

## Alcohol Use among Adolescents

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### Abstract

Alcohol consumption is a major social problem throughout the US. This study seeks to identify the risk and protective factors associated with adolescent alcohol drinking by examining social psychological variables. Selected items from a baseline questionnaire for a two year drug prevention study were used to conduct bivariate and logistic regression analyses. Respondents (N=2787) were seventh graders in ten middle schools throughout Orange County. The results suggested that individuals with poor academic performance and a sensation seeking personality were the most likely to consume alcohol. Knowing the characteristics of those who are most likely to engage in alcohol use is a necessary step towards developing programs that aim to combat adolescent drinking.

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### Introduction

Alcohol use is a social problem in the United States that can affect people of all ages, from all backgrounds, and all social classes. As the third leading preventable cause of death in the United States, alcohol consumption is also responsible for several harmful health consequences (CDC, 2004). One aspect of particularly alarming concern within this social issue, is that of alcohol use by adolescents and teens (Kornblum & Julian, 2007). More specifically, alcohol is the main cause of death for people under 21 (NIAAA, 2005). Among adults, 21 or older, with reported alcohol dependence or abuse, 95% started drinking alcohol before age 21 (NSDUH, 2004). Those who begin drinking before the age of 15 are five times more likely to develop alcohol dependence or abuse later in life than those who do not drink before the legal drinking age of 21 (NSDUH, 2004). It is reported by federal health agencies that alcohol is historically and currently the most common substance used and abused by American youth (CDC, 2006; Johnston, O'Malley, Bachman, & Schulenberg, 2006; NIAAA, 2005). Therefore, it is very important to understand alcohol use at the early stage of one's life in order to prevent

the adverse social and health consequences. This study examined the prevalence of alcohol use and demographic factors and particularly explored the interaction between personality characteristics and gender in terms of alcohol use among culturally diverse early adolescence.

### Demographics and adolescent alcohol use

Demographic variables have been examined in numerous research studies as predictive risk factors to adolescent alcohol use. Previous studies show that individuals with certain demographic characteristics are more likely to use alcohol (Donovan, 2004; Kuntsche, Knibbe, Gmel, & Engels, 2006). In the most recent report of nationwide data, 41% of eighth graders and 73% of high school seniors reported alcohol consumption (Johnston et al., 2006). Research examining the association between alcohol use and gender, has produced conflicting results with some studies showing no gender effects (Epstein, Botvin, Diaz, T. & Schinke, 1995; Kosterman, Hawkins, Guo, Catalano, & Abbott, 2000) and others providing evidence for gender as a risk factor for alcohol use (Barnes, 2002; Wallace, Bachman, O'Malley, Schulenberg, Cooper, Johnston, 2002; Johnston et al., 2006). Studies indicate there is a positive relationship

between age and alcohol experimentation; as teens become young adults, the rate of alcohol use increases (Hawkins, Graham, Maguin,

Abbott, Hill, Catalano, 1997; Hingson, 2000; Johnston et al., 2007).

Table 1. Percentage of Alcohol Use by Demographic Variables (N=2,767)<sup>1</sup>

<i>Demographics</i>	<i>N</i>	<i>Alcohol Use in Past Week (%)</i>	<i>Alcohol Use in Past Month (%)</i>	<i>Alcohol Use in Entire Life (%)</i>
<b>Gender</b>				
Female	1442	11.1	12.8	31.6
Male	1300	14.1	15.4	35.8
p-value		(*)		(*)
<b>Ethnicity</b>				
Asian American	359	3.9	6.7	30.1
African American	36	19.4	8.3	36.1
Hispanic	1611	15.9	16.6	32.7
White	390	6.9	10.2	37.7
Native American	38	10.5	10.5	28.9
Mixed	248	12.5	17.3	40.3
Other	60	10.0	8.3	28.3
p-value		(***)	(***)	
<b>Language</b>				
Only English	1099	9.6	12.3	32.9
English more than another	728	14.2	17.7	37.0
English and another equally	753	14.7	14.4	33.2
Another more than English	129	17.8	14.7	31.0
Not English	31	6.3	6.5	6.5
p-value		(***)	(*)	(**)
<b>Grades</b>				
Mostly A's	798	6.3	9.0	31.3
Mostly B's	1089	11.8	15.1	36.1
Mostly C's	640	16.5	15.7	31.3
Mostly D's	136	21.3	17.6	36.8
Mostly F's	62	41.9	37.1	45.2
p-value		(***)	(***)	(*)

