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Among American Secondary Schools

and Their Association With Student Alcohol and Marijuana Use

Revathy Kumar
Patrick M. O'Malley
Lloyd D. Johnston

THE UNIVERSITY OF MICHIGAN · ARTES SCIENTIA VERITAS · 1817

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ABSTRACT

This paper examines school policies relating to alcohol and illicit drug use, and their associations with the prevalence of alcohol and marijuana use among students. Both "punitive" and "supportive" policies are examined. Other studies examining punitive disciplinary measures—such as close monitoring of student behavior, having various security measures, and expulsion or suspension from school—as a means of ensuring student compliance to school policies have suggested that these measures do little to reduce drug and alcohol use among students. Supportive measures, however, such as the availability of services and the presence of caregivers, may reduce the prevalence of substance use among students.

Analyses use data from nationally representative samples of 8th-grade students (29,822 in 246 schools), 10th-grade students (22,964 in 212 schools), and 12th-grade students (23,594 in 226 schools) who participated in annual surveys conducted by the Monitoring the Future project from 1998 to 2001. Analyses also use data from surveys of principals of the same schools collected under the Youth, Education, and Society study, sponsored by the Robert Wood Johnson Foundation. For each of the three grades, descriptive statistics on the level of monitoring, number of security measures, severity of punitive actions taken for violation of school policies, and number of care providers and services are presented for schools with different demographic characteristics.

Using multilevel logistic regression, we found that monitoring, number of security measures, and severity of consequences for violation of school policies showed little systematic association with actual substance use in general or substance use at school. Additionally, contrary to our hypothesis, schools that adopted a variety of supportive measures, such as providing more services and care providers, did not, in general, have lower average substance use than schools providing fewer such services. The implications of these findings for school policies and practices are discussed.

ACKNOWLEDGMENTS

INTRODUCTION

American adolescents' use of illicit drugs has been recognized as a significant problem since the 1960s, and their excessive use of alcohol has been recognized even longer. Because of the magnitude of these problems, numerous initiatives have been undertaken in the form of research, prevention, and intervention to curtail adolescents' substance use. Federal, state, and local governments have backed these efforts. In 1987, the federal government held a series of regional conferences and issued a final report of the White House Conference for a Drug-Free America (1988, pp. 162-163) that states:

> Schools (from kindergarten through high school) and local boards of education must establish and enforce policies and procedures for students, teachers, administrators, and staff that clearly forbid the sale, distribution, possession, or use of all illicit drugs and alcohol on school property or at school-sponsored functions. Parents, students, and community officials should participate in developing and supporting these policies.

The Goals 2000: Educate America Act, passed in 1994, included a separate national educational goal to establish safe and drug-free schools. The aim was that by the year 2000, every school in the United States would be free of drugs, alcohol, and violence and would offer a disciplined environment conducive to learning. In compliance with the laws passed by the government, most schools districts developed and implemented policies designed to control the use of alcohol and other drugs in school settings. By the mid-1990s, 97% of school districts across the nation had policies that prohibited alcohol and drug use among students, and 64% defined a drug-free school zone around school grounds (Ross et al., 1995).

In spite of schools' implementation of various policies and practices to curb alcohol and drug use, the problem persists. As trend data from Monitoring the Future study indicate, alcohol use among students remained fairly stable at rather high levels through the late 1990s and into the 2000s, with approximately 29% of 12th graders, 22% of 10th graders, and 12% of 8th graders in 2002 reporting that they engaged in heavy drinking within the past two weeks. Marijuana use was considerably higher in 2002 than in 1991, with approximately 36% of 12th graders, 30% of 10th graders, and 15% of 8th graders reporting that they had used marijuana in the past 30 days (Johnston, O'Malley, & Bachman, 2003). Thus, there remains a need to examine the measures schools have taken to implement drug-free policies and to consider whether the association between these measures and student behaviors offers any evidence that they have had their intended effects.

There is a general consensus among school administrators and researchers that schools need comprehensive school policies that reflect the norms and expectations of the school, are clearly articulated, and are implemented fairly and consistently (Ross et al., 1995; Goodstadt, 1989). The issue is not whether there should be school policies prohibiting substance use in school, but rather which policies to have and *how* to implement them.

One central issue regarding policies is the extent to which policies should be punitive as opposed to supportive. While most schools do have disciplinary measures to control students' substance use behavior, some schools also adopt a more supportive stance to help students overcome these problems. In the following section we examine some of the common measures, punitive and supportive, that schools take to prevent alcohol and drug use among students and the effect these measures appear to have on the prevalence of alcohol and marijuana use among students.

Monitoring Student Behavior

Reports from the national survey of the School Health Policies and Programs Study (SHPPS; Ross et al., 1995; Small et al., 2001) indicate that many schools actively monitor students' behavior. A comparison of the 1995 and 2001 reports suggests that the kind and number of security measures used for monitoring student behavior have remained fairly constant over the past decade. According to these reports, about two-thirds of all school districts define a drug-free school zone around school grounds. Almost all school districts in the SHPP study report that use of alcohol, tobacco, and other drugs is prohibited in school buildings and on school grounds during both regular school hours and nonschool hours. To ensure that the schools remain drug-free, most school administrators monitor their students' behavior in one way or another.

