have you had five or more alcoholic drinks in a row?”; “Have you ever gotten really drunk from drinking alcoholic beverages, so you fell down or got sick?”) and four intentions to use items (“Would you drink alcohol if best friend offered it to you?”; “Do you think you will be drinking alcohol . . . In next month? When a senior in high school? When you are an adult?”). The scale ranges from 9 to 45, and the mean at baseline was 11.1 ($SD = 3.5$), with a Cronbach’s alpha of .82.

The four intentions items that make up the Alcohol Use Intentions Scale are particularly important for this study of early-onset drinking. Alcohol use behaviors and intentions are combined into one scale because intentions are powerful predictors of future behaviors (Webb, Baer, Getz, & McKelvey, 1996). Among beginning sixth grade students in PNC, intentions to drink were significantly correlated with drinking at the end of eighth grade ($r = .29, p < .001$), and this correlation was actually higher than the correlation between drinking at the beginning of sixth grade and drinking at the end of eighth grade ($r = .22, p < .001$). In addition, there is considerable variability in the Alcohol Use Behavior and Intentions Scale that measures progression toward early-onset drinking. This progression suggests a continuum of alcohol use that progresses from having no intentions to use alcohol to problematic alcohol use. Project Northland, in its original trial, was able to demonstrate reductions in the Alcohol Use Behavior and Intentions Scale at the end of eighth grade (and the end of twelfth grade; Perry et al., 2002). Finally, we wanted to employ one scale that would be appropriate for alcohol users and nonusers to make parallel comparisons between groups in terms of the strength of the predictors.

Demographic Factors—All demographic information was obtained from single-item questions. Gender was indicated as *boy* or *girl*, with boy coded as the reference category. Race/ethnicity was selected from a list including *Asian American*, *Black*, *Latino*, *Native American*, *White*, or *Mixed or Other*. In the first set of analyses (see Table 1 and the single regression models in Tables 2 and 3), each category of race was considered separately. That is, one variable was used to represent one category of race (e.g., White, in which 1 = White and 0 = non-White). This variable was included as a single independent variable in the regression models. In the second set of analyses (see the multiple regression models in Tables 2 and 3), race was, instead, dummy coded. That is, a set of five variables was used to represent all categories of race, with Blacks as the referent group in this analysis, because the prevalence of alcohol use was lowest in this group. In this analysis, this set of five variables was included as multiple independent variables in the regression models. Language spoken at home was coded as *English* or *other language* (collapsed from Spanish and other). Free or reduced-price lunch was coded as *receiving free or reduced-price lunch* or *not* (collapsed from no and don’t know). The amount of time the student lived in the country was assessed with five options ranging from *less than 1 year* to *all of the student’s life*. The response categories were recoded and given the value of the midpoint of the range for each response category (*less than 1 year* coded as 0, *1 to 3 years* coded as 2, *4 to 6 years* coded as 5, *7 to 9 years* coded as 8, and *all of your life* coded as 11). The response options for family composition included eight categories (*mother and father together*; *mother and father equally, at separate homes*; *mother mostly*; *father mostly*; *grandparent*; *other relative*; *foster parents*; and *other*). The response options were collapsed into two categories: *two-parent family* and *other*. Age was calculated using the student’s birthday. Ranges, means, and percentages for the demographic items are shown in Table 4.

Behavioral Risk Factors—These factors involve behaviors that are likely to covary with alcohol use. Smoking was assessed in two ways: *past-month smoking* and *ever smoked*. Both smoking items were assessed using a dichotomous question asking if the student had smoked a cigarette in the past month or ever. Marijuana use was also assessed in two ways: *past year*

use and past-month use. The response options for these questions range from 0 to 40 or more occasions. These responses were recoded by assigning the midpoint of the response category as the student's response (e.g., 3 to 5 occasions coded as 4 occasions). Feeling depressed was measured with one item that asked the student how many times he or she felt sad or depressed in the past month, with responses options ranging from *never* to *4 times*. This item was recoded into *never* and *1 or more times*. Violent and delinquent behaviors were measured with two separate scales. Violent behavior was measured with four items regarding past-month behavior (beating someone up, pushing someone, kicking someone, and fighting); response options were *never*, *1 to 3 times*, and *4 or more times*. This scale has been previously used in a similar population and was found to be reliable (Cronbach's alpha of .76; Komro, Perry, Munson, et al., 2004). Delinquent behavior was measured with four items assessing past-month behavior (stealing from a store, skipping school, not following school rules, detention); response options were *never*, *1 to 3 times*, and *4 or more times*. Also included were two items that measured susceptibility to use alcohol—whether a young person owns or would wear an item with the name of an alcoholic beverage on it; similar items have been shown to be very potent in predicting early tobacco use (Pierce, Choi, Gilpin, Farkas, & Berry, 1998). The “own alcohol” question asked if the student owned or collected anything with the name of an alcoholic beverage on it. The “wear alcohol” question asked if the student would ever wear or use an item that has the name of an alcoholic beverage on it. The response options for these questions were yes or no.

Another behavioral items was an assessment of the way young adolescents use their time by asking about the number of hours spent in various activities, also shown in Table 4. Two separate one-item questions asked the student how many hours a day he or she spent doing homework and without an adult. The response options for these questions were *none*, *less than 1 hour*, *1 to 2 hours*, *3 to 4 hours*, and *5 or more hours*. The response options were recoded by assigning the midpoint of the category as the response (e.g., 1 to 2 hours coded as 1.5 hours). Three other questions asked the student how many hours in a week he or she spent in after-school clubs or groups with adult supervision, doing physical activities outside of gym class, and attending religious services, groups, or activities. The response options for these questions were *none*, *1 to 2 hours*, *3 to 5 hours*, *6 to 10 hours*, and *11 hours*. The response options were also recoded by assigning the midpoint of the category as the response (e.g., 3 to 5 hours coded as 4 hours). In this inner-city setting, we hypothesized that more structured and supervised time in these activities would be associated with less alcohol use. The items and scales used to measure these behaviors are shown in Table 4.