\*p < 0.05, \*\*p < 0.01, \*\*\*p < 0.001

<sup>1</sup>Note: Sample size differs slightly across columns due to missing data

**Gender**

Historically, substance use and abuse has been viewed as a problem that disproportionately impacts males more than females (Wallace et al., 2002). Many research studies support this perception with boys having higher rates of alcohol use, especially for heavy alcohol use and delinquency than girls (Barnes, 2002; Wallace et al., 2002; Monitoring the Future, 2006). Yet, recent research provides evidence that this trend

is changing especially in younger age groups, where prevalence rates for boys and girls are very similar (NIAAA, 2005), and differences in gender are becoming less of a risk factor in alcohol use (Donovan, 2004). Another recent study showed similar results for both genders among eighth graders, and furthermore females have surpassed the alcohol use of males in the tenth grade (Johnston et al., 2006).

### **Ethnicity**

The inclusion of ethnic differences in studying adolescent alcohol use was relatively recent to this field of study (Botvin & Schinke, 1997). Research and theories on the relationship between alcohol use and ethnic background is often controversial (Trimble, 1997). Previous research suggests that adolescents with an Asian background are less likely to use alcohol compared to other ethnic groups (Donovan, 2004; Au & Donaldson, 2000; Wallace et al., 2002). However, recent epidemiological studies contest that drinking rates are increasing among Asian-American young adults (Hendershot, Dillworth, Neighbors, George, 2008). African American adolescents also have lower rates of alcohol use when compared to Whites (Donovan, 2004; Johnston et al., 2006). The highest rates of alcohol use can be seen among Hispanic, White, and Native American adolescents (Johnston et al., 2006; Wallace et al., 2002).

### **Language**

The level of acculturation has been identified as an influential factor in alcohol use among adolescents. In many previous studies, the measure of acculturation into American society is defined through language use in relation to media outlets, i.e., movies, television, and radio (Unger, Weiss, Jim, etc). Previous research suggested significant association between acculturation and alcohol use (Gil, Wagner, & Vega, 2000, more citations are needed). Specifically, there is a positive relationship between acculturation and alcohol use; as acculturation increases, so does alcohol use (Bhattacharya, 2002; Epstein, Botvin, & Diaz, 2000; Gil et al., 2000). The interpretations of this phenomenon vary; nonetheless this is seen as a critical variable that requires more research (Gil et al., 2000).

### **Personality and adolescent drinking**

Research studies have suggested that alcohol use behaviors may be influenced by personality traits (Smith & Anderson, 2001). More specifically, previous research suggests that one's temperament is associated with adolescent alcohol use, in that those who are impulsive, sensation seeking, have low inhibitory control,

and tend to focus on the rewards are more likely to use alcohol (Colder & Chassin, 1997, Kuntshe et al., 2004; Carver & White, 1994). Other research studies have suggested that there is a significant impact of impulsivity on alcohol use (Colder & Chassin, 1997; Hair & Hampson, 2006; von Diemen et al., 2008) while other research indicated the relationships between impulsivity, alcohol use, anti-social and violent behaviors (Case, 2007; Eklund & Klinteberg, 2005). Another study yielded results suggesting that impulsivity is a significant predictor for motives associated with drinking (see review in Kuntshe et al., 2004). Yet, when additional personality factors such as neuroticism and extraversion were accounted for, impulsivity no longer proved to be a significant predictor (Kuntshe et al., 2004).

