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The Normative Environment for Substance Use Among American Indian Students and White Students Attending Schools On or Near Reservations

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Keywords

adolescents; American Indians; alcohol use; marijuana use; inhalant use; public schools; tribal schools; Bureau of Indian Education schools

Significantly more attention has been paid recently to the role of norms in influencing adolescent substance use, and the targeting of normative factors has become a popular approach to substance use prevention (Berkowitz, 2004). The underlying premise is that the perception of how others think and act in regard to substance use has a significant influence on one's own substance use behavior. Indeed, consistent findings have pointed to a key role of peers and parents in providing norms for substance use and modeling attitudes and behaviors related to use (Bahr, Hoffmann, & Yang, 2005; Beck & Treiman, 1996; Callas, Flynn, & Worder, 2004; Duncan, Duncan, & Strycker, 2006; Van der Vorst, Engels, Meeus, & Dekovic, 2006; Windle, 2000).

The concept of norms as refined by Cialdini, Reno, and Kallgren (1990) differentiates between descriptive and injunctive norms. *Descriptive norms* refer to individuals' perceptions about the prevalence of a specific behavior in a particular population, usually one's peers. *Injunctive norms* are, on the other hand, the perceived level of approval of the behavior. These norms can differ significantly for an individual, depending on the referent group for the norms. For example, it is possible for individuals to believe that many of their peers engage in a behavior, while at the same time they may believe that these same peers, or more likely, other social referent groups such as their parents, would disapprove of their engaging in the behavior.

Both types of norms have been found to be independently predictive of alcohol and marijuana use (Borsari & Carey, 2001; Larimer, Turner, Mallett, & Geisner, 2004; Neighbors, Lee, Lewis, Fossos, & Larimer, 2007). In addition, injunctive norms have been found to moderate the relationship between substance use and descriptive norms (Lee, Geisner, Lewis, Neighbors, & Larimer, 2007; Neighbors, Geisner, & Lee, 2008; Rimal & Real, 2005). After finding significant relationships between descriptive and injunctive norms and college students' marijuana use, Neighbors et al. (2008) reiterated the importance of distinguishing between injunctive and descriptive norms in predicting college students' marijuana use.

Although research has examined the relationships between descriptive and injunctive norms and youth substance use, it has not, in general, examined how these norms differ across

groups of adolescents. Yet, understanding differences in norms can give insight into how and why substance use rates might differ among groups, in addition to suggesting how those norms can change through intervention. In this study, we examine the normative environment for a sample of students who self-identify as either American Indian (AI) or White, and attend the same schools on or near an AI reservation. This study is important for several reasons. Although considerable research effort has been devoted to the investigation of differences in the rates of substance use and risk factors across various racial and ethnic groups of adolescent youth (Delva et al., 2005; Wallace, Jr. et al., 2003; 2009), typically comparisons of norms across racial and ethnic groups do not include AI youth. One exception is an early study in which AI adolescents who were temporarily living in a community (for a job-training program) were more permissive of substance use compared to AI youth and non-AI youth who were residents of that community (Sellers, Winfree, & Griffiths, 1993).

Understanding the normative environment for substance use among AI youth residing on or near reservations is especially important given their comparatively high rates of substance use. Comparing substance use rates across reservation-based AI youth (Beauvais, Jumper-Thurman, & Burnside, 2008; Beauvais, Jumper-Thurman, Helm, Plested, & Burnside, 2004) and youth surveyed by Monitoring the Future, the annual school-based survey completed by middle and high schools students (MTF; Johnston, O'Malley, Bachman, & Schulenberg, 2008) for a 13-year period (1993-2005) shows that differences in substance use between these groups has been, at times, dramatic. For example, among eighth-grade students across these years, the mean prevalence rate of alcohol use in the previous 30 days was 22.4% for MTF compared to 36.5% for AI students. The comparative rates for getting drunk in the last 30 days are even more dramatic among eighth graders, with nearly 3 times as many AI eighth graders reporting having gotten drunk (21.7%) as compared to MTF eighth graders (7.8%). Results for marijuana use are even more striking for this same time period. Nearly four out of 10 reservation-based AI eighth graders reported use of marijuana in the last 30 days (39.3%) as compared to 8.5% of MTF eighth graders. Even at 12th grade, after many AI students have left school, more than twice as many have used marijuana in the last month (43.0%) compared to MTF 12th graders (21.0%). For inhalant use, 7.6% of native eighth-grade youth reported use in the last month compared to 4.9% of MTF eighth graders. By 12th grade, the rates are comparable (2.2% native vs. 2.1% MTF).