Psychosocial Risk Factors—The selection of independent measures was guided by social cognitive theory and the theory of triadic influence (Baranowski, Perry, & Parcel, 1997; Flay & Petraitis, 1994) and by those factors that were seen as potential mediators for the PNC intervention (Komro et al., 2006). The intrapersonal psychosocial risk factors included self-efficacy (confidence to perform the behaviors or refuse offers), outcome expectations (expectations of what may happen if the student was to use alcohol), and outcome expectancies (reasons not to use alcohol). More detail on the content and construction of these factors can be found elsewhere (Komro, Perry, Munson, et al., 2004; Williams et al., 1995).

Socioenvironmental Risk Factors—Several socioenvironmental factors were used in this study. Parental monitoring was measured with one item that asked the student how often his or her parent asked where the student is going or who the student would be with. Parent communication included six items that asked the student how often the parent asked about what the student is doing in school, the parent praised the student when he or she did a good job, the student ate dinner with a parent, the student talked to the parent for 10 minutes or more, the parent restricted music or music videos, and the parent talked to the student about how ads and commercials are used to get people to buy things. Family alcohol discussions included

three items that asked how often the parent talked to the student about problems drinking alcohol can cause young people, family rules regarding young people drinking alcohol, and what would happen if the student were caught drinking alcohol. The response options for the parental monitoring, parent communication, and family alcohol discussion scales were *never*, *hardly ever*, *sometimes*, *a lot*, and *all the time*. Peer alcohol use was measured with how many of the student's friends drank alcohol. The response options for this item were *none*, *a few*, *some*, *many*, and *almost all*. More information about the alcohol offers, alcohol access, normative estimates, and normative expectations scales can be found in Komro, Perry, Munson, et al. (2004). The intrapersonal and socioenvironmental factors, including the number of items, Cronbach's alpha, range, mean, standard deviation, and representative items, are shown in Table 4.

A higher score on all of the behavioral, intrapersonal, and socioenvironmental scales indicates more risk, with the exception of four items assessing time spent in positive activities. Thus, increases in the scale scores are hypothesized to be related to increased alcohol use behavior and intentions. A lower score on hours spent on homework, in religious activities, in sports, and in supervised after-school activities indicates more risk, so these variables are hypothesized to be inversely related to increased alcohol use behavior and intentions.

Data Analysis

A cross-sectional analysis of these data was conducted using mixed-effects regression models. These kinds of regression models are appropriate for studies like these, given their nested design (i.e., students are nested in schools), as they adequately account for the variability in the dependent variable (e.g., alcohol use behavior and intentions), not only between students but also between schools (Raudenbush & Bryk, 2002). To do this, school was specified as a nested random effect in the models. These models were first used to examine differences in risk factors by comparing users and nonusers of alcohol at the start of sixth grade (see Table 1). Users were defined as those students who had at least one drink of alcohol in the past year. Differences in risk were calculated for each factor between the groups (i.e., mean of user minus mean of nonuser). The models were then used to examine the relationship between the risk factors and the Alcohol Use Behavior and Intentions Scale stratified according alcohol use at the start of sixth grade (users vs. nonusers; see Tables 2 and 3). The first set of stratified models (single regression models) examined the relationship between a single risk factor and alcohol use behavior and intentions separately, unadjusted for the other risk factors. Backward stepwise regression was then used to build a final model (multiple regression model) to evaluate which factors were most strongly related to alcohol use behavior and intentions. All risk factors were entered into the regression model to begin, and then factors not significantly related to alcohol use behavior and intentions ($p > .15$) were eliminated one at a time. The percentage of variance in alcohol use and intentions between students and school units explained by the final full model was estimated using the procedures presented in Snijders and Bosker (1994). The correlations between all of the factors examined here did not exceed .90, the cutoff point for multicollinearity suggested by Norman and Streiner (2000). Therefore, each factor was determined to measure a separate construct. All scales were standardized prior to conducting analyses. Standardization allows for the direct comparison of the strength of association of the factors, as each estimate is on a similar scale. All data were analyzed using SAS 9.1 (SAS, 2005).

RESULTS

There were significant differences between baseline users and nonusers in the distribution of *all* of the behavioral, intrapersonal, and socioenvironmental risk factors (with the exception of time spent in after-school activities with adult supervision; see Table 1). All of these differences

were in the expected direction, with baseline users having greater risk than baseline nonusers on all factors (except for the time spent in after-school activities with adult supervision and outside school in sports and being physically active). Among the demographic factors, baseline users, compared to nonusers, were less likely to be Asian and more likely to be of the Mixed or Other racial ethnic group, male, not participating in free or reduced-price meals at school, from non-two-parent families, and older.

Because the scales in Table 1 were standardized prior to analysis, the magnitudes of the differences between users and nonusers on each of the scales can be compared to identify the relatively most potent risk factors. Thus, among the behavioral, socioenvironmental, and intrapersonal risk factors, users were much more likely than nonusers to engage in delinquent and violent behaviors and to have lower self-efficacy, to have positive outcome expectations and expectancies concerning alcohol use, to have greater access to alcohol, to have higher normative estimates of alcohol use, and to have a greater number of friends using alcohol, as indicated by large differences in the standardized scale scores. These risk factors strongly differentiate users from nonusers in this sample.

Nearly all of the behavioral, intrapersonal, and socioenvironmental risk factors were significantly related to alcohol use behavior and intentions for students who were users and nonusers of alcohol at baseline. Table 2 presents the results of the analyses for baseline nonusers, whereas Table 3 presents the results for baseline users.

