

School-related Factors and Methamphetamine Use: A Study of High School Seniors

Jarrold Stanley

Celia Lo, Ph.D.
Professor of Criminal Justice

This study sought to identify the factors that influence a high school senior's decision to try methamphetamine. Using data from the 2005 Monitoring the Future survey, a model was developed and tested using logistic regression techniques. Social bonding variables, including absenteeism, cognitive confidence, educational efficacy, and goals, were first entered into the model with the control variables, race and gender. Social learning variables, including peer use, perceived risk, and prior marijuana use, were entered in the model in a second step. The results showed that while absenteeism and educational efficacy had some impact on the likelihood of methamphetamine use, these effects were mediated by the more proximal role of the social learning variables. Policy implications are briefly discussed.

Introduction

Data from the 2006 Monitoring the Future (MTF) study show a 4.4% lifetime prevalence for methamphetamine (MA) use among high school seniors (Johnston, O'Malley, Bachman, & Schulenberg, 2007), but recent studies indicate that MTF may be underreporting (Iritani, Hallfors, & Bauer, 2007). In spite of MTF's reported declines in lifetime use of MA among individuals under the age of 19, the Treatment Episodes Data Set (TEDS) describes annual increases in the number of emergency department (ED) admissions mentioning MA in this age group. In 2005, 11.8% of ED admissions mentioning MA were 18 years old or younger, and 52.4% of all ED admissions listing MA as the primary substance of abuse reported having first tried MA before age 19.

The use of MA by adolescents represents a significant problem because of the societal, health, academic, and other associated costs (Lineberry & Bostwick, 2006; Miller, 2005). Among all drug-using students, those who use MA are more than twice as likely to experience drug-related consequences, such as trouble in school or being arrested, than students who do not use MA (Oetting et al., 2000). Early onset of drug use has also been correlated with chronic use later on in life, as well as with higher rates of delinquency (Catalano, Kosterman, Hawkins, Newcomb, & Abbott, 1996; Ford, 2005; McCrystal, Percy, & Higgins, 2006).

The social context of school plays a pivotal role in a student's decision to try MA (Lilly, Cullen, & Ball, 2007). The bonds formed within the context of the school social environment can be some of the most influential and effective social controls (Ellickson, Collins, & Bell, 1999; Murray & Belenko, 2005), but these same interactions can also act as substantial risk factors. Normative rates of drug use within the school (Allison et al., 1999; Murray & Belenko, 2005), academic failure (Hemphill, Toumbourou, Herrenkohl, McMorris, & Catalano, 2006; Murray & Belenko, 2005), and schools of poor quality (Durlak, 1998) are just a few of the school-related risk factors for increased incidence of drug use.

Studies of the efficacy of preventative education programs have shown that early education about the dangers of MA and correcting students' views of normative drug use among their peers can have significant results (Allison et al., 1999; Hawkins, Catalano, & Miller, 1992; Leone, 2006). Integral to the success of these programs is the identification of those high-risk populations that are most likely to try MA and the warning signs that can portend use of the drug. The model developed in this study was tested in its ability to accurately pinpoint individuals with a greater likelihood of trying MA.

Using data from the 2005 MTF survey (only summary data were available for 2006 at this study's inception), this study sought to develop a model to explain why some high school seniors have chosen to try MA at some point in their lifetime, putting special emphasis on factors relevant to students' day-to-day experiences within the context of the school environment. The results of this study should explain the impact of enacting the role of "student" on the student's decision to try MA, offer insights into the effective treatment and prevention of MA use among high school students, and elaborate on the policy implications related to implementing these findings.

Literature Review

School-related factors can play an important role in a student's decision to try MA. Durlak (1998) weighed school-level factors, such as school quality, even more heavily than individual-level factors such as low motivation or low IQ in a student's decision to initiate drug use. Factors such as excessive absences and high perceived rates of normative drug use among a student's peers can heavily influence substance use (Bryant & Zimmerman, 2002). Adolescent substance use has been linked to perceptions of below average academic performance, actual academic failure, and lower scores on scales of self efficacy (Chung & Elias, 1996; Durlak, 1998; Hemphill, et al., 2006; Miller & Plant, 1999). The relationship seems to be reciprocal, with academic failure and perceived below-average school performance acting as risk factors for drug use, and drug use, in turn, further increasing the likelihood of academic failure and low self-efficacy. School and student characteristics have an additive influence on substance use (Kairouz & Adlaf, 2003).