In the current study, we compared levels of descriptive and injunctive norms for three substance use behaviors (alcohol, marijuana, and inhalants) by grade level, sex, and ethnicity. By comparing students who attend the same schools, who live either on reservations or near the border of a reservation, we were able to control for, at least in part, geographic factors and some of the socioeconomic factors that may impact differing levels of social influence. Because parents and peers serve as two of the primary socializing influences for adolescents (Dishion, Nelson, & Bullock, 2004), injunctive norms were separated into two variables, one for adult injunctive norms and the other for peer injunctive norms.

Little past research points to how the normative environment for use of each substance might differ by grade, sex, and ethnicity. However, we hypothesized that descriptive norms (perceived prevalence) would be greater at higher grade levels, whereas injunctive norms (perceived disapproval) among peers would be lower at higher grade levels. In addition, we hypothesized that descriptive norms would be higher for AI youth compared to White youth given the historically consistent finding of higher levels of use among AI youth. Additionally, both student and adult injunctive norms were hypothesized to be higher among White youth as compared to AI youth.

Method

Participants

The data for this study were obtained from an ongoing study of the epidemiology of drug use among AI youth from schools on or near reservations that have at least 20% AI youth enrolled. The sampling scheme is based on seven geographic regions in which AIs reside (Northwest, Northern Plains, Northeast, Southeast, Southern Great Plains, and Southwest) with recruitment in each region to approximate the percentage of AIs residing in each respective region. As an incentive to participate, schools are paid \$500 for participation and given a comprehensive report on survey findings related to substance use within 2 months of survey completion.

For the school year 2009-2010, a total of 17 schools were surveyed that were located in Washington, Oregon, Montana, Arizona, North Dakota, South Dakota, Minnesota, and Wisconsin. All schools had at least 24% AI students enrolled and both reservation and near-reservation schools included both White and AI students. Fourteen of the schools were located within the boundaries of seven AI reservations. Three schools enrolled students from nearby reservations. Seven schools were public schools, four were Bureau of Indian Education schools, and the remaining were tribal schools. Our long-standing policy with each tribal group we survey is to keep the specific identity of reservations and tribes confidential, but we provide general geographic information to help describe the sample.

Because the primary purpose of this study was to compare AI and White youth, students who self-identified on the survey as AI or White were included in the sample. All participating schools had both AI and White students with percentages ranging from 17 to 96 % for AIs and 4 to 58 % for Whites. While students did self-report as other ethnicities (students were able to choose from eight options, such as “African-American or Black” and “Latino or Hispanic”), there were insufficient numbers of these groups to use for comparative purposes. Eighth-, 10th- and 12th- grade students are included for this analysis. A total of 497 AI and 478 White students were surveyed in these grades. Table 1 presents the breakdown of students by ethnicity, sex, and grade.

Procedure

The Colorado State University IRB approved all survey procedures. In addition, prior to proceeding with an agreement to survey, a resolution of support was required from the appropriate tribal authority or school board. At each school, a staff member was required to receive certification by successfully completing online and telephone IRB training prior to survey administration. This staff member was then responsible for supervising all survey administration procedures and providing notification of any discrepancies in proper procedure. Parents were informed through two separate avenues of the survey administration – a parent notification letter and a broad media release. If they did not want their child to participate, they were instructed to sign the notification to withdraw and return it to the school or call the school’s principal and request verbally that their child be withdrawn from participation. Less than 1% of students did not complete the survey because of a lack of parental consent.