Among the baseline nonusers (Table 2, single regression models), being White increased the risk and being Asian decreased the risk of alcohol use behavior and intentions. Being male, living in a non-two-parent family, speaking only English at home, and being older were significantly associated with alcohol use behavior and intentions. All of the behavioral, intrapersonal, and socioenvironmental factors (except time spent after school with adult supervision) were significantly associated with increased alcohol use behavior and intentions. The only association that was not in the expected direction was that greater time spent outside of school in sports and being physically active was associated with greater alcohol use behavior and intentions. Among baseline users (Table 3, single regression models), a mostly similar pattern emerged. Being White, however, decreased the risk and being Native American increased the risk of alcohol use behavior and intentions. Being male and being older were also associated with greater alcohol use behavior and intentions. Again, all behavioral, intrapersonal, and socioenvironmental factors were associated with alcohol use behavior and intentions in the expected direction. Among time variables, less time spent doing homework and more time spent without adults were associated with alcohol use intentions and behavior. Thus, the factors selected in our model are important potential mediators of the intervention because nearly all are associated with increased risk of alcohol use behavior and intentions for young adolescents, including both users and nonusers. However, the estimates in the single regression models for the user group were larger than those of nonusers, suggesting stronger associations among users between these factors and alcohol use behavior and intentions.

Among baseline nonusers (Table 2, multiple regression model), 15 factors were most strongly associated with alcohol use intentions and behavior ($p < .15$), with 12 significant factors ($p < .05$). There were no significant demographic factors in this adjusted model. The significant risk factors included having ever smoked, past-month marijuana use, owning alcohol items, wearing alcohol items, engaging in violent behavior, low self-efficacy, outcome expectancies more favorable to alcohol, outcome expectations more favorable to alcohol, alcohol offers, lower parent-child communication, and higher normative estimates. Attending religious activities was a significant protective factor. All factors were in the hypothesized direction. The 15 factors accounted for 35.1% of the variance in alcohol use behavior and intentions between students.

Among baseline users (Table 3, multiple regression model), 15 factors were most strongly associated with alcohol use behavior and intentions ($p < .15$), with 11 significant factors ($p < .05$). The only significant demographic factor in the model was speaking a language other than English at home. Other significant risk factors included past-month smoking, past-year marijuana use, past-month marijuana use, feeling depressed, violent behavior, delinquent behavior, low self-efficacy, outcome expectations more favorable to alcohol, higher normative estimates, and normative expectations more favorable to alcohol. All but one of the factors was in the expected direction. Students who did not report feeling depressed in the past month were more likely to have higher scores on the Alcohol Use Behavior and Intentions Scale. The 15 factors accounted for 56.1% of the variance between students in alcohol use behavior and intentions among baseline users.

DISCUSSION

The results of the comparisons between users and nonusers, shown in Table 1, are reinforced by the findings of the single and multiple regression analyses (in Tables 2 and 3). Clearly, sixth grade users are significantly different than nonusers on nearly every risk factor that is examined. And, again, large differences between the groups are observed for all of the risk-related behaviors, intrapersonal, and socioenvironmental factors, including violent and delinquent behavior, self-efficacy, outcome expectancies and expectations, and normative estimates. Peer alcohol use and access to alcohol are also especially problematic among those who are using alcohol prior to sixth grade. These comparisons underscore the need to intervene earlier and across a wide spectrum of behavioral, intrapersonal, and socioenvironmental factors. Because of the differences found between users and nonusers on almost every risk factor, it was important to separately examine the predictive factors for each group to determine which specific factors were most influential for each group.

The risk factors that were explored in this study were nearly all significantly associated with sixth grade alcohol use behavior and intentions for both users and nonusers when examining each separate relationship. Thus, at first glimpse, all of these risk factors would be important to consider as the focus for creating intervention objectives for the primary prevention of alcohol use with young teens, regardless of their drinking status as a tween. This is especially important because many of these risk factors, particularly the socioenvironmental and intrapersonal factors, have been amenable to intervention (Perry, 1999). The relationships between the risk factors and alcohol use behavior and intentions were stronger for users than for nonusers, with higher estimates in the models. This is likely because of greater variability and range in the outcome measure because users exhibited alcohol use intentions and behavior, whereas nonusers (by definition) had only intentions to use alcohol. Higher scores on intentions to use alcohol are strong predictors of subsequent alcohol use, so those nonusers with high intentions scores are at greater risk to begin to drink (Marcoux & Shope, 1997). Still, the single regression models provide only limited guidance for intervention design because it is important to select the most potent and modifiable risk factors to create powerful yet efficient prevention programs (Perry, 1999).

The multiple regression models narrowed the list of most potent risk factors considerably, yet each model still accounted for a substantial percentage of the individual variance in alcohol use behavior and intentions—35% for nonusers and 56% for users—suggesting that these models were robust, notably so for the users. For the baseline nonusers, among the behavioral variables the powerful associations with other drug use, violence, and less attendance at religious activities have been noted elsewhere (Grant & Dawson, 1997). It is noteworthy that owning or collecting and being willing to wear or use items that have the name of an alcohol beverage on them were significantly associated with alcohol use behavior and intentions. This is similar to what Pierce and colleagues (1998) have noted with tobacco use and suggests that