Many of these school-related factors can be indicators of social control and differential association. Commitment to school is among the first steps in building the bond to conventionality. Commitment indicates the extent to which students feel they have something to gain from their continued investment of time and effort in school (Lilly et al., 2007). As Drapela (2005) showed in her study of high school dropouts, simply being in school shows a certain level of commitment to conventionality.

In Hirschi's (1969) social control theory, he described school as being one of the primary institutions for social bonding. Through attachment, commitment, involvement, and belief, a student builds bonds to conventionality that discourage engagement in deviant behaviors, such as drug use (Hirschi, 1969). Assent to the norms of the school culture and holding these norms in some esteem (Hawkins, Lishner, Catalano, & Howard, 1985; Lilly, Cullen, & Ball, 2007) is a direct measure of bonding in the form of belief as described by Hirschi (1987). As a student begins to care less about his or her performance in school, the social bond is weakened, further feeding the cycle of drug use and lowered self efficacy. Engaging in delinquent behaviors also erodes social bonds, which results in higher rates of drug use. In turn, this increase in drug use further degrades the social bonds, leading to an increased incidence of delinquent behaviors (Erickson, Crosnoe, & Dornbusch, 2000; Ford, 2005).

Goals and aspirations for the future are indicators of bonding (Hirschi, 1969; Massey & Krohn, 1986). Students who intend to go to college or are married show lower rates of drug use (Hawkins, et al., 1985; Wu,

Schlenger, & Galvin, 2006). Wu's (2006) study found that, among 16- to 23-year-olds, being unmarried increased the likelihood of past year MA use by 60%. This plays into Hirschi's (1969) concept of commitment to and belief in conventional societal goals as a form of social control. Having such goals indicates an investment in the norms of conventional society, and this stake can be jeopardized by engaging in deviant behaviors such as drug use.

In addition to social bonding, social learning, through mechanisms such as differential association, plays an important role in predicting deviance and drug use. Oetting (1998) noted that deviant behaviors such as drug use are primarily transmitted through socialization with peer clusters. This is especially true in late adolescence, as individuals shift their focus from home to school and peers (Jang, 1999). Perceived normative rates of drug use among students' peers and the level of risk students associate with trying various drugs are also frequently related to rates of use (Allison et al., 1999; Ellickson, Collins, & Bell, 1999; Hawkins et al., 1985; Menares, Thiriot, & Aguilera-Torres, 1997; Shilts, 1991).

Adolescent drug use rarely occurs in a vacuum (Teevan & Dryburgh, 2000). Students' varying associations with deviant peers and their level of involvement within their peer network significantly impact substance use (Ennett et al., 2006; Menares et al., 1997). Students with a greater number of drug-using peers tend to discount the danger of drug use, thereby increasing their own likelihood of trying illicit substances (Menares et al., 1997). Students who believe that many of their peers engage in drug use are more likely to use drugs themselves (Menares et al., 1997). A student's level of perceived risk associated with drug use is indicative of his or her exposure to conditions which are favorable or unfavorable toward the behavior as defined in Akers's social learning theory (Akers, 2000). Because of significant overlap between the school and peer environments (Jang, 1999), school is a valuable source of social bonding and social learning for adolescents.

Akers (1999) examined the interplay between social bonding, social learning, and marijuana use, and found social learning to explain a much greater proportion of the variance. This was supported by the work of Erickson, Crosnoe, and Dornbusch (2000), which found that the effects of social bonding on deviance were indirect, with strong social bonding reducing associations with deviant peers and lessening deviant peers' influence.