Among their findings: approximately 75% to 85% of middle schools and high schools monitor the hallways and school grounds. Compared to middle schools, more high schools have police officers and security guards patrolling their grounds. Nineteen percent of middle schools and 30% of high schools report having a uniformed police officer on school grounds. Eleven percent of middle schools and 23% of high schools have security guards patrolling their school. Ten percent of middle schools and high schools use metal detectors and over 20% of both middle and high schools have surveillance cameras (Small et al., 2001). Thus, while monitoring students' behavior is a common practice in most schools, the question remains as to how effective these monitoring and security measures are in controlling students' alcohol and drug use behavior.

Few studies have examined the effects of security measures and of monitoring by school personnel on the actual use of alcohol and drugs by students. However, based on research regarding the effect of parental monitoring on adolescents' alcohol and drug use, which suggests that poorly monitored adolescents are more likely to use drugs than well-monitored adolescents (Chilcoat, Dishon, & Anthony, 1995; Chilcoat & Anthony, 1996; Steinberg, Fletcher, & Darling, 1994), it seems likely that prevalence of alcohol and marijuana use would be lower in schools where students are monitored closely by school personnel. Further, security measures such as surveillance cameras and restroom smoke detectors would likely act as deterrents. The prevalence of alcohol and marijuana use in schools with more security measures is therefore likely to be lower because of students' fear of being caught.

Punitive Measures: Disciplinary Consequences for Violating the School Policy

Earlier research has shown that most schools use punitive disciplinary measures, such as detention, suspension, and expulsion, when students are caught using alcohol or drugs in school

(Brown & D'Emidio-Caston, 1995; Schwartz, 1984). However, the effectiveness of such disciplinary measures in curtailing marijuana and alcohol has been questioned (Moskowitz, 1989). A majority of the students interviewed by Brown and D'Emidio-Caston (1995) believed that punitive policies like expulsion and suspension do not support those students who really need help, thus further alienating students who are already on the margins of the school system. Some researchers argue that adolescents often become more "at risk" when punitive disciplinary policies are rigorously implemented (Cohen & Brook, 1995; Karp & Breslin, 2001; Schwartz, 1984). Application of sanctions has been found to further alienate students from school, increasing the likelihood of dropping out of school and engaging in delinquent behavior (Schwartz, 1984). Some of the studies that have examined punitive disciplinary measures as a means of ensuring student compliance to school policies suggest that these measures do little to reduce drug and alcohol use among students (e.g., Munro & Midford, 2001). Other studies even suggest that punishment is actually associated with higher level of alcohol and marijuana use by students (Paternoster & Piqura, 1995). The argument put forward in both these studies is that instead of having the desired effect of deterrence and reduction in use, punishment produces defiance, which leads to increased substance use among students.

We consider it quite possible that punitive disciplinary action is relatively ineffective in reducing the prevalence of alcohol and marijuana use among students. As Karp and Breslin (2001) point out, suspension and dismissal run counter to the mission of the educational system. Resorting primarily to punishment as a means of solving the drug dilemma is likely to be ineffective in the long run. It is also possible that schools where the drug and alcohol prevalence rates are high resort to punitive disciplinary measures like suspension and expulsion in an attempt to lower their students' higher rates of alcohol and drug use. If so, alcohol and drug use may be correlated with punitive actions by school personnel simply because the former leads to the latter.

Supportive Approaches to Prevention and Intervention

Many prevention researchers view punitive school policies as a means to "get rid of bad kids," but this view results in excluding the very students who are most in need of help (Brown & D'Emidio-Caston, 1995). Kumpfer and colleagues (1985) and Moskowitz (1989) state that not only is the effectiveness of these policies in preventing substance use questionable, but such policies may promote a very maladaptive view of adolescents. They argue instead for a more developmentally appropriate set of prevention services, providing help for those who really need it. One means by which schools can help students who are at risk for abusing substances is to provide services delivered by qualified care providers, including counselors, social workers, and nurses. These professional care providers are in a unique position to provide prevention, identification, and intervention services because of their daily access to children and adolescents. In a critical review of literature on programs and other interventions designed to prevent substance abuse among youth, Paglia and Room (1999) reported that students enrolled in schools with care providers and other services indicated a decrease in heavy drinking.

Actively involving students to change their behavior and reintegrating them in school rather then separating and punishing them may be more effective in preventing substance use. In their in-depth study of "restorative" practices adopted by three schools for preventing substance use, Karp and Breslin (2001) found that providing the services of a drug health coordinator who

engaged students in conferences and dialogue regarding the harm involved in using drugs, along with requiring students to take personal responsibility for changing their behavior, was effective in reducing the number of suspensions and expulsions because of substance use. Based on prior research, we believe that schools that provide more support for students in the form of (1) care providers, including drug abuse counselors, social workers, nurses, and psychologists, and (2) services such as peer counseling, substance abuse counseling, and dropout prevention, are likely to have a lower prevalence rate of alcohol and marijuana use.