Prior to survey distribution, teachers or other school staff read a brief set of instructions to the students, including telling students that their participation was voluntary and that they could leave any question blank if they did not wish to answer it. Students were given the class period to complete the survey. The surveys contained no identifying information, and the procedures used for giving and collecting the surveys ensured complete anonymity and confidentiality. Students for whom parental consent was denied were sent to an area away from survey administration. Once students were finished with the survey, they randomly

placed the completed form in a large envelope which was sealed (once all students handed in their surveys) and returned to our Center for optical scanning.

Prior to scanning, surveys were visually inspected for stray marks or evidence of random responding. Typically, less than 1% of surveys was unusable. Surveys were then scanned and were run through 40 different computerized checks that profiled inconsistent responders and exaggerators. A total of 2.6% of surveys was not included in the final sample based on the results of these profiles.

Measures

Students completed the American Drug and Alcohol Survey™. This survey has been refined for use with AI youth and has been validated for use across majority and various other ethnic minority groups (Oetting & Beauvais, 1990).

Descriptive norms for each substance were measured by two-item scales (one each for alcohol, marijuana, and inhalants). The first item began with the stem, "Thinking about your classmates, how often do you think the average student ..." This was followed by three questions, one for each substance ("gets drunk in a month," "uses marijuana in a month," "sniffs inhalants in a month"). For each of these questions, there were five response categories (*never, 1 time, 2-4 times, 5-9 times, 10 or more times*). The second question for each scale began with the stem, "How many of your classmates ..." ("get drunk at least once a month," "use marijuana at least once a month," "sniff inhalants at least once a month"). The five response categories for this question were *none, a few, less than half, more than half, and almost all*. Higher scores reflected higher levels of descriptive norms. The Cronbach alpha reliability for these two-item scales was .80 for alcohol, .84 for marijuana, and .80 for inhalants.

Student injunctive norms were measured with a single item for each substance, asking students to indicate their level of agreement with the statements: "Most students think it is wrong for other students to ... (get drunk, use marijuana, sniff inhalants)." Similarly, adult injunctive norms were measured with a single item for each substance that asked students to indicate their level of agreement with the statement: "Most adults think it is wrong for students to ... (get drunk, use marijuana, sniff inhalants)." The five response categories for these questions ranged from *strongly agree* to *strongly disagree*. Higher scores reflected more perceived (student or adult) disapproval or, in other words, higher levels of injunctive norms. Demographic data were gathered at the beginning of the survey and included grade, age, ethnicity, and gender.

Data Analyses

For each type of norm (e.g., descriptive), there are three dependent measures – one for each substance (alcohol, marijuana, and inhalants). These three measures are correlated with reasonably high estimates, ranging from .43 to .78 for descriptive norms, .45 to .78 for student injunctive norms, and .71 to .82 for adult injunctive norms. Furthermore, the three dependent measures of substance use for each type of norm are conceptually related, warranting the use of MANOVA in a 3 (grade) $\times$ 2 (ethnicity) $\times$ 2 (sex). Subsequent to the multivariate test, follow-up univariate ANOVAs were examined, and for significant interaction terms, simple effects analyses were conducted with Bonferroni adjustment. (The adjustment was for six comparisons for significant two-way interactions and 12 comparisons for significant three-way interactions. This adjustment is a backward Bonferroni correction in which the *p* values we report can be compared directly to an alpha level of .05 to determine significance).

Results

The means and standard deviations for descriptive, adult injunctive, and student injunctive norms are presented in Tables 2 through 4. The multivariate tests are presented in Table 5 and univariate tests are presented in Table 6. *F* ratios for all multivariate analyses are based on Pillai's Trace. Multivariate and univariate results are presented by each set of dependent variables.