Past behavior influences future decisions, such as the progression from so-called "soft" drugs to their harder alternatives (Baker et al., 2005; Ellickson, Collins, & Bell, 1999; Ford, 2005; Iritani, et al., 2007). The

most commonly used drug among older adolescents is marijuana (Johnston et al., 2007). Marijuana has long been heralded as one of the “gateway drugs.” Numerous studies have linked early marijuana use to the use of harder drugs later on (Allison et al., 1999; Booth, Leukefeld, Falck, Wang, & Carlson, 2006; Ellickson, Collins, & Bell, 1999; Herman-Stahl, Krebs, Kroutil, & Heller, 2006; Iritani et al., 2007). Herman-Stahl and others (2006) have linked marijuana use specifically to increased rates of nonprescription stimulant and MA use among adolescents. The ready availability of marijuana combined with a student’s decision to use it can be the first step towards harder drugs, including MA (Ellickson et al., 1999).

It is important to control for race and gender when considering students’ drug use habits, as usage rates vary both within and among these groups (Brecht, O’Brien, von Mayrhauser, & Anglin, 2004; Cernkovich & Giordano, 1992; Jang, 2002; Kaufman & Cooper, 2001).

After reviewing the past research, three hypotheses were developed regarding the decision by a high school senior to try MA. First, social bonding variables play an important role in the decision to try MA. Students who have tried MA show weaker bonds to school and to conventionality in general. Second, social learning also influences students’ decision to try MA. Students who have used drugs in the past, have a peer group comprised primarily of drug users, or who have pro-deviant views regarding drug use are more likely to try MA. Third, social bonding variables have a more distal effect on MA initiation and will be mediated through the more proximal social learning variables.

Method

Design and Sample

This project entailed an analysis of high school seniors using the 2005 12th-grade data from the Monitoring the Future (MTF) study (Johnston, et al., 2006). The University of Michigan Institute for Social Science Research has administered the MTF survey annually since 1975 to a nationally representative sample of students from about 130 high schools across the country. By using a broad array of variables and surveying on an ongoing basis, MTF seeks to detect and report trends in drug use among high school students over time.

The survey was administered in seven parts: a core data set, answered by all participants, and six additional forms, each addressing slightly different areas of interest. Every participant in the study answered the core form and the questions on one of the six additional forms. This resulted

in approximately 15,378 respondents for the core data, and subgroups of about 2,500 for each of the ancillary forms. Because of the sampling process, the findings from each of the ancillary forms can be generalized to the rest of the sample with a fair amount of accuracy.

The selection of the survey sample was done in three stages. First, geographic regions are selected from areas called primary sampling units (PSUs). These PSUs are comprised of counties or metropolitan statistical areas (MSAs) as defined by the U.S. Census. Second, a probability sample of schools based on the size of the senior class was selected from each geographic area. Finally, approximately 400 seniors from each selected school were randomly chosen to take the survey. In the event that a given senior class was smaller than 400 students, the survey was generally administered to all seniors. Those schools chosen for data collection were asked to participate for two consecutive years.

Measures

The dependent variable for this study was lifetime use of MA. Respondents were asked in what grade they first tried MA. Responses ranged from sixth to twelfth grade, or never. Answers were recoded into a dummy variable, with all who responded “never” assigned to 0, indicating that the respondent had never used MA, and all others assigned to 1, indicating that the respondent had tried MA at some time in the past. See Appendix A for a precise description of the questions asked for each variable.

Race and gender were used as control variables. Dummy measures were created for both. For the race variable, 1=“Black,” and 0=“Non-Black.” The gender variable was coded such that 0=“Female” and 1=“Male.” The independent variables were classified into two groups, social bonding variables and social learning variables. Indices were developed by grouping together relevant variables from MTF based on their face and content validity. Factor analysis was used to confirm that each of the component variables belonged together, and internal consistency was checked using Cronbach’s Alpha.

The social bonding variables included Absenteeism, Cognitive Confidence, Educational Efficacy, and Goals. Each of these measures was an indicator of one of the tenets of Hirschi’s (1969) social bonding theory: involvement, belief, and commitment. Absenteeism was employed to measure the number of days/classes missed due to skipping class during the four weeks prior to administration of the survey. This continuous variable showed the degree to which each student was involved in school with a relatively high reliability ($\alpha=.709$, range=11). Cognitive Confidence

was an index comprised of questions asking the students about their perceptions of their own academic and intellectual abilities as compared to their peers ($\alpha=.845$, range=12), and was used as an indication of a commitment to conventionality. The Educational Efficacy index was developed using variables which measured students' attitudes toward school and their belief in education as a means to a positive end ($\alpha=.808$, range=30). The Goals index comprised questions about future aspirations for marriage and family, career, and other examples of commitment to conventionality ($\alpha=.644$, range=15).