Cross-sectional data on alcohol and marijuana use across the years from the Monitoring the Future (MTF) study indicate that the prevalence of these substances increases as students move from 8th grade (middle school) through 10th and 12th grades (high school) (Johnston et al., 2003). Reports from the nationwide School Health Policies and Programs Study (SHPPS) indicate that this increase in use is accompanied by an overall increase in the presence of security measures in high schools compared to middle schools. If caught using alcohol or drugs, both middle school and high school students were equally likely to face swift retributions and punishments. Small et al. (2001) report that an equally high percentage of middle and high schools responded to infraction of school policies with punishment in the form of in-school suspension, suspension from school, expulsion from school, and expulsion from extracurricular activities. Because there is little research examining the association between measures, either punitive or supportive, that schools take and substance use by students of different ages, we propose in this study to examine the relation between the prevalence of alcohol and marijuana use among 8th-, 10th-, and 12th-grade students and (a) the services and support provided in the school, (b) the number of security measures adopted, (c) the extent of monitoring, and (d) the severity of consequences for infractions of school policies.

To summarize, we hypothesize that:

1. Schools that monitor their students closely and have greater number of security measures in place will deter students from using alcohol or marijuana and, therefore, the prevalence rate for these substances will be lower in these schools.

2. Punitive actions taken for infraction of the school alcohol and drug use policy will do little to decrease the prevalence of these substances among students.

3. Schools with a high prevalence rate of alcohol and marijuana will be more likely to adopt severe consequences for students caught using these substances in an attempt to deter students from engaging in such behavior.

4. Supportive measures taken by schools will be beneficial for students, and schools with more supportive measures in place will have a lower prevalence of alcohol and marijuana.

METHOD

Sample and Survey Procedures

This study utilizes data from the Monitoring the Future project (Johnston et al., 2003), which surveys nationally representative samples of 12th-, 10th-, and 8th-grade students in public and private schools each year, beginning in 1975 for the 12th-grade students and in 1991 for the 8th- and 10th-grade students. Data are collected following standardized procedures using self-administered questionnaires administered in classrooms by locally based University of Michigan representatives and their assistants.

Each school is asked to participate in the project for two years. Beginning in 1998, under a grant from the Robert Wood Johnson Foundation, we asked administrators of schools that had just completed their second year of participation in the study to complete a questionnaire on the school's policies and programs regarding substance use. The majority of the respondents are school principals, but in some cases assistant principals, teachers, and counselors participated. The present analyses use data from students and school administrators in schools participating in their second year from 1998 to 2001. The combined samples include 29,822 8th-grade students from 246 schools, 22,964 10th-grade students from 212 schools, and 23,594 12th-grade students from 226 schools.

The surveys for the 12th graders use six different questionnaire forms distributed to participants in an ordered sequence that ensures six virtually identical random subsamples. All six forms include all the demographic variables and alcohol and marijuana use questions. The surveys for the 8th and 10th grades use four different questionnaire forms, with no difference between the two grades. Much of the questionnaire content is drawn from the 12th-grade questionnaire, and all four forms include demographic variables and measures of alcohol and marijuana use.

Measures

Dependent variables. This study involved two sets of dependent variables. The first set included two variables—heavy use of alcohol in the past two weeks and marijuana use in the past 30 days—that are included in all forms and therefore asked of all respondents. Heavy alcohol use is defined as having five or more drinks in a row on at least one occasion in the past two weeks. For analyses, the measures of heavy alcohol use and marijuana use were both dichotomized; a value of 1 indicates, for alcohol, one or more episodes of heavy drinking in the past two weeks and, for marijuana, use on at least one occasion in the past 30 days. All others received a value of zero.

The other two dependent variables are measures of students' use of substances at school. Twelfth-grade students who reported any use of alcohol or marijuana in the past year were asked how often they used alcohol or marijuana at school in the past year. The 8th- and 10th-grade students were asked how often they used (a) alcohol or (b) marijuana or any other drugs (e.g., cocaine, amphetamines, etc.) at school in the past year.

Of the six forms of the surveys administered to the 12th-grade students, only one form includes questions pertaining to substance use at school; and for the 8th- and 10th-grade students only one of the four forms (that particular form was given to one-third of the students) includes questions pertaining to substance use at school. The variables were recoded as dichotomous variables with 0 = "never," and 1 = "one or more times."

Predictor variables. The predictor variables of concern, assessed by a school policies and programs questionnaire completed by school administrators, include scales measuring (a) total number of security measures in school, (b) extent of monitoring students' compliance to schools' alcohol and drug use policy, (c) severity of consequences when students are caught violating the policy, (d) total number of care providers available for students, and (e) total number of services provided for students. The appendix includes a list of the items included in each scale. School administrators' reports of the various security measures enforced in schools were summed to obtain a count of the total number of security measures. These comprise (a) closed campus; (b) police officers in the school; (c) security guards; (d) student ID checks; (e) patrolling of outside areas by school staff, guards, or police officers; (f) faculty or staff monitoring of student restrooms; (g) smoke detectors in restrooms; (h) hall monitors; and (i) observational cameras.

Each scale that measures the extent of monitoring compliance with the school's (a) alcohol policy and (b) drug use policy is the mean of seven items—five measuring students' compliance in school and on school grounds, and two measuring compliance at school-sponsored events. All the items are on a five-point scale ranging from 1 = "not at all" to 5 = "very strictly." The Cronbach alphas for the two seven-item scales measuring the extent to which there is monitoring of student compliance with the school's alcohol policy and drug use policy were .90 and .92, respectively.