While many previous studies investigated various risk factors and personality traits associated with alcohol use among youth as a whole group, it is important to explore risk factors associated with alcohol use in adolescent girls and boys separately and to examine in depth on potential vulnerabilities of alcohol use by gender. Findings from previous studies indicated that certain biological (i.e., genetic risk, neurological abnormalities) and psychosocial (i.e., impact of positive drinking expectancies and deviance proneness) factors appear to impact boys and girls similarly (Schulte, Ramo, & Brown, 2009). In contrast, physiological and social changes particular to adolescence appear to differentially affect boys and girls as they transition into adulthood. Specifically, boys begin to manifest a constellation of factors that place them at greater risk for disruptive drinking: low response to alcohol, later maturation in brain structures and executive function, greater estimates of perceived peer alcohol use, and socialization into traditional gender roles. Although there is much evidence indicating association between personality trait of sensation seeking, aggression and alcohol use, little information is available on interaction effect between personality and gender on alcohol use among youth (Chaplin, Hong, Bergquist, & Sinha, 2008; Lemke, Schutte, Brennan, & Moos, 2008; Yang & Coid, 2007).

The goal of this study was to examine the differences in adolescent alcohol use across demographic variables such as gender, ethnicity, language use, and academic performance. In addition, this study explored the association between alcohol use and personality characteristics such as inhibition, impulsivity, sensation seeking, and arousal as well as the interaction effect between personality characteristics and gender on alcohol use.

## Methods

### Participants

Ten school districts, which included middle or junior high schools, in Orange County, California, were approached to participate in this study. Four school districts, with a total of ten junior high schools, agreed to participate. The participating districts were considered to be representative across socio-economic statuses with the schools in high, middle, and low income areas. Of 4,169 seventh grade students who were approached from the ten participating schools, 2,918 (70%) agreed to participate in the study. All of the students who were surveyed submitted a signed parental consent form and student assent before participating. The sample consisted of 2,789 students who were in attendance at the time of the survey and provided consent.

The mean age of the participants was 12.6 years (SD=2.0 months). The sample for this study included students of both genders, of which females equaled 52%. The reported ethnic background of the students was 59% Hispanic, 14% White, 13% Asian American, 9% Mixed, 2% Others, 1% Native American, and 1% African American. The sample presented in this study was considered to be representative of the student population in Orange County in terms of ethnicity. According to the Orange County Department of Education the largest ethnic group represented in the county was Hispanic during the 2005-2006 academic school year. The second largest ethnic group in Orange County was Whites, followed by Asian students (2006).

### Procedures

This study was partially supported by the National Institute on Drug Abuse, and it was conducted by the Department of Health Sciences at California State University, Fullerton. Formal approval from the California State University, Fullerton Institutional Review Board was granted prior to the start of this study. The data was collected either in a classroom setting, gymnasium, or multipurpose room during a single class period. The survey lasted approximately 45 minutes. The survey was administered by trained research staff and assistants during regular school hours. To ensure confidentiality, students were instructed not to write their names on the surveys, and assured that individual survey information would not be shared with anyone, including parents, teachers, peers, and law enforcement. Honest answers were encouraged throughout the administration of the survey.

The students who submitted parental consent and student assent forms completed a 75-item paper-and-pencil questionnaire. Only a portion of the items from the questionnaire were analyzed for the purposes of the current study. Upon the completion of the survey, each student was given a \$5 target gift card as an appreciation of their participation.

### Measures

#### Alcohol use

To assess alcohol use, three measures were used: 1) 7-day frequency, 2) 30-day frequency, and 3) lifetime usage. The 7-day frequency item asked students to report their alcohol use "in the past week." Eight response categories ranged from 0 to 7 days. The 30-day frequency item asked students to report their alcohol use "in the past month." Eight response categories ranged from 0 days to 1-5 days up to 30+ days, in five-day increments. The lifetime usage item asked students to report their overall alcohol usage "in their entire life." For each of the three questions, responses ranged from 1 = 0 times to 8 = 30+ times, in increments of five. Each of these questions were dichotomized so that 0 = non-

drinkers (0 times) and 1 = drinkers (1 or more times). The majority of students who reported alcohol consumption indicated they drank 1 day in the past week (57%), 1-5 days in the past month (70%), and 1-5 times in their entire life (73%). Hence, students who chose "0" were recoded as "no use" and students who chose 1 or more were recoded as "use." The three measure of alcohol use were analyzed as dichotomous variables. The alcohol items were selected from previous research of the National Household Survey on Drug Abuse (Faden, 2006) and the Alcohol Expectancy Questionnaire (Leigh & Stacey, 1993).