Descriptive Norms

Significant multivariate main effects were found for grade, sex, and ethnicity. These main effects were qualified by significant interactions for grade by ethnicity and grade by sex by ethnicity.

Alcohol—The univariate ANOVA for alcohol indicated a significant grade effect, with descriptive norms increasing with higher grades. In addition, descriptive norms were generally higher for female students as compared to their male counterparts. A significant grade by ethnicity interaction indicated that at grade 8, descriptive norms for alcohol were higher among AI students (5.13 v. 4.45, $p = .007$).

Marijuana—Similar to the results for alcohol, the univariate ANOVA results indicated that descriptive norms for marijuana increased with higher grades, and they were generally higher for female students as compared to male students. Differences in descriptive norms across ethnicity were also found, with higher perceived use among AI students compared to White students. However, as indicated by a significant interaction between ethnicity, grade, and sex, these findings varied across levels of sex and grade. Specifically, there was no difference in descriptive norms between male and female students for AI eighth and 10th graders. By grade 12, however, AI male students reported lower levels of descriptive norms than did AI female students (5.81 vs. 7.64, $p < .001$). Among White students at all grade levels, female students reported higher descriptive norms than their male counterparts.

Inhalants—The univariate ANOVA results indicated no significant differences in descriptive norms across grade; however, descriptive norms were generally higher for female compared to male students. A significant three-way interaction was explained by higher descriptive norms among White eighth-grade female students, compared to their AI counterparts (4.59 vs. 3.43, $p < .001$).

Student Injunctive Norms

For student injunctive norms, significant multivariate main effects were obtained for grade and ethnicity, in addition to a significant two-way interaction for grade by ethnicity.

Alcohol—As indicated by the univariate ANOVA, a significant difference across grade was found for alcohol with student injunctive norms generally decreasing from grade 8 to grade 12. When differences across grade by ethnicity were examined from simple effects, it was found that at grade 8, White students reported higher student injunctive norms compared to AI students (3.67 vs. 3.35, $p = .02$). No differences were found at grade 10. But by grade 12, even though the norms had decreased, the pattern was reversed with student injunctive norms for alcohol being higher among AI students compared to White students (3.00 vs. 2.81, $p = .02$).

Marijuana—A main effect for grade indicated that student injunctive norms decreased from grade 8 to grade 12. In addition, the main effect for ethnicity was accounted for by AI

students reporting significantly lower levels of student injunctive norms compared to White students (2.93 vs. 3.21, $p = .001$).

Inhalants—No significant differences in student injunctive norms for inhalants were found for either grade or sex. Similar to the findings for marijuana, with a main effect for ethnicity, AI students reported significantly lower levels of student injunctive norms compared to White students (3.65 vs. 3.82, $p = .024$).

Adult Injunctive Norms

For adult injunctive norms, significant multivariate main effects were found for grade and ethnicity, and a significant two-way interaction was found for grade by sex.

Alcohol—The univariate ANOVA indicated a grade by sex interaction for adult injunctive norms for alcohol. In particular, there were no differences in adult injunctive norms for alcohol between male and female students at grades 8 and 10. But at grade 12, female students reported significantly higher adult injunctive norms compared to male students (4.33 vs. 3.89, $p = .003$).

Marijuana—Similar to alcohol, a significant grade by sex interaction was found, with no significant sex differences at grades 8 and 10, but higher perceived adult injunctive norms among female students at grade 12 (4.32 vs. 3.98, $p = .025$). In addition, a significant main effect for ethnicity was found with White students perceiving higher levels of adult injunctive norms compared to AI students (4.42 vs. 4.02, $p < .001$).

Inhalants—The univariate ANOVA indicated only a significant effect for ethnicity. Similar to adult injunctive norms for marijuana, White students perceived higher levels of adult injunctive norms compared to AI students (4.59 vs. 4.35, $p = .001$).