Two severity scales, one measuring the severity of action taken for violation of alcohol use policies and the second measuring the severity of action taken for violation of drug use policies, were created from two sets of 39 dichotomous variables. These dichotomous variables represented 13 different actions that schools could take when students are caught violating the policy for the first, second, and third (or subsequent) times: warning given to student, parents or guardians notified, school administrators/counselor notified, student required to meet with the school counselor, parents and guardians required to meet with school officials, student referred to an assistance program, student required to participate in education or counseling program, student suspended from extracurricular activities, student given detention or in-school suspension, student suspended from school, law enforcement officials notified, student sent to alternative school/program, and student expelled from school altogether. Exploratory factor analysis of these 13 actions, conducted separately for each of the three stages of infraction, resulted in seven basic factors. These seven categories were ranked on a seven-point scale of severity by 25 judges. Their rankings, starting with the least severe response, were (1) warning/detention, (2) notification/meeting with parents and counselors, (3) counseling/education, (4) suspension, (5) law enforcement notification, (6) alternative program, and (7) expulsion. Table 1 presents the percentage of schools that take various actions when their alcohol and drug use policy is violated the first time. The first column in Table 1 is the severity scale ranging from "1 = least severe" to "7 = most severe." Actions that fall within each of these seven categories are presented in the second column of this table.

Each school was given the score for the highest category for which it qualified. Thus for each substance (alcohol and illicit drugs), each school received three scores, ranging from 1 to 7, that measured its response to three levels of violation—first time, second time, and third time. The final severity scale was the mean across the three. These predictors are indicative of the level of punitive action taken by schools to prevent alcohol and, separately, drug use.

School administrators' reports of the full-time equivalent (FTE) availability of any of the six different care providers—guidance counselor, drug abuse counselor, student assistant counselor, health nurse, social worker, and psychologist—were summed to provide an aggregate count of the total FTE health care providers available to students in their school. A similar count of the total number of services routinely offered to students was obtained by summing the various services available to students. The list of services comprises dropout prevention, counseling for substance abusers, counseling to students whose parents are substance abusers, counseling for other family problems, pregnancy prevention, sex education, peer counseling/support, suicide prevention, grief and loss counseling, and primary health care clinic. These two measures are taken as indicative of the extent of support provided to students.

The following predictor variables are available from the 12th-grade sample only. One of the six forms of the student survey includes measures of students' perception of (a) the vigor with which teachers and administrators attempted to prevent alcohol use and drug use in their school, and (b) the severity of consequences if students were caught using alcohol or drugs. These measures were aggregated (that is, averaged) within each school to reflect the overall perception of the student body.

Control variables. At the student level, the control variables comprised students' personal demographic characteristics—gender, race/ethnicity, and student-reported level of parental education. At the school level, the control variables comprised type of school (public or private), school size (in terms of the number of students in the relevant grade—8th, 10th, or 12th), urbanicity, and year of participation in the study. The urbanicity measure was obtained by aggregating a five-category student-level measure (ranging from farm to large urban area) to the school level. In addition, an indicator of school average socioeconomic status—average parental education—was obtained by aggregating parent education (based on the average of mother's and father's education level) from the student data to the school level.

Analysis Plan

Preliminary descriptive analyses of the student-level and school-level variables were conducted. These included a comparative analysis between the 8th-, 10th-, and 12th-grade samples of school in their level of monitoring of alcohol and drug use in schools, the severity of action taken for violation of alcohol and drug use policy, and the total number of care providers and services available for students.

We conducted hierarchical analyses using HLM5 (Raudenbush, Bryk, Cheong, & Congdon, 2000). Separate sets of analyses were conducted to examine the relation of schools' punitive and supportive practices to students' heavy use of alcohol, use of marijuana in the past 30 days, in-school use of alcohol, and in-school use of marijuana or other illicit drugs. These

analyses were conducted using logistic hierarchical regression for dichotomous outcome variables with values of 0 and 1. Analyses were conducted separately for the 8th, 10th, and 12th grades. The logistic regressions conducted with the 12th-grade sample included student perceptions of the vigor with which teachers and administrators attempted to prevent alcohol and drug use and student perceptions of the severity of consequences if caught violating school policies, aggregated to the school level, as predictors in addition to the other school-level variables.

Each of these hierarchical analyses included three nested models: (1) an unconditional model, (2) a model with only the school policies as predictors of use, and (3) an extension of the second model with the student-level and school-level control variables also included as predictors of use. The general equation representing the final model predicting the log-odds of substance use is presented below.

<u>Level 1 model</u>

η_{ij} (log odds of use) = β_{0j} + β_{1j} (parental education) + β_{2j} (Black) + β_{3j} (Hispanic) + β_{4j} (other race/ethnicity) + β_{5j} (female) + r_{ij} (unexplained variance, level 1)

<u>Level 2 model</u>

β_{0j} = γ_{00} (intercept) + γ_{01} (# of security measures) + γ_{02} (level of monitoring) + γ_{03} (severity of action taken) + γ_{04} (# of care providers) + γ_{05} (# of services) + γ_{06} (teachers prevent drug use, aggregated from student data)[1] + γ_{07} (severity of consequences, aggregated from student data)[1] + γ_{08} (year 1998) + γ_{09} (year 1999) + γ_{10} (year 2000) + γ_{11} (parental education, aggregated) + γ_{12} (school size) + γ_{13} (urbanicity) + γ_{14} (type of school; public/private) + U_{0j} (unexplained variance, level 2)