### **Personality**

An eighteen-item likert scale was used to measure personality types. These items originated from Carver and White's (1994) influential work on Behavioral Inhibition Systems (BIS) and Behavioral Activation Systems (BAS). All items had four responses, ranging from "strongly disagree" to "strongly agree," and no neutral option. This scale contained four subscales tapping into different personality types: inhibition, impulsivity, sensation seeking, and arousal potential.

The items in the Behavioral Inhibition Systems measured individuals' reaction to the threat of punishment and perceived negative consequences associated with their behavior (Carver & White, 1994). Examples of the items in this scale were "I worry about making mistakes" and "I feel worried or upset when I think or know somebody is angry with me." Conversely, the items in the Behavioral Activation Systems measured individuals' reaction to the possibility of rewards associated with their behavior (Carver & White, 1994). Examples of items in the impulsivity scale were "When I want something, I usually try really hard to get it" and "If there's a chance to get something I really want, I will go get it right away." Examples of items in the sensation seeking scale were "I'm always willing to try something new if I think it will be fun" and "I often do things without thinking about the consequences." Examples of items in the arousal potential scale were "When good things happen to me, it strongly affects me" and "I would be

excited if I won a contest." The obtained Cronbach alpha for the whole scale was 0.75. The obtained Cronbach alpha for the four subscales were: 0.74 for inhibition, 0.57 for impulsivity, 0.68 for sensation seeking, and 0.82 for arousal potential.

Demographic variables were composed of four variables: gender, ethnicity, primary language, and academic performance. The measure of language asked "What language(s) are the movies, TV, radio shows you like to watch and listen to?" Five response items were provided for this item: 1) only English, 2) English more than another language, 3) English and another language equally, 4) another language more than English, and 5) only another language (not English).

### **Data Analysis**

Descriptive statistics, such as frequencies, percentages, means, and standard deviations were conducted to describe the sample and the alcohol use. To test differences among demographic variables and the three measures of alcohol use, chi-square analyses were performed. T-test analyses were run to examine the mean differences between alcohol users and non-users for each of the personality subscales. Logistic regression analysis was conducted to assess the association between alcohol use with demographics and personality types. To establish the appropriateness of applying logistic regression analysis to this data set, a model fit was assessed by examining the Hosmer and Lemeshow test (Hosmer and Lemeshow, 2000). Results that were insignificant for this test,  $p > 0.05$ , indicated a good fit of the model. SPSS version 15.0 was used to perform the statistical analyses.

## **Results**

### **Demographic variables and alcohol use**

Table 1 presented the chi-square analysis and percentages of those who reported drinking across the three measures of alcohol use within each of the demographic variables. All of the demographic variables were significant on at least two of the alcohol use measures. Male students reported slightly higher alcohol use than females. Fourteen percent of males reported

using alcohol in the past week compared to 11% of females. Fifteen percent of males reported using alcohol in the past month compared to 13% of females. Similarly, 36% of males and 32% of females drank alcohol at some point in their lives.

There were ethnic differences in alcohol use. For these variables, African Americans had the highest rates of alcohol use, while Asian Americans had the lowest rates. There were no significant ethnic differences in lifetime alcohol use. In more detail, Hispanic students reported higher usage in the past week (16%) and in the past month (17%). Mixed students, being from two or more ethnic backgrounds, reported the highest usage in the past week (13%), past month (17%) and lifetime use (40%). Asian American students consistently reported a low percentage of alcohol use in the past week (4%), the past month (7%), and their entire life (30%). Due to the low sample sizes for African American, Native American, and Other categories the results presented should be

analyzed with caution.

Students who reported watching and listening to media outlets in English and another language had a higher percentage of alcohol use compared to those who reported watching and listening to media only in English and who reported only another language (not English). Due to the low sample size for students who reported only another language (not English) usage via the media, results should be analyzed with caution.