Discussion

The results indicated that there are both differences and similarities in the normative environment for substance use among White and AI students who attend the same schools on or near a reservation. The commonalities in findings may reflect general features of the normative environment for substance use among adolescents. In contrast, differences across ethnicity are likely to indicate important differences in how AI and White youth view social influences in relation to substance use.

Alcohol Use

Overall, the differences in norms for alcohol use present a mixed picture. The results for descriptive and student injunctive norms show that, as hypothesized, eighth-grade AI students perceive more prevalence of drinking and less disapproval of drinking by other students. But contrary to our hypothesis, these differences disappear at grade 10 and turn around at grade 12. These results may be partly because of the higher level of school dropout by AI youth than White youth (Faircloth & Tippeconnic, 2010; Swaim, Beauvais, Chavez & Oetting, 1997) combined with the strong relationship between substance use and dropping out of high school (Townsend, Flisher, & King, 2007). But no matter the reason for these results, they suggest that AI students are at increased risk for social influence to drink at younger ages when compared to White students who attend the same schools.

Differences in descriptive and adult injunctive norms for alcohol use were also found by gender. Female students, regardless of ethnicity, reported higher levels for descriptive norms than males, possibly increasing their risk for use. This result may be because of differences

in the way male and female adolescents estimate the substance-using behavior of peers. As noted by Borsari and Carey (2003), because females tend to drink in mixed groups with males, their lower use leads to increased salience of male drinking, resulting in overestimation of general rates of drinking among females.

Regarding adult injunctive norms, 12th grade females, as compared to their male counterparts, were more likely to perceive that adults disapproved of student drinking, regardless of ethnicity, and this perception was stronger among AI female 12th graders. This difference between males and females may be partly because of differences in parental communication about alcohol use to sons versus daughters. Though little research exists on this topic as related to substance use, communication research does show a difference for sexual topics, with parents of daughters talking more about sexual topics, being more concerned about potential harmful consequences of sexual activity, and being more disapproving of their child having sex at an early age (Wilson & Koo, 2010). In addition, parents tend to be more protective generally of daughters than sons (Schulte, Ramo, & Brown, 2009), and other research suggests that differences in risk-taking between male and female adolescents may relate to differential norms and expectations by gender (Byrnes, Miller, & Schafer, 1999). On the other hand, these differences in perceptions of adult norms may arise from explicit permission given to boys.

Marijuana Use

Findings for descriptive norms for marijuana use were complex as evidenced by the significant three-way interaction between grade, ethnicity, and gender. As hypothesized, as grade increased, students reported having more classmates who use marijuana. Among White students, females reported having more classmates who use marijuana than did male students at all grade levels. As noted earlier for alcohol, this may be because of female students' tendency to overestimate use among peers because of higher levels of use among males. But among AI students, there were no significant differences between male and female perception of peer use until 12th grade, where male AI students reported having more friends who use marijuana than female AI students. This finding is somewhat surprising given that AI students who remain in school through grade 12 are significantly less likely to use marijuana than their counterparts who leave school early (Swaim et al., 1997).

Consistent with our hypothesis, students perceive their peers as more permissive of marijuana use with age, but with a significant change in perception occurring between grades 8 and 10, and less of an increase to grade 12. This suggests that the time between the eighth and 10th grades is likely to be a critical period of risk for increased marijuana use and may be a key developmental period for monitoring and prevention efforts.

Also as hypothesized, AI youth in general, perceived less disapproval of marijuana use by their classmates and by adults than their White counterparts, putting these AI youth, no matter their grade or sex, at a higher risk of marijuana use than White youth. As occurred with alcohol, female AI students perceived more disapproval of marijuana use by adults compared to male AI students. This again calls into question whether AI adults hold different standards for use among girls versus boys, and it has important implications for parent training in communication with their adolescent children.