Combining the level 1 and level 2 equations we have,

η_{ij} (log odds of drug use) = γ_{00} (intercept) + γ_{01} (# of security measures) + γ_{02} (level of monitoring) + γ_{03} (severity of action taken) + γ_{04} (# of care providers) + γ_{05} (# of services) + γ_{06} (teachers prevent drug use, aggregated from student data)[1] + γ_{07} (severity of consequences, aggregated from student data)[1] + γ_{08} (year 1998) + γ_{09} (year 1999) + γ_{10} (year 2000) + γ_{11} (parental education, aggregated) + γ_{12} (school size) + γ_{13} (urbanicity) + γ_{14} (type of school: public/private) + β_{1j} (parental education) + β_{2j} (Black) + β_{3j} (Hispanic) + β_{4j} (other race/ethnicity) + β_{5j} (female) + r_{ij} (unexplained variance, level 1) + U_{0j} (unexplained variance, level 2)

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[1] This predictor was included only for the 12th-grade sample.

RESULTS

Descriptive Statistics

Table 2 presents the prevalence of marijuana use in the past 30 days; heavy drinking in the past 2 weeks; in-school use of marijuana among 12th-grade students; in-school use of marijuana or other drugs among 8th- and 10th-grade students; and in-school use of alcohol among the 8th-, 10th-, and 12th-grade students. It is seen that the prevalence rates of marijuana use in the past 30 days and heavy drinking are greater for students in the higher grades as compared to the lower grades. In this study, only a sixth of the 12th-grade sample of students was asked to report whether or not they used marijuana and alcohol at school in the past year, and a third of the 8th- and 10th-grade sample of students was asked to report whether or not they used marijuana or other drugs and alcohol at school in the past year. Students in 8th grade are less likely to report having used substances when in school than are students in the 10th and 12th grades (Table 2).

The unweighted means and standard deviations for the school-level predictor variables from the school administrator survey are presented in Table 3. The results presented in Table 3 include all the schools within each grade that participated from 1998 to 2001. Results reveal that in almost all schools, across the three grade levels, administrators reported that they monitor students' alcohol use and drug use behavior both in school and at school activities and events strictly or very strictly, with means over 4.0 on this 5-point scale.

On average, school administrators reported that they have 4 to 4.5 different security measures set up in their school (Table 3). In terms of specific measures, over 90% of school administrators of the 8th-grade student sample and approximately 75% of school administrators of the 10th- and 12th-grade samples reported that their school has a closed campus policy. Across the three grades, approximately 48% of the schools reported the presence of a police officer or security guard in the school campus. About 80% of school administrators, across the three grades, reported that they have restroom monitors. A smaller percentage (ranging from 47% for the 8th-grade sample to 60% for the 12th-grade sample) reported that they have hall monitors. ID checks and observation cameras are more prevalent (approximately 30% and 25%, respectively) in schools housing 10th graders and seniors than schools with 8th-grade students (approximately 16% and 19%, respectively).

School administrators of the 8th-, 10th-, and 12th-grade samples of schools reported that on average their schools provide students with a total of about three FTEs of the following caregivers: guidance counselor, drug abuse counselor, student assistant counselor, nurse, social worker, and psychologist. In terms of specific providers, almost all (98.7% and 99.1%) of the school administrators of the 10th- and 12th-grade student samples reported providing their students with guidance counselors. Eighty-eight percent of the school administrators for the 8th-grade sample of students reported the availability of guidance counselors for their students. Across the three grades, approximately 80% of the schools reported the presence of a nurse in school, and over 55% reported that they have a school psychologist. About a third of the schools serving the 10th- and 12th-grade sample of students reported that they have a drug abuse counselor in school, compared with 19% of the 8th-grade sample. However, there is variability among schools in the number of care providers available for students (Table 3). Across all three

grades, larger schools, defined in terms of senior class size, reported the presence of significantly more care providers ($F_{df\ (6,239)}$ = 12.80, p < .001 [8th grade], $F_{df\ (6,205)}$ = 16.83, p < .001 [10th grade], and $F_{df\ (6,219)}$ = 33.22, p < .001 [12th grade]). For the 8th-grade sample of schools, administrators of public schools on average reported significantly more care providers than did administrators of private schools (t $_{(df\ =\ 244)}$ = 14.06, p < .001). However, for the 10th- and 12th-grade sample of schools, differences in the average number of caregivers reported by administrators of public and private schools are not significantly different.

Administrators indicated that, on average, they provide their students about five or six out of a possible seven different kinds of *services:* substance abuse counseling, dropout prevention, counseling for family problems, pregnancy prevention, sex education, peer counseling, and teaching of social and interpersonal skills (Table 3). Fifty percent of administrators of the 10th- and 12th-grade samples of schools and 35% of administrators of the 8th-grade sample of schools reported that they provide counseling for students abusing substances like drugs and alcohol.