owning or even being willing to wear one of these items could increase susceptibility to future alcohol use among nonusers. It appears that efforts to restrict alcohol beverage promotional items may be needed, in the same way that the Master Settlement Agreement banned such items for cigarette manufacturers because they were seen as being too youth oriented (Capehart, 2001). Among the intrapersonal factors, nonusers with higher alcohol use behavior and intentions scores were more likely to have low self-efficacy and more positive alcohol outcome expectations and expectancies. Thus, not having the confidence to be able to refuse alcohol, not perceiving negative consequences of alcohol use, and not valuing the potential consequences of alcohol use all appear to be critical. These are important to note because these risk factors are amenable to intervention, as was found in Project Northland, in which self-efficacy and outcome expectancies (i.e., functional meanings) were both modified as a result of the intervention (Perry et al., 1996). Finally, for nonusers, among the socioenvironmental factors, reporting having had offers to drink, having less frequent parent-child communication, and perceiving that more young people drink are all potent risk factors for alcohol use behavior and intentions, suggesting greater peer influence to use and less positive parental influence. Appropriate and amenable targets for intervention might then be to correct normative estimates of drinking if they are too high (Agostinelli & Grube, 2005), to structure opportunities for greater parent-child communication (Kosterman, Hawkins, Haggerty, Spoth, & Redmond, 2001), to increase monitoring of those who might offer alcohol to youth, and to provide skills concerning alcohol refusal (Perry et al., 1996). To a large extent, many of these risk factors have formed the basis for successful prevention programs with young teens (Botvin, Baker, Dusenbury, Botvin, & Diaz, 1995), but these analyses among the nonusers point to those factors that can be used to strengthen the focus of our programs because they highlight the particular factors associated with the greatest risk for subsequent early onset of alcohol use.

Among baseline users, other related behaviors, including tobacco use, marijuana use, violence, and delinquency, predominate in the multiple regression model. This strongly points to the early covariation of these behaviors and the need to intervene with these youth well before sixth grade. There is ample evidence that children who have conduct disorders or engage in deviant behaviors during early and middle childhood are more likely to continue those behaviors into adolescence, including alcohol use (Caspi, Moffitt, Newman, & Silva, 1996; Fergusson et al., 2005; Hawkins et al., 1997). Thus, early intervention, either through selected or universal programs, is needed to alter the developmental trajectories of these related behaviors during childhood, particularly before these trajectories become less mutable to change in adolescence. Among baseline users, the most potent intrapersonal and socioenvironmental factors included low self-efficacy and more positive expectations of the consequences of drinking, perceptions that more peers drink alcohol, and perceptions that those who drink experience more positive outcomes. These are consistent with others' research that suggests that children as young as fourth grade who have positive expectancies around alcohol use are more likely to be early users (Hipwell et al., 2005) and that associating with deviant peers and having poor self-regulatory skills during the tween-age years increase the risk of early alcohol use (National Institute on Alcohol Abuse and Alcoholism, Public Health Service, & National Institutes of Health, 2005). Thus, it seems critical to intervene earlier than sixth grade for the primary prevention of alcohol use, particularly for higher risk students. However, in PNC, 17% of the students were already users at the beginning of sixth grade, about 1 in 6 youth. In PN, 37% of the sample, about 3 in 8 youth, had "ever" used alcohol and were less responsive to the intervention (Perry et al., 1996). Thus, the "users" are a substantial proportion of the sixth grade population. It may be important, then, to design a primary prevention program for tweens, prior to sixth grade, that focuses on specific alcohol-related risk factors, such as alcohol use expectancies, expectations, normative estimates, and normative expectations, found to be important in these analyses but that also focuses on the important developmental tasks of that age group—academic achievement, appropriate conduct, and prosocial peer relationships. This approach, intervening at earlier ages, would allow for universal messages

about alcohol use and yet also provide support for high-risk students who may be developmentally lagging.

There were some unusual findings that should be noted. Among users, feeling depressed was inversely related to alcohol use. This has not been noted before, and others have found a positive relationship between depression and alcohol use (Donovan et al., 2004) or no relationship (Greenblatt, 2000). Thus, this finding is likely because of the question itself, which was a single item asking the students if they felt depressed or sad in the past month and not specifically addressing depressive symptoms. A second unexpected finding was that alcohol users were more likely than nonusers to spend time outside of school being physically active. This included time spent in team sports, with the drill team, biking, walking, or skateboarding. Thus, it may be that the time is not spent under adult supervision but is spent with peers (e.g., skateboarding) who could encourage alcohol use or other related activities in which users may frequently engage. Because peer alcohol use is also much higher among users, it may be that users associate with other users and the potential for access to alcohol increases. Finally, the lack of significant demographic factors in the multiple regression models suggests that with this urban, inner-city population, these factors are less important than the behavioral, intrapersonal, and socioenvironmental factors and that alcohol use is problematic across genders, races/ethnicities, and socioeconomic levels.

This study of users and nonusers of alcohol was strengthened by its large sample size and multiethnic population and by the recentness of the data. The study is limited by being cross-sectional, so that causal inferences cannot be made in the associations presented. Clearly, there is need to follow-up on these analyses as the students mature. Another limitation of this study is the dependent variable: alcohol behaviors and intentions. For sixth grade users of alcohol, the dependent measure included both alcohol behaviors and intentions, whereas for nonusers the dependent measure included only alcohol intentions because, by definition, they did not participate in any current or past alcohol use behaviors. Although there is a difference in the range of the dependent variable for each group, it is one way to explore associations among the behavioral, intrapersonal, and socioenvironmental factors and overall alcohol behaviors and intentions within each of these groups. This is especially true because the alpha coefficient for the entire scale is .82. As noted, intentions to drink are strongly related to future behaviors.

Future research is needed to explore the cross-sectional associations among the behavioral, intrapersonal, and socioenvironmental factors with alcohol intentions alone. In addition, longitudinal research that explores the associations of earlier behavioral, intrapersonal, and socioenvironmental factors with later behaviors is needed. This longitudinal research will allow for the creation of the groups of users and nonusers at earlier ages and for the exploration of how the behavioral, intrapersonal, and socioenvironmental factors influence alcohol behavior in each group.