Inhalant Use

Whereas there were no differences across ethnicity for descriptive norms for inhalant use among male students, eighth-grade White females reported having more classmates using inhalants than did eighth-grade AI females. These findings do not support our hypothesis

that descriptive norms will be higher for AI students. However, consistent with our hypothesis regarding student and adult injunctive norms as related to ethnicity, AI students, regardless of grade, perceived less disapproval among their classmates and among adults for use of inhalants compared to White students. Historically, AI inhalant use has been higher than White use; however, the trend more recently is for AI and White use to be comparable (Beauvais et al., 2008a). Our results suggest, on the one hand, that younger White female students who attend the same schools as AI students may be at higher risk for inhalant use because of more models for use at a young age. With more encouragement by peers and less discouragement by adults, avoidance of inhalant use among this group of youth is made more difficult.

Limitations

There were several limitations to this study. First, the data were based on self-report. This can raise questions as to the reliability and validity of the data collected. But in the current case, the goal was to obtain data regarding the perceived normative environment for substance use, making self-report the best method of obtaining these data. The perceived environment, as opposed to the actual normative environment, is an important construct in that it is linked to actual behavior (level of substance use) among the perceiver (Borsari & Carey, 2001). Furthermore, it has been demonstrated that perceptions of the normative environment for substance use can be altered (Prince & Carey, 2010), making it a promising target for intervention.

Another limitation lies in the descriptive nature of this study. We examined differences in the normative environment by grade, sex, and ethnicity, but we purposely did not explore precursors to the substance use norms, nor did we examine differences in substance use that result from the observed differences in norms. The intent of this study was to first define the topography of the normative environment for substance use among these two groups of at-risk adolescents. Future research should examine why the estimated differences in norms arise, and, just as importantly, how these differences are related to differences in substance use patterns.

Another limitation regards the nature of the sample. This study was a school-based study. We noted earlier the problem of school dropout among AI youth. With as many as half of AI students leaving school before graduation, school-based studies are likely to underestimate rates of problem behaviors and relationships to other variables. But it remains important to investigate these behaviors and relationships among those youth who remain in school. We acknowledge, however, that the results we report may differ from those obtained from the entire population of AI and White youth who live on or near reservations.

Conclusions

Our findings indicate that there are important differences in the normative environment for substance use between reservation-based AI youth and White youth who reside in the same area and attend the same schools. Generally, risk is higher for AI students. Young AI students report having more peer models for alcohol use compared to White students, and among 12th grade AI students, they perceive that adults are more accepting of alcohol use for males than for females. This perception of differential attitudes for use also occurs for marijuana use among older AI youth and across all grades for inhalants. AI students also see their peers as more accepting of inhalant use than do White students. One exception to the overall increased risk for AI youth is higher risk for younger White female students who report more descriptive norms for inhalant use as compared to younger AI female students. The combined effects of these various normative influences from peers and adults help explain the recurrent higher rate of substance use among AI compared to White youth.

These results also indicate that the increased risk for Indian youth remains present when they are compared to White students who live in the same geographic area and attend the same schools.

A key implication for prevention regards parent-child communication about substance use. While little is known about gender-specific parental communication to children about substance use, multiple studies have shown that parents tend to monitor the behaviors of daughters more than sons (Crouter & Head, 2002; Crouter, Helms-Erikson, Updegraff, & McHale, 1999; Svensson, 2003). Furthermore, it is well established that increased parental monitoring reduces risk for alcohol use (Beck, Boyle, & Boekeloo, 2003) and drug use (Steinberg, Fletcher, & Darling, 1994; Svensson, 2003). We demonstrated in a previous study that perceived parental attitudes toward adolescent drug use differ between AI and White youth (Swaim, Oetting, Jumper-Thurman, Beauvais, & Edwards, 1993). Future studies should be designed to more clearly delineate whether parents begin to alter, not only their expectations, but explicit communications about substance use, resulting in messages to youth that are more permissive for males and more restrictive for females. It is also important to understand how expectations and communications may differ across various types of substances, and to determine the developmental timing at which differential messages are presented to sons and daughters, and how these differences relate to ethnicity.