Most schools take quite severe measures, ranging from suspension to expulsion, when students are caught violating their school alcohol or drug use policies (Table 1). Almost all school administrators, across the three grades, reported that when students violate the school's alcohol or drug use policies, parents and administrators are notified, and students are suspended from school and from extracurricular activities (Table 1). School administrators, across the three grades, reported that consequences for violating the drug use policy are on average stricter than the consequences for violating the alcohol use policy. A higher percentage of school administrators reported that law enforcement officials are likely to be notified if students are caught using drugs than if they are caught using alcohol (t $_{(df\ =\ 681)}$ = 14.06, p < .001). Across the three grades, a higher percentage of schools require students to participate in referral (t $_{(df\ =\ 681)}$ = 5.89, p < .000) and education programs (t $_{(df\ =\ 681)}$ = 5.37, p < .001) for violation of the drug use policy than for violation of the alcohol use policy (Table 3). School administrators reported that they are also more likely to expel students caught using drugs as compared to students caught consuming alcohol (t $_{(df\ =\ 681)}$ = 5.37, p < .001).

Results of the Multilevel Logistic Regression Analysis

We used logistic regressions for hierarchical analysis to examine the association between punitive and supportive school alcohol and drug use policies and practices on students' heavy drinking, marijuana use in the past 30 days, use of alcohol in school during the past year, use of marijuana in school during the past year (12th grade), and use of marijuana or other drugs (8th and 10th grades), controlling for student and school demographic characteristics. The hierarchical models assume that there is no curvilinear relationship between the policies and drug-using behaviors. Therefore, we tested each of the relationships with curvilinear regressions in order to be sure that there were no significant curvilinear relationships that might be missed with the logistic regression models. We observed no significant curvilinear relationships.

Table 4 presents the final between-school models with school policies and practices predicting the log-odds of heavy drinking and marijuana use, controlling for student and school demographic characteristics. Table 5 presents the effect of school policies and practices on 12th-grade students' in-school use of alcohol and marijuana and 8th- and 10th-grade students' in-

school use of alcohol and marijuana or other drugs, again controlling for student and school demographic characteristics.

A review of results of the multilevel analyses presented in Tables 4 and 5 suggests that although some associations are statistically significant, overall neither these punitive nor these supportive measures seem to have a broadly consistent influence on substance use. The total number of security measures was significantly positively predictive of heavy drinking among 8th-grade students ($\gamma_{\text{(number of security measures)}}$ = .042, p < .05) and significantly negatively predictive of heavy drinking among 12th-grade students ($\gamma_{\text{(number of security measures)}}$ = -.041, p < .05). The predicted percentage of 8th-grade students drinking heavily was 1.8 percentage points higher in schools one standard deviation above the mean (six or more security measures) as compared to schools one standard deviation below the mean (two or fewer than two security measures). On the other hand, the predicted percentage of 12th-grade students drinking heavily in the past two weeks was 3.7 percentage points lower in schools one standard deviation above the mean (six or more security measures) as compared to schools one standard deviation below the mean (two or three security measures). Increased number of security measures was also associated with higher in-school marijuana and other illicit drug use among 10th-grade students ($\gamma_{\text{(number of security measures)}}$ = .091, p < .05). The predicted percentage of 10th-grade students using marijuana or other illicit drugs at school was 3.5 percentage points higher in schools one standard deviation above the mean (six or more security measures) as compared to schools one standard deviation below the mean (two or fewer than two security measures).

The total number of security measures in school was not predictive of heavy drinking among 10th-grade students, in-school drinking and marijuana use in the past 30 days among 8th-, 10th-, and 12th-grade students, in-school marijuana use among 12th-grade students, and in-school use of marijuana and other drugs by 8th-grade students.

Level of monitoring was not significantly associated with any of the four measures of substance use for 8th- and 12th-grade students. For the 8th- and 12th-grade sample of students, level of monitoring of student behavior was not predictive of heavy drinking or marijuana use in general, nor was it predictive of in-school alcohol use and in-school marijuana (marijuana or other drugs for 8th grade) use. Analyses results were similar for the 10th-grade sample, except in the case of in-school alcohol use. Among 10th-grade students, monitoring was significantly associated with lower levels of in-school alcohol use ($\gamma_{\text{(monitoring)}}$ = -.139, p < .05). The predicted percentage of 10th-grade students using alcohol in school was 2 percentage points lower in schools one standard deviation above the mean (very strict monitoring) as compared to schools one standard deviation below the mean (moderate levels of monitoring).

No systematic pattern of relationship emerged between severity of action taken for violation of school policies as reported by the school administrators and students' use of alcohol and marijuana. The relationship between severity of action taken and indices of alcohol and marijuana use were not significant except for 8th-grade students' in-school drinking and 12th-grade students' in-school marijuana use. For the 8th-grade students, severity of action taken for violating school alcohol use policy is negatively associated with in-school alcohol use ($\gamma_{\text{(severity)}}$ = -.17, p < .01). The predicted percentage of 8th-grade students using alcohol in school was 1 percentage point lower in schools one standard deviation above the mean as compared to schools

one standard deviation below the mean in severity of action taken for violation of school alcohol policy.

For the 12th-grade students, severity of action taken for violation of school marijuana use policy was significantly negatively associated with in-school marijuana use ($\gamma_{\text{(severity)}}$ = -.24, p < .01). There was a 3 percentage point lower probability of 12th-grade students' in-school use of marijuana in schools that were one standard deviation above the mean when compared to schools one standard deviation below the mean on the severity of action scale.