As presented in Table 1, there was a negative relationship between alcohol use and academic grades; as a student's school grades decreased, their alcohol use percentage increased. Students who reported receiving mostly A's in school had the lowest percentage of alcohol use in the past week (6%), the past month (9%) and entire life (31%). The highest percentages of use alcohol across the three measures were found among students who receive mostly D's (21%, 18%, and 37%) and mostly F's (42%, 37%, and 45%).

Table 2. Mean personality scores across the three alcohol measures (N=2,767)<sup>1</sup>

	<i>Alcohol Use</i>								
	Past Week			Past Month			Entire Life		
Personality Types <sup>2</sup>	No Use	Use	p-value	No Use	Use	p-value	No Use	Use	p-value
Inhibition	19.3	18.5	***	19.3	18.2	***	19.3	18.9	**
Impulsivity	5.8	5.8		5.8	5.7		5.7	5.9	***
Sensation Seeking	10.8	11.8	***	10.8	11.9	***	10.6	11.5	***
Arousal Potential	13.7	13.6		13.7	13.7		13.7	13.7	

\*p<0.05, \*\*p<0.01, \*\*\*p<0.001

<sup>1</sup> Note: Sample size differs slightly across columns due to missing data.

<sup>2</sup> The "Arousal Potential" personality type was excluded because there were no significant differences.

**Personality and alcohol use**

Table 2 presented means for the personality scales across the three alcohol measures. Significant mean differences among non-users and users were illustrated for the inhibition, sensation seeking, and impulsivity subscales, but not for arousal potential subscale. Across all three alcohol measures, past week, past month, and entire life, the mean level of inhibition was significantly lower for those who reported alcohol use compared to those who reported no

alcohol use. In the contrast, across all three alcohol measures, the mean scores of sensation seeking were significantly higher among those who reported alcohol use compared to those who reported no alcohol use. On the impulsivity scale, there was a significantly higher mean on the lifetime alcohol use for those who reported alcohol use relative to the no-users.

Table 3 presented the logistic regression analysis of each alcohol measure by each demographic

variable and the two personality subscales that yielded the most significant results, inhibition and sensation seeking. Gender was not significantly associated with any of the alcohol use measures. Language was significant ( $p < 0.01$ ) for the lifetime alcohol use measure. The results showed that, adolescents who reportedly watch and listen to the media in English and another language are more likely to have used alcohol in their entire life compared to those accessing the media only in English.

Table 3 also illustrated the association between academic performance and personality with adolescent alcohol use. The student's reported grades were significantly predicted past week ( $OR = 1.5$ ,  $p < 0.001$ ) and past month ( $OR = 1.3$ ,  $p < 0.001$ ) alcohol use. Both of the personality subscales, inhibition and sensation seeking were

significantly associated with all of the alcohol use measures. Students who were more inhibited were less likely to drink alcohol (past week ( $OR = 0.9$ ,  $p < 0.001$  for past week,  $OR = 0.9$ ,  $p < 0.001$  for past month, and  $OR = 0.9$ ,  $p < 0.001$  for the entire life), whereas students with sensation seeking personality characteristics were more likely to use alcohol ( $OR = 1.2$ ,  $p < 0.001$  for past week,  $OR = 1.3$ ,  $p < 0.001$  for past month, and  $OR = 1.2$ ,  $p < 0.001$  for entire life). In addition, Table 3 demonstrated interaction between sensation seeking and gender in terms of alcohol use. The significant sensation seeking X gender interaction term for all 3 measures of alcohol use indicated that sensation seeking was associated with increases in alcohol use among male students ( $p < .0001$ ).