In summary, it appears that the focus of Project Northland and PNC was appropriate for nonusers. The primary factors addressed in these interventions are the behavioral, intrapersonal, and socioenvironmental factors presented. Thus, it will be of interest to note which of the factors mediate subsequent alcohol use and the outcomes of the PNC intervention. Early users of alcohol, however, are already at very high risk in all domains, and thus earlier intervention is critical to alter these risk factors prior to sixth grade, while students are in their tweens, by particularly focusing on the risk factors that most strongly predicted use and were differentially distributed across users and nonusers. Although some research has been done in the primary prevention of developmental problems with tweens (Hawkins, Catalano, Kosterman, Abbott, & Hill, 1999), these data suggest that both a developmental focus and a specific focus on particular alcohol-related risk factors (e.g., outcome expectancies or normative estimates) are needed to affect those at highest risk for teen alcohol use.

IMPLICATIONS FOR PRACTICE

The results of this study suggest that all youth should receive prevention programs with specific messages about alcohol use prior to sixth grade. High-risk students should receive developmentally appropriate messages about academic achievement, conduct, and peer influence. Parent involvement in prevention programs is crucial, as parents are the primary socialization agents for members of this young age group. Specific components of a prevention program for tweens should address those risk and protective factors found to be most strongly related to early alcohol use and those that differentiate users from nonusers.

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Table 1
Distribution of Demographic, Behavioral, Intrapersonal, and Socioenvironmental Risk Factors Between Sixth Grade Users and Nonusers

	Users (<i>n</i> = 713) ^d		Nonusers (<i>n</i> = 3,437) ^d		Difference	<i>F</i>	<i>p</i>
	Estimate	Confidence Interval	Estimate	Confidence Interval			
Demographic factors							
% White	12.1	4.3, 19.9	12.4	6.5, 18.3	0.3	0.08	.77
% Black	40.6	24.9, 56.3	43.7	28.2, 59.4	3.1	4.77	.03
% Hispanic	29.7	16.0, 43.4	27.9	14.2, 41.6	1.8	1.50	.22
% Asian	2.7	-3.2, 8.6	6.3	0.4, 12.2	3.7	23.86	<.0001
% Native American	1.3	-0.6, 1.9	0.7	-0.04, 1.0	0.6	2.77	.10
% Mixed or Other	13.6	11.6, 15.6	8.9	6.9, 10.9	4.7	15.15	.0001
Gender (% female)	43.7	39.8, 47.6	51.4	49.4, 53.4	-7.7	13.95	.0002
% free or reduced lunch	65.4	57.6, 73.2	70.1	64.2, 76.0	-4.7	6.76	.009
% non-two-parent families	54.1	46.3, 61.9	47.1	39.3, 54.9	7.0	12.64	.0004
% speaking language other than English	27.0	15.2, 38.8	27.5	17.7, 37.3	0.5	0.11	.75
Time in country (# of years)	10.27	-19.1, 39.7	10.2	-15.3, 35.7	0.03	0.15	.70
Age (# of years) 1	11.95	6.1, 17.8	11.82	5.9, 17.7	0.12	26.44	<.0001
Behavioral factors							
Ever smoked ^b	31.4	29.4, 33.4	5.1	3.4, 7.1	26.4	541.27	<.0001
Past-month smoked ^b	6.3	5.5, 7.1	0.6	0.2, 1.0	5.7	123.21	<.0001
Past-year marijuana use ^b	18.7	16.7, 20.7	2.0	0.0, 4.0	16.7	402.56	<.0001
Past-month marijuana use ^b	10.4	8.4, 12.4	1.0	0.2, 1.8	9.3	220.58	<.0001
Feeling depressed ^b	80.5	76.6, 84.4	70.6	68.6, 72.6	9.9	29.36	<.0001
Own or collect alcohol items ^b	39.7	35.8, 43.6	16.0	14.0, 18.0	23.7	216.07	<.0001
Wear or use alcohol items ^b	70.4	66.5, 74.3	44.0	40.1, 47.9	26.4	171.48	<.0001
Violent behavior ^{b,c}	0.72	0.07	-0.14	0.07	0.86	544.79	<.0001
Delinquent behavior ^{b,c}	0.62	0.12	-0.12	0.05	0.74	359.49	<.0001
Behavioral (hourly) factors							
Ever smoked ^b	31.4	29.4, 33.4	5.1	3.4, 7.1	26.4	541.27	<.0001
Past-month smoked ^b	6.3	5.5, 7.1	0.6	0.2, 1.0	5.7	123.21	<.0001
Past-year marijuana use ^b	18.7	16.7, 20.7	2.0	0.0, 4.0	16.7	402.56	<.0001