A further implication regards the structure of prevention interventions and treatment for AI youth. It is widely accepted that among ethnic minority youth, and AI youth in particular, families have more salience than among non-AI youth (Wilson, Phillip, Kohn, & Curry-El, 1995). For White youth, the task of adolescence is individuation and movement away from the family. For Indian youth, family bonds are prized and are maintained throughout life, not only with the nuclear family, but with a wide range of persons in the extended family. Given this pattern, it seems imperative to include family members in both prevention and treatment efforts. This would provide the opportunity for parents and other key adult family members to learn how to effectively communicate their values and norms to their children. The values and norms should pertain not only to drug and alcohol use, but should extend to the strengths of traditional culture that are protective of such use. Such an approach is, of course, useful among all cultural groups, but may be especially important for AI families.

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Table 1

Sample Characteristics by Ethnicity, Grade, and Sex

	Grade					
	8		10		12	
	M	F	M	F	M	F
American Indian (AI)	146	130	69	75	35	42
White	46	39	115	68	76	134
Total	192	169	184	143	111	176

Table 2

Mean Descriptive Norms (SD) by Grade, Sex, Ethnicity, and Substance

		Grade					
		8		10		12	
		M	F	M	F	M	F
Alcohol	AI	4.64 (2.44)	5.61 (2.07)	5.81 (2.27)	6.51 (2.05)	5.27 (2.05)	6.93 (1.79)
	White	3.33 (1.49)	5.57 (1.82)	5.51 (1.87)	6.53 (1.75)	5.98 (1.77)	7.14 (1.65)
Marijuana	AI	5.52 (2.82)	6.05 (2.34)	6.46 (2.60)	6.96 (2.28)	5.81 (2.41)	7.64 (2.04)
	White	3.49 (1.87)	5.71 (2.15)	5.23 (2.13)	6.38 (2.14)	5.52 (2.01)	6.47 (1.73)
Inhalants	AI	2.98 (1.91)	3.43 (1.73)	3.40 (1.83)	3.66 (1.73)	2.61 (0.99)	4.18 (1.68)
	White	2.74 (1.22)	4.59 (1.92)	3.28 (1.42)	3.77 (1.63)	3.03 (1.27)	3.83 (1.49)

Table 3

Mean Adult Injunctive Norms (SD) by Grade, Sex, Ethnicity, and Substance

		Grade					
		8		10		12	
		M	F	M	F	M	F
Alcohol	AI	4.10 (1.32)	4.30 (1.09)	4.10 (1.15)	4.33 (0.93)	3.79 (1.17)	4.26 (0.94)
	White	4.64 (0.60)	4.10 (1.12)	4.28 (0.88)	4.26 (0.85)	3.98 (0.96)	4.40 (0.72)
Marijuana	AI	3.98 (1.32)	4.20 (1.17)	3.92 (1.27)	4.22 (1.03)	3.70 (1.31)	4.09 (1.10)
	White	4.73 (0.53)	4.13 (1.17)	4.42 (0.86)	4.41 (0.79)	4.25 (1.00)	4.55 (0.68)
Inhalants	AI	4.21 (1.33)	4.43 (1.11)	4.22 (1.27)	4.51 (0.87)	4.28 (1.17)	4.44 (0.96)
	White	4.77 (0.55)	4.23 (1.25)	4.57 (0.75)	4.55 (0.72)	4.67 (0.74)	4.74 (0.61)