Table 3. Association between Alcohol Use, Demographic Variables and Personality Types

	Alcohol Use					
	Past Week (N=2491)		Past Month (N=2484)		Entire Life (N=2484)	
	OR (95% CI)	p-value	OR (95% CI)	p-value	OR (95% CI)	p-value
Gender <sup>1</sup>	1.2 (0.9, 1.5)		1.1 (0.8, 1.3)		1.2 (1.0, 1.4)	
Ethnicity <sup>2</sup>		**		**		*
African American	0.5 (0.2, 1.4)		1.0 (0.3, 3.2)		1.5 (0.8, 3.0)	
Hispanic	1.7 (0.5, 6.5)		0.6 (0.1, 3.8)		1.5 (0.5, 3.9)	
White	1.4 (0.6, 3.7)		2.3 (0.8, 6.6)		1.5 (0.8, 2.8)	
Native American	0.8 (0.3, 2.3)		1.5 (0.5, 4.5)		2.1 (1.1, 4.1)	
Mixed	1.0 (0.2, 4.8)		1.3 (0.3, 6.5)		1.4 (0.5, 3.8)	
Other	1.5 (0.5, 4.1)		2.8 (0.9, 8.2)		2.4 (1.2, 4.8)	
Language <sup>3</sup>						**
English more than another	1.3 (0.3, 5.6)		1.4 (0.3, 6.4)		4.0 (0.9, 17.2)	
English and another equally	1.8 (0.4, 8.1)		2.0 (0.5, 8.9)		5.7 (1.3, 24.7)	
Another more than English	1.8 (0.4, 8.0)		1.5 (0.3, 6.7)		4.7 (1.1, 20.4)	
Not English	2.5 (0.5, 10.5)		1.7 (0.4, 8.2)		4.5 (1.0, 20.4)	
Grades <sup>4</sup>	1.5 (1.3, 1.7)	***	1.3 (1.1, 1.4)	***	1.1 (1.0, 1.2)	
Personality						
Inhibition	0.9 (0.9, 1.0)	***	0.9 (0.9, 0.9)	***	0.9 (0.9, 1.0)	***
Sensation Seeking	1.2 (1.1, 1.3)	***	1.3 (1.2, 1.4)	***	1.2 (1.1, 1.2)	***
Interaction						
Inhibition x Gender	1.00 (0.99, 1.01)		0.9 (0.98, 1.00)		1.00 (0.99, 1.01)	
Sensation Seeking x Gender	1.05 (1.03, 1.06)	***	1.05 (1.03, 1.06)	***	1.04 (1.03, 1.05)	***

\* $p < 0.05$ , \*\* $p < 0.01$ , \*\*\* $p < 0.001$

<sup>1</sup>Reference category is female; <sup>2</sup>Reference category is Asian American female; <sup>3</sup>Reference category is only English;

<sup>4</sup>Reference category is A's

## **Discussion**

This study examined the associations between alcohol use, demographic variables and personality characteristics among early adolescence. The main findings were as follow: poor academic performance proved to be a major factor in adolescent alcohol use. The language a student used to watch and listen to the media was associated with their alcohol use. Participants who defined themselves as sensation/fun seeking were more likely to drink alcohol.

The results for gender are consistent with nationwide trend data, in which the gap between the prevalence alcohol rates among boys and girls has narrowed over time (Wallace et al., 2003; more citations are needed). Based on this study gender is not considered to be an influential factor in adolescent alcohol use. The notion regarding alcohol use as being a male-dominated issue is shifting; female and male adolescents are equally likely to engage in alcohol use. Thus, prevention and intervention measures should be aimed at both genders equally.

Our findings for ethnic differences in alcohol use were consistent with previous studies, in that Asian American students were least likely to use alcohol, with students from Hispanic, White and Mixed ethnic backgrounds being the most likely to use alcohol (Wallace et al., 2003; more citations are needed). White students had relatively low rates of alcohol use in the past week and month, but a high percentage of use in their entire life. These results may suggest that their use was only incidental and based on experimentation. Conversely, the alcohol use rates for Hispanic students was mostly in the past week and month. These findings may suggest more serious and more frequent drinking behaviors. Mixed students had a high percentage of drinking for all of the alcohol use measures. The outcome for mixed students was interesting and further study is needed to obtain a full understanding of the phenomenon. These findings suggest that prevention and intervention programs should be more tailored towards the at-higher risk ethnic groups.