	Users (<i>n</i> = 713) ^d		Nonusers (<i>n</i> = 3,437) ^d		Difference	<i>F</i>	<i>p</i>
	Estimate	Confidence Interval	Estimate	Confidence Interval			
Past-month marijuana use ^b	10.4	8.4, 12.4	1.0	0.2, 1.8	9.3	220.58	<.0001
Feeling depressed ^b	80.5	76.6, 84.4	70.6	68.6, 72.6	9.9	29.36	<.0001
Own or collect alcohol items ^b	39.7	35.8, 43.6	16.0	14.0, 18.0	23.7	216.07	<.0001
Wear or use alcohol items ^b	70.4	66.5, 74.3	44.0	40.1, 47.9	26.4	171.48	<.0001
Violent behavior ^{b,c}	0.72	0.07	-0.14	0.07	0.86	544.79	<.0001
Delinquent behavior ^{b,c}	0.62	0.12	-0.12	0.05	0.74	359.49	<.0001
Behavioral (hourly) factors							
Hours or day doing homework or studying ^{d,e}	2.72	0.04	2.83	0.03	-0.11	13.18	.0003
Hours or week spent in religious activities ^{d,f}	1.76	0.05	1.85	0.04	-0.09	5.87	.02
Hours or week spent outside school in sports and being physically active ^{d,f}	3.0	0.06	2.7	0.04	0.30	40.76	<.0001
Hours or week spent in after-school activities with adult supervision ^{d,f}	1.73	0.03	1.70	0.04	0.03	0.81	.37
Hours or day spent without adults ^{b,e}	2.1	0.07	1.7	0.04	0.44	33.96	<.0001
Intrapersonal factors							
Low self-efficacy ^{b,c}	0.79	0.04	-0.16	0.03	0.95	608.83	<.0001
Outcome expectancies ^{b,c}	0.58	0.04	-0.12	0.02	0.70	309.74	<.0001
Outcome expectations ^{b,c}	0.63	0.04	-0.13	0.02	0.75	363.20	<.0001
Socioenvironmental factors							
Alcohol offers ^{b,c}	0.48	0.04	-0.10	0.02	0.58	208.24	<.0001
Alcohol access ^{b,c}	0.62	0.05	-0.14	0.03	0.76	369.27	<.0001
Alcohol access ^{b,c}	0.62	0.05	-0.14	0.03	0.76	369.27	<.0001
Parental monitoring ^{b,c}	0.15	0.04	-0.03	0.02	0.18	19.99	<.0001
Parent-child communication ^{b,c}	0.24	0.05	-0.05	0.04	0.29	51.94	<.0001
Family alcohol discussions ^{b,c}	0.23	0.06	-0.05	0.05	0.28	48.81	<.0001
Normative estimates ^{b,c}	0.72	0.06	-0.14	0.05	0.85	496.43	<.0001
Normative expectations ^{b,c}	0.43	0.05	-0.08	0.03	0.51	161.67	<.0001

	Users (<i>n</i> = 713) ^d		Nonusers (<i>n</i> = 3,437) ^d		Difference	<i>F</i>	<i>p</i>
	Estimate	Confidence Interval	Estimate	Confidence Interval			
Peer alcohol use ^{b,c}	0.75	0.05	-0.15	0.04	0.90	547.41	< .0001

NOTE: *N* = 4,150. Degrees of freedom range from 1, 4047 to 1, 4127.

^aEstimates are generated from mixed effects regression models.

^bA higher score on item or multi-item scale indicates more risk.

^cScale scores from multi-item measures of these factors were standardized before being analyzed in the model.

^dA higher score on item or index indicates less risk.

^eResponse represents scale from 1 (*none*) to 5 (*5 or more hours*).

^fResponse represents scale from 1 (*none*) to 5 (*11 or more hours*).

Table 2

The Relationships Among Demographic, Behavioral, Intrapersonal, and Socioenvironmental Risk Factors and Alcohol Use Behavior and Intentions Among Sixth Grade Nonusers

	Single Regression Model ^{a,b}				Multiple Regression Model ^{a,c}			
	Estimate	SE	F	p	Estimate	SE	F	p
Demographic factors								
White	0.14	0.07	3.82	.05				
Black	-0.10	0.06	2.84	.09				
Hispanic	0.02	0.06	0.16	.69				
Asian	-0.26	0.11	5.72	.02				
Native American	0.42	0.28	2.24	.14				
Mixed or Other	0.07	0.08	0.76	.38				
Race					<i>ns</i>			
Gender (% female)	-0.27	0.05	35.17	< .0001	-0.06	0.04	2.54	.12
Free or reduced lunch	-0.06	0.05	1.16	.28	<i>ns</i>			
Non-two-parent families than English	0.11	0.05	5.10	.02	<i>ns</i>			
Speaking language other	-0.15	0.06	6.32	.01	<i>ns</i>			
Time in country (# of years)	0.02	0.01	3.32	.07	<i>ns</i>			
Age (# of years)	0.16	0.04	17.63	< .0001	<i>ns</i>			
Behavioral factors								
Ever smoked ^d	1.16	0.11	121.02	< .0001	0.29	0.09	10.56	.001
Past-month smoked ^d	1.27	0.29	19.45	< .0001	<i>ns</i>			
Past-year marijuana use ^d	0.94	0.09	103.88	< .0001	<i>ns</i>			
Past-month marijuana use ^d	1.30	0.13	95.83	< .0001	0.51	0.12	19.66	< .0001
Feeling depressed ^d	0.23	0.05	21.39	< .0001	<i>ns</i>			
Own or collect alcohol items ^d	0.93	0.06	229.94	< .0001	0.26	0.06	22.50	< .0001
Wear or use alcohol items ^d	0.85	0.04	364.98	< .0001	0.27	0.04	39.21	< .0001
Violent behavior ^{d,e}	0.52	0.02	535.27	< .0001	0.17	0.03	42.23	< .0001
Delinquent behavior ^{d,e}	0.40	0.02	320.74	< .0001	0.04	0.02	3.48	.06
Behavioral (hourly) factors								
Hours or day doing homework or studying ^{d,g}	-0.10	0.03	10.06	.002	<i>ns</i>			