The social learning variables were Peer Use, Perceived Risk, and Prior Marijuana Use. Each of these variables was an indicator of social learning, as defined in Akers's (1977) social learning theory. Peer Use asked respondents about their friends' use of cigarettes, marijuana, crack, cocaine, and alcohol, indicating attention paid to potential behavioral models ($\alpha=.795$, range=20). Perceived Risk queried respondents on how risky the respondent felt it was to try a number of illicit substances once or twice, such as marijuana, cocaine powder, crack, and heroin without a needle ($\alpha=.813$, range=16). The level of risk associated with each of these substances demonstrated individual retention and internalization of pro- or anti-drug attitudes. Prior Marijuana Use could be seen as an indicator of prior drug use and differential association with drug-using peers. Prior Marijuana Use was measured as a dummy variable, where 0="No use" and 1="Prior use."

Data Analysis

Logistic regression analysis was used to evaluate the model for this study. A two-step model was developed to explain MA use among high school seniors. The control and social bonding variables were entered in the first step, followed by the social learning variables in the second. A two-step model was used because of the hypothesized distal and proximal effects of the social bonding and learning variables, respectively. A two-step model allowed us to show the effects of the social bonding variables, which would have been masked by the effects of the social learning variables if the analysis had been performed in only a single step.

Results

Approximately 3.4% (78) of the 2,350 students surveyed indicated they had tried MA at some point in their lifetime. Table 1 gives the mean, standard deviation, and total number of respondents for all the variables in the study. Some measures were coded as dichotomous variables, in which case the percentage of respondents who were coded as 1 is listed.

Table 1. Descriptive Statistics for Dependent and Independent Variables

Variable	Mean or %	SD	N
Meth Use	3.4%	.18	2350
Black	11.7%	.322	2095
Male	47%	.499	2363
Absenteeism	3.29	2.07	2217
Cognitive Confidence	9.97	2.24	2296
Educational Efficacy	25.4	5.28	2126
Goals	16.98	2.47	2513
Peer Use	11.2	3.52	2349
Perceived Risk	12.07	3.05	2138
Prior Marijuana Use	45%	.5	2466

A low level of school absenteeism was reported by the respondents, with most students missing no days of school in the four weeks prior to the survey. Scores on the Cognitive Confidence index ranged from 2 to 14 and were generally high, with a mean of 9.97, placing most responses in the “Slightly Above Average” category. The Goals index, which ranged from 5 to 20, had a mean of 16.98, indicating a strong normative commitment to conventionality within the sample. Educational Efficacy ranged from 7 to 37 with a mean of 25.4, demonstrating relatively high levels of belief in education. The range for Peer Use was from 5 to 25 with a mean of 11.2. Perceived Risk scores ranged from 4 to 20 and averaged 12.07. Finally, 45 per cent of the students had tried marijuana at some point in the past.

To determine the likelihood of MA use, the dependent variable, Meth Use, was first regressed on the social bonding and control variables, shown in Table 2. Two social bonding variables were found to be statistically significant in the step-1 model. The Educational Efficacy index had a significant negative relationship with MA use, wherein higher regard for school showed lower rates of MA use. Absenteeism was strongly associated with MA use, with those students having a greater number of absences during

the four weeks preceding survey administration reporting a higher likelihood of MA use. In the second step, the social learning variables were added to the model.

The step-2 model included the social learning variables, along with the social bonding and control variables. In this model, all of the social learning variables reached statistical significance, but none of the social bonding or control variables did so. Higher levels of drug use among peers and prior marijuana use were associated with the use of MA. Students who scored higher on the Perceived Risk index were less likely to try MA. Odds ratios were obtained, indicating the increase or decrease in the likelihood of MA use as a result of each one-point increase in the independent variable.

Table 2. Logistic Regression of Meth Use on