Table 4

Mean Student Injunctive Norms (SD) by Grade, Sex, Ethnicity, and Substance

		Grade					
		8		10		12	
		M	F	M	F	M	F
Alcohol	AI	3.30 (1.36)	3.40 (1.30)	3.05 (1.02)	3.02 (1.08)	3.79 (1.17)	3.04 (0.97)
	White	3.77 (1.21)	3.56 (1.14)	3.04 (1.04)	2.70 (0.95)	2.62 (1.04)	2.31 (0.84)
Marijuana	AI	3.19 (1.39)	3.09 (1.34)	2.87 (1.19)	2.89 (1.12)	2.92 (1.11)	2.61 (1.04)
	White	3.84 (1.28)	3.49 (1.32)	3.23 (1.07)	3.01 (1.03)	2.93 (1.09)	2.77 (0.99)
Inhalants	AI	3.57 (1.50)	3.80 (1.25)	3.41 (1.37)	3.74 (1.17)	3.74 (1.08)	3.59 (1.06)
	White	4.10 (1.18)	3.85 (1.27)	3.73 (1.17)	3.60 (1.02)	4.00 (1.08)	3.79 (0.89)

Table 5

Multivariate Effects by Type of Norm and Source of Variance

	<i>df</i>	<i>Value</i>	<i>F</i>	<i>Sig.</i>
Descriptive Norms				
Grade	6,1772	.108	16.823	***
Sex	3,885	.093	30.083	***
Ethnicity	3,885	.072	22.742	***
Grade $\times$ Sex	6,1772	.014	2.024	NS
Grade $\times$ Ethnicity	6,1772	.026	3.904	***
Sex $\times$ Ethnicity	3,885	.003	0.821	NS
Grade $\times$ Sex $\times$ Ethnicity	6,1772	.017	2.573	*
Student Injunctive Norms				
Grade	6,1772	.089	13.675	**
Sex	3,885	.007	2.116	NS
Ethnicity	3,885	.048	15.166	***
Grade $\times$ Sex	6,1772	.008	1.177	NS
Grade $\times$ Ethnicity	6,1772	.017	2.562	*
Sex $\times$ Ethnicity	3,885	.004	1.267	NS
Grade $\times$ Sex $\times$ Ethnicity	6,1772	.002	0.247	NS
Adult Injunctive Norms				
Grade	6,1772	.020	3.034	**
Sex	3,885	.005	1.412	NS
Ethnicity	3,885	.048	14.982	***
Grade $\times$ Sex	6,1772	.017	2.457	*
Grade $\times$ Ethnicity	6,1772	.004	0.643	NS
Sex $\times$ Ethnicity	3,885	.009	2.593	NS
Grade $\times$ Sex $\times$ Ethnicity	6,1772	.005	0.699	NS

Note.*
<.05.**
<.01.***
<.001.

Table 6

Univariate Effects by Type of Norm and Source of Variance

	<i>df</i>	<i>F</i>	<i>Sig.</i>
Descriptive Norms			
Grade			
Alcohol	2,887	41.876	***
Marijuana	2,887	19.769	***
Sex			
Alcohol	1,887	76.164	***
Marijuana	1,887	49.534	***
Inhalants	1,887	56.079	***
Ethnicity			
Marijuana	1,887	30.809	***
Grade × Ethnicity			
Alcohol	2,887	4.452	*
Grade × Sex × Ethnicity			
Marijuana	2,887	4.379	*
Inhalants	2,887	6.140	**
Student Injunctive Norms			
Grade			
Alcohol	2,887	34.117	***
Marijuana	2,887	14.888	***
Ethnicity			
Marijuana	1,887	10.264	***
Inhalants	1,887	5.137	*
Grade × Ethnicity			
Alcohol	2,887	5.993	**
Adult Injunctive Norms			
Ethnicity			
Marijuana	1,887	25.440	***
Inhalants	1,887	10.642	***
Grade × Sex			
Alcohol	2,887	4.894	**
Marijuana	2,887	3.638	*

Note.*
<.05.**
<.01.***
<.001.