	Single Regression Model ^{a,b}				Multiple Regression Model ^{a,c}			
	Estimate	SE	F	p	Estimate	SE	F	p
Hours or week spent in religious activities ^{f,h}	-0.04	0.01	12.67	.0004	-0.04	0.01	18.79	< .0001
Hours or week spent outside school in sports and being physically active ^{f,h}	0.03	0.01	24.00	< .0001	ns			
Hours or week spent in after-school activities with adult supervision ^{f,h}	0.01	0.01	1.68	0.19	ns			
Hours or day spent without adults ^{d,g}	0.03	0.01	6.23	.01	ns			
Intrapersonal factors								
Low self-efficacy ^{d,e}	0.53	0.02	627.68	< .0001	0.25	0.02	126.18	< .0001
Outcome expectancies ^{d,e}	0.39	0.02	303.14	< .0001	0.08	0.02	12.22	.0005
Outcome expectations ^{d,e}	0.43	0.02	386.56	< .0001	0.14	0.02	37.18	< .0001
Socioenvironmental factors								
Alcohol offers ^{d,e}	0.32	0.02	198.92	< .0001	0.11	0.02	31.39	< .0001
Alcohol access ^{d,e}	0.36	0.02	249.66	< .0001	ns			
Parental monitoring ^{d,e}	0.15	0.02	41.53	< .0001	ns			
Parent-child communication ^{d,e}	0.23	0.02	101.60	< .0001	0.05	0.02	6.37	.01
Family alcohol discussions ^{d,e}	0.20	0.02	75.31	< .0001	ns			
Normative estimates ^{d,e}	0.53	0.02	592.46	< .0001	0.23	0.02	107.30	< .0001
Normative expectations ^{d,e}	0.28	0.02	147.74	< .0001	0.04	0.02	3.25	.07
Peer alcohol use ^{d,e}	0.45	0.02	426.65	< .0001	ns			

NOTE: $n = 3,437$.

^aEstimates are generated from mixed effects regression models.

^bDegrees of freedom range from 1, 3342 to 1, 3412.

^cDegrees of freedom 1, 3279 before being analyzed in the model.

^dA higher score on item or multi-item scale indicates more risk.

^eScale scores from multi-item measures of these factors were standardized.

^fA higher score on item or index indicates less risk.

^gResponse represents scale from 1 (*none*) to 5 (*5 or more hours*).

^hResponse represents scale from 1 (*none*) to 5 (*11 or more hours*).

Table 3

The Relationships Among Demographic, Behavioral, Intrapersonal, and Socioenvironmental Risk Factors and Alcohol Use Behaviors and Intentions Among Sixth Grade Users

	Single Regression Model ^{a,b}				Multiple Regression Model ^{a,c}			
	Estimate	SE	F	p	Estimate	SE	F	p
Demographic factors								
White	-0.76	0.48	3.76	.05				
Black	0.38	0.35	0.58	.45				
Hispanic	-0.12	0.36	0.01	.91				
Asian	0.26	1.38	0.02	.88				
Native American	3.54	1.45	5.68	.02				
Mixed or Other	-0.18	0.48	0.05	.82				
Race					<i>ns</i>			
Gender (% female)	-0.70	0.33	4.19	.04	<i>ns</i>			
Free or reduced lunch	-0.10	0.35	0.00	.98	<i>ns</i>			
Non-two-parent families	0.28	0.33	0.57	.45	<i>ns</i>			
Speaking language other than English	0.38	0.37	1.38	.24	0.67	0.26	6.00	.01
Time in country (# of years)	-0.12	0.08	2.22	.14	<i>ns</i>			
Age (# of years)	1.20	0.25	21.33	< .0001	<i>ns</i>			
Behavioral factors								
Ever smoked ^d	3.07	0.34	94.07	< .0001	0.21	0.28	2.57	.11
Past-month smoked ^d	7.26	0.62	115.84	< .0001	1.59	0.53	5.59	.02
Past-year marijuana use ^d	2.49	0.14	232.12	< .0001	0.56	0.21	4.46	.04
Past-month marijuana use ^d	3.61	0.20	223.09	< .0001	1.59	0.29	13.85	.0002
Feeling depressed ^d	-1.24	0.41	6.01	.01	-0.89	0.29	6.73	.01
Own or collect alcohol items ^d	1.79	0.33	33.99	< .0001	<i>ns</i>			
Wear or use alcohol items ^d	1.62	0.36	25.90	< .0001	<i>ns</i>			
Violent behavior ^{d,e}	1.75	0.15	148.28	< .0001	0.31	0.14	8.91	.003
Delinquent behavior ^{d,e}	1.76	0.15	141.06	< .0001	0.42	0.15	6.08	.01
Behavioral (hourly) factors								
Hours or day doing homework or studying ^{d,g}	-0.37	0.21	4.17	.04	0.25	0.11	3.27	.07

	Single Regression Model ^{a,b}				Multiple Regression Model ^{a,c}			
	Estimate	SE	F	p	Estimate	SE	F	p
Hours or week spent in religious activities ^{f,h}	0.05	0.08	0.01	.94	<i>ns</i>			
Hours or week spent outside school in sports and being physically active ^{f,h}	0.09	0.05	3.51	.06	<i>ns</i>			
Hours or week spent in after-school activities with adult supervision ^{f,h}	0.15	0.08	1.35	0.25	<i>ns</i>			
Hours or day spent without adults ^{d,g}	0.31	0.09	13.15	.0003	<i>ns</i>			
Intrapersonal factors								
Low self-efficacy ^{d,e}	2.00	0.15	221.73	< .0001	0.64	0.14	29.99	< .0001
Outcome expectancies ^{d,e}	1.50	0.15	117.82	< .0001	<i>ns</i>			
Outcome expectations ^{d,e}	1.75	0.15	156.40	< .0001	0.40	0.13	13.42	.0003
Socioenvironmental factors								
Alcohol offers ^{d,e}	1.87	0.15	143.40	< .0001	<i>ns</i>			
Alcohol access ^{d,e}	1.84	0.15	158.42	< .0001	0.26	0.11	2.83	.09
Parental monitoring ^{d,e}	1.00	0.16	42.05	< .0001	<i>ns</i>			
Parent-child communication ^{d,e}	0.55	0.16	15.40	< .0001	<i>ns</i>			
Family alcohol discussions ^{d,e}	0.55	0.16	17.41	< .0001	<i>ns</i>			
Normative estimates ^{d,e}	1.92	0.15	177.16	< .0001	0.37	0.18	3.87	.05
Normative expectations ^{d,e}	1.57	0.15	120.00	< .0001	0.26	0.13	4.71	.03
Peer alcohol use ^{d,e}	2.18	0.14	230.90	< .0001	0.27	0.18	2.71	.10

NOTE: *n* = 713.