For the 12th-grade students, predictors of alcohol and marijuana use also included students' perceptions of severity of consequences if they are caught violating school policies, aggregated to the school level, and their perception of the vigor with which their teachers prevent alcohol and drug use among students, again aggregated to the school level. Neither of these predictors was significantly associated with any of the indicators of alcohol and marijuana use. Overall, these results suggest that across grade levels punitive measures do very little to decrease the probability of alcohol and marijuana use among students.

For this sample of schools and students, results presented in Tables 4 and 5 suggest that, with the exception of in-school drinking among 8th-grade students where the total number of caregivers was significantly positively associated with using alcohol in school ($\gamma_{\text{(# FTE caregivers)}}$ = .08, p < .05), the total number of caregivers[3] in school and the number of services provided for students were not related to students' alcohol or marijuana use. There was a 1% higher probability of 8th-grade students' in-school use of alcohol in schools with approximately 5 full-time equivalent caregivers as compared with schools with only 1.1 or fewer full-time equivalent caregivers. Overall, these results suggest that supportive measures are neither consistent nor significant predictors of lowered use of alcohol and marijuana.

DISCUSSION AND POLICY IMPLICATIONS

In line with other national surveys (Small et al., 2001), we found that, in general, schools monitor their students quite closely, utilize numerous security measures, and have relatively severe policies regarding substance use. Schools monitor students in various ways within the school building and on school grounds, in addition to monitoring school and social events. Findings from this study indicate that schools routinely install, on average, at least four security measures in the school. Schools' policies for handling infractions typically rate high on a severity scale, indicating that their policies are relatively severe. Thus, in line with earlier findings (Brown & D'Emidio-Caston, 1995; D'Emidio-Caston & Brown, 1998; Schwartz, 1984), we found that most schools have adopted measures that might be considered punitive, such as detention, suspension, notification of law enforcement officials, and expulsion, to deal with students who violate the school's alcohol and drug use policy.

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[3] The logistic regression analyses were replicated by substituting the total number of FTE caregivers in the equation with FTE caregivers divided by the number of students in the grade. The results obtained from these analyses were essentially the same.

We found that these variables—monitoring, security, and severity of consequences for violation of school policy—showed little systematic association with actual substance use, both in general and at school. It is possible that the lack of association may reflect the fact that there was little variance among schools in these variables. Therefore, it is important to note that the lack of consistent associations should not be interpreted to mean that these measures are ineffective in reducing alcohol and marijuana use among students. It may simply mean that most schools are, in fact, all about equally effective (or ineffective).

Contrary to our hypothesis, schools that adopt a variety of supportive measures, such as providing several services and care providers, are not, in general, lower in substance use. There is greater variance among schools in the number of care providers and services than is the case for the punitive measures, so it is unlikely that a lack of variance can account for the lack of systematic significant associations.

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TABLES

Table 1

Actions Taken by Schools When Their Alcohol and Drug Use Policy Is Violated the First Time (Entries Are Percentages)

Severity scale	Action taken	Alcohol use			Drug use		
		8th grade	10th grade	12th grade	8th grade	10th grade	12th grade
1	a. Warning	44.9	38.7	43.1	41.0	40.6	40.9
2	b. Parents notified	94.7	95.3	93.8	93.5	94.8	92.5
	c. Administrator notified	92.2	91.0	90.3	91.0	89.2	88.5
	d. Student meets counselor	54.1	50.9	46.5	54.9	50.5	50.4
	e. Parents meet school officials	84.9	80.6	80.1	85.3	83.5	79.2
3	f. Referred to assistance program	48.6	57.5	54.7	57.6	62.7	60.4
	g. Participate in education program	37.1	46.2	44.0	43.3	52.4	51.6
4	h. Suspended from extracurricular activities	73.9	70.8	79.2	73.9	74.1	78.8
	i. In-school detention	32.8	24.8	32.5	31.8	24.8	29.5
	j. Suspension from school	79.6	83.5	78.2	78.4	84.4	80.0
5	k. Law enforcement notified	53.1	54.7	59.6	82.4	77.8	80.4
6	l. Sent to alternative program	11.2	11.0	18.1	23.6	14.8	27.1
7	m. Expelled	14.5	7.6	13.3	40.4	21.6	32.9

Table 2
Prevalence of Marijuana and Alcohol Use (1998–2001) (Entries Are Percentages)

	8th grade N = 29,822 Mean	10th grade N = 22,964 Mean	12th grade N = 23,594 Mean
Prevalence of marijuana in the past 30 days	8.9	18.8	21.3
Prevalence of heavy drinking in past 2 weeks	12.3	23.8	27.8

	8th grade N = 9,900	10th grade N = 7,650	12th grade N = 3,949
Proportion of students using marijuana or any other drugs at school during the day in the last year	3.1	8.3	
Proportion of students using marijuana in school in the last year			7.5
Proportion of students using alcohol at school during the day in the last year	3.2	7.6	
Proportion of students using alcohol at school in the last year			5.7

Table 3

Mean and Standard Deviations for School Administrators' Report of Policies and Practices in Schools

	8th grade N = 246 Mean (SD)	10th grade N = 212 Mean (SD)	12th grade N = 226 Mean (SD)
Monitoring alcohol use	4.43 (.72)	4.25 (.78)	4.35 (.63)
Monitoring drug use	4.47 (.73)	4.25 (.86)	4.35 (.69)
Number of security measures	4.52 (1.91)	4.00 (2.03)	4.27 (1.90)
Number of care providers (# FTE)	3.10 (1.99)	4.60 (3.12)	4.73 (3.42)
Number of services provided	5.05 (2.83)	5.68 (2.83)	5.83 (2.84)
Severity of consequences for violating school alcohol use policy	5.46 (1.01)	5.47 (0.99)	5.58 (0.99)
Severity of consequences for violating school drug use policy	6.08 (.94)	5.94 (0.83)	6.13 (0.85)