Findings of this study indicated that the language a student uses to watch and listen to the media was associated with their alcohol use. The inclusion of language as a variable provides insight into acculturation among minority groups and its impact on alcohol use. The construct of acculturation in this study was measured via participants' preference for the language of the media they follow. Results of this study indicated that students who watch and listen to the media in more than one language, for example, English and another language are more likely to use alcohol. Consistent with previous studies, this research suggested that less acculturation, measured through language, was associated with greater adolescent alcohol use (Gil, Wagner & Vega, 2000). These results suggest that the materials and information taught in intervention and prevention programs should be provided in more languages than just English. Anti-drinking messages promoted via the media must move beyond using only English to convey their messages. Media outlets should implement bilingual or multi-lingual translations to reach a broader and more at risk population.

The inverse relationship between academic performance and alcohol use was observed in this study. This is supported by other research findings (Cox et al., 2007; Diego et al., 2003; Sutherland & Shepherd 2001). Unfortunately, it was not clear which aspect comes first; does low academic performance make a student more at risk for alcohol use or is it the alcohol use that leads to the poor academics? Longitudinal study is warranted to provide this information. Regardless of the sequence, individuals with low academic performance should definitely be targeted for prevention and intervention programs.

In terms of personality types, our results are consistent with previous research, in that adolescents who exhibit a higher level of inhibition are less likely to drink while adolescents who tend to be more sensation seeking have a higher likelihood of drinking (Comeau et al., 2001; Colder & Chassin, 1997). In an attempt to curb their likelihood to engage in risky behaviors, prevention and intervention programs can teach these individuals to be more



aware of the consequences related to alcohol use. An interesting finding of this study was the significant interaction between sensation seeking and gender in terms of alcohol use. Our results indicated that sensation seeking was associated with increases in alcohol use among male students but not among female students. This finding illustrates the importance of distinguishing gender differences in certain personality traits and its impact on alcohol use among youth. This may provide insights into factors that may help explain differences in male's and female's paths to alcohol use. More broadly, this finding can potentially inform public health policy and clinical efforts to more effectively prevent and intervene male's and female's problems with alcohol use.

### **Limitations**

Several limitations of this study should be noted. The first was the limitation of studying ethnicity based on one survey question, that is, the compiling of largely diverse ethnicities into broad categorical variables, such as 'white' and 'Asian American' (Wallace et al., 2003). In the category for Asian American, there maybe a great deal of variation within subgroups of Asian Americans, i.e., Japanese versus Pilipino, that this study was unable to capture and analyze. In addition, ethnic differences may be more evident and prevalent among peer groups with diverse ethnic backgrounds.

The second limitation pertains to the validity and reliability of self-reporting alcohol use in the survey data. The recall memory of those who reported alcohol use may be inaccurate depending on the actual frequency of the event (Schwartz, 1999). The more frequent the behavior the less likely the respondent is to accurately calculate the numerical occurrence of the behavior (Schwartz, 1999). Lifetime estimates may be considered underestimates due to forgetting or failure to make cautious estimates for extended time intervals (Bachman

& O'Malley, 1980). Hence, this should be taken into account when considering the data for two of the alcohol measures, 'past month' and 'entire life'.

The third limitation of this survey was found in its ability to generalize to the population of adolescents across the country. Participants in this study were from ten different schools; however, all of the schools were located in the suburbs of one county. Generalizations may be limited to samples with a similar demographic makeup in other suburbs. The findings for particular ethnic groups, such as African Americans, Native Americans, and Other should be interpreted carefully due to the low representation in each category.

### **Implication**

The vast majority of research on the drinking behaviors of youth was conducted on students from junior high school to college. With nearly half of eighth graders reporting alcohol use and with trend data indicating steady increases throughout high school and college, additional research efforts ought to focus on younger-aged students, if such research is to earnestly aid prevention programs (Donovan, 2004). The research presented in this paper along with existing studies provides an illustration of protective and risk factors associated with adolescent drinking. The more research and understanding that is gained in this regard, the more effective and meaningful intervention and prevention measures will be in combating the problem. The findings presented in this study are useful and necessary in effecting policy changes within this population.

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