^aEstimates are generated from mixed effects regression models.

^bDegrees of freedom range from 1, 682 to 1, 690.

^cDegrees of freedom 1, 643 before being analyzed in the model.

^dA higher score on item or multi-item scale indicates more risk.

^eScale scores from multi-item measures of these factors were standardized.

^fA higher score on item or index indicates less risk.

^gResponse represents scale from 1 (*none*) to 5 (*5 or more hours*).
^hResponse represents scale from 1 (*none*) to 5 (*11 or more hours*).

Table 4
Description of Multi-Item Scales and Items Used To Measure Demographic, Behavioral, Intrapersonal, and Socioenvironmental Risk Factors

	Items	α	Range	Estimate ^a	Example of Item on Scale
Demographic factors					
Free or reduced lunch	1	—	0 to 1	69.3%	Do you receive free or reduced-price lunch at school?
Non-two-parent families	1	—	0 to 1	48.3%	Who do you live with most of the time?
Speaking language other than English	1	—	0 to 1	27.4%	What is the language most often spoken at home?
Time in country	1	—	0 to 11	10.2	How long have you lived in the US?
Age	1	—	10.3 to 15.5	11.8	Birth date
Behavioral factors					
Ever smoked ^b	1	—	0 to 1	9.6%	Have you ever smoked a cigarette?
Past-month smoked ^b	1	—	0 to 1	1.6%	During the last month, have you smoked a cigarette?
Past-year marijuana use ^b	1	—	0 to 1	4.9%	During the last 12 months, on how many occasions, or times, if any, have you used marijuana?
Past-month marijuana use ^b	1	—	0 to 1	2.7%	During the last 30 days, on how many occasions, or times, if any, have you used marijuana?
Feeling depressed ^b	1	—	0 to 1	72.3%	During the last month, how often have you felt sad or depressed?
Own or collect alcohol items ^b	1	—	0 to 1	20.0%	Do you own or collect anything that has the name of an alcoholic beverage on it?
Wear or use alcohol items ^b	1	—	0 to 1	48.5%	Would you ever wear or use an item that has the name of an alcoholic beverage on it?
Violent behavior ^{b,c}	6	.84	6 to 18	9.90	During the last month, how many times have you kicked, hit, or beat up another person?
Delinquent behavior ^{b,c}	7	.68	7 to 21	9.49	During the last month, how often have you stolen something from a store?
Behavioral (hourly) factors					
Hours or day doing homework or studying ^{d,e}	1	—	0 to 5	1.46	About how many hours in a day do you usually spend doing homework and studying?
Hours or week spent in religious activities ^{d,f}	1	—	0 to 11	1.63	About how many hours in a week do you usually spend attending services, groups, activities, or programs at a church, temple, synagogue, or mosque?
Hours or week spent outside school in sports and being physically active ^{d,f}	1	—	0 to 11	3.82	About how many hours in a week do you usually spend doing physical activities outside of gym class, such as team sports, drill teams, biking, walking, or skateboarding?
Hours or week spent in after-school activities with adult supervision ^{d,f}	1	—	0 to 11	1.33	About how many hours in a week do you usually spend in after-school clubs or groups with adult supervision?

Items	α	Range	Estimate ^a	Example of Item on Scale
Hours or day spent without adults ^{b,e}	—	0 to 5	1.73	1.85 About how many hours in a day do you usually spend without an adult around?
Intrapersonal factors				
Low self-efficacy ^{b,c}	.79	5 to 15	6.02	1.70 How sure are you that you could say "no" if you were offered alcohol by a friend?
Outcome expectancies ^{b,c}	.68	6 to 12	7.74	1.71 How important is it to you not to use alcohol if it would hurt your reputation or make you look bad.
Outcome expectations ^{b,c}	.68	5 to 25	8.01	3.42 If you were to drink alcohol, do you think you would lose a friendship?
Social-environmental factors				
Alcohol offers ^{b,c}	.77	2 to 6	2.14	0.55 During the last month, how many times have your friends asked you to drink alcohol?
Alcohol access ^{b,c}	.71	3 to 17	6.40	2.91 How hard would it be for you to get alcohol from your parent or guardian?
Parental monitoring ^b	—	1 to 5	1.58	1.01 How often does your parent or guardian ask you where you are going or who you will be with?
Parent-child communication ^b	.67	6 to 30	14.92	4.42 How often does your parent or guardian ask you about what you are doing in school?
Family alcohol discussions ^b	.77	2 to 15	7.60	3.57 How often does your parent or guardian talk with you about problems drinking alcohol can cause young people?
Normative estimates ^{b,c}	.62	3 to 15	7.28	2.60 How many people your age will drink alcohol by the time they are seniors in high school?
Normative expectations ^{b,c}	.53	3 to 15	5.49	2.22 How much do you agree with the statement "kids who drink alcohol are more grown-up"?
Peer alcohol use ^b	—	1 to 5	1.48	0.87 How many of your friends drink alcohol?

NOTE: $N = 4,150$.

^a Estimates consist of means or percentages with associated standard deviations or confidence intervals.

^b A higher score on multi-item scale or item indicates more risk.

^c See Komro, Perry, Munson, Stigler, and Farbaksh (2004) for more information

^d A higher score on item indicates less risk.

^e Response represents scale from 1 (none) to 5 (5 or more hours).

^f Response represents scale from 1 (none) to 5 (11 or more hours).