Table 4

School Policies and Practices as Predictors of the Log-Odds of Students' Heavy Drinking and Marijuana Use in the Past 30 Days

	Final Between-School Model Regression Coefficients					
	Heavy drinking			Marijuana use		
	8th grade	10th grade	12th grade	8th grade	10th grade	12th grade
Fixed Effect						
Average level of substance use	-2.268***	-0.768***	-0.498*	-3.070***	-1.486***	-1.284***
School-level predictors						
• Number of security measures	0.042*	0.007	-0.041*	0.038	0.032	-0.018
• Level of monitoring	-0.052	0.020	-0.027	0.067	-0.056	-0.063
• Severity of action taken	0.038	0.006	0.027	0.023	0.002	-0.020
• Number of care providers (FTE)	0.023	-0.012	-0.011	-0.013	-0.017	0.003
• Number of services	-0.012	0.010	0.016	0.022	0.006	0.021
• Teachers' prevention of drug use (Students' perception aggregated)			-0.022			-0.031
• Severity of consequences (Students' perception aggregated)			-0.001			0.118
• Year 1998	0.143	-0.119	0.093	0.122	0.004	0.083

Table 4 (continued)

| | Final Between-School Model Regression Coefficients | | | | | |
| | Heavy drinking | | | Marijuana use | | |
	8th grade	10th grade	12th grade	8th grade	10th grade	12th grade
Fixed Effect						
• Year 1999	0.221	-0.001	0.024	0.063	0.060	0.036
• Year 2000	0.111	-0.067	0.011	-0.169	-0.017	0.009
• Parental education (aggregated)	-0.016	0.009	0.017	0.005	0.022***	0.014
• School size	-0.037	-0.008	-0.042	0.007	0.001	-0.019
• Urbanicity	-0.148**	-0.078*	0.036	0.002	0.015	0.172***
• Type of school (public/private)	0.109	-0.002	0.177	0.670	0.198	0.156
Student-level predictors						
• Parental education	-0.020***	-0.011***	-0.005	-0.023***	-0.014***	-0.006**
• Black	-0.631***	-1.002***	-1.128***	-0.042	-0.449***	-0.168*
• Other	0.162***	-0.130**	-0.290***	0.066	-0.043	-0.142**
• Female	-0.103**	-0.350***	-0.595***	-0.376***	-0.350***	-0.375***

*** = $p < .001$, ** = $p < .01$, * = $p < .05$

Table 5

School Policies and Practices as Predictors of the Log-Odds of Students' In-School Drinking, In-School Marijuana Use (12th Grade), and In-School Marijuana or Other Drug Use (8th and 10th Grades)

	Final Between-School Model Regression Coefficients					
	In-school drinking			In-school marijuana or other drug use		In-school marijuana use
Fixed Effect	8th grade	10th grade	12th grade	8th grade	10th grade	12th grade
Average level of substance use	-4.834***	-2.882***	-3.705***	-4.955***	-3.043***	-3.034***
School-level predictors						
• Number of security measures	0.039	0.052	-0.016	0.059	0.091*	0.042
• Level of monitoring	-0.045	-0.139*	-0.101	0.069	-0.107~	-0.039
• Severity of action taken	-0.170**	0.040	-0.024	0.018	-0.076	-0.242**
• Number of care providers (FTE)	0.077*	-0.018	0.027	0.006	-0.029	-0.032
• Number of services	0.005	0.038	-0.017	0.042	0.021	-0.047
• Teachers' prevention of drug use (Students' perception aggregated)			0.020			0.031
• Severity of consequences (Students' perception aggregated)			0.074			0.181
• Year 1998	0.346	0.144	0.288	0.661**	0.106	0.075

Table 5 (continued)

Fixed Effect	Final Between-School Model Regression Coefficients					
	In-school drinking			In-school marijuana or other drug use		In-school marijuana use
	8th grade	10th grade	12th grade	8th grade	10th grade	12th grade
• Year 1999	0.427*	0.043	0.477*	0.537**	-0.044	0.023
• Year 2000	0.090	-0.009	0.075	0.444*	-0.101	-0.085
• Parental education (aggregated)	-0.020	0.008	0.017	-0.010	0.015	0.022
• School size	0.097	0.018	-0.107	0.092	0.011	-0.058
• Urbanicity	-0.141	-0.014	0.071	-0.004	0.003	0.259**
• Type of school (public/private)	0.899	0.124	0.708**	0.663	0.543*	0.473*
Student-level predictors						
• Parental education	-0.017***	-0.010**	-0.003	-0.033***	-0.012**	-0.008
• Black	-0.238	-0.069	-0.137	-0.390	-0.263	-0.306
• Other	0.245	0.369**	0.413**	0.397**	-0.271*	0.243
• Female	-0.372**	-0.367***	-0.200	-0.520***	-0.463***	0.064

*** = $p < .001$, ** = $p < .01$, * = $p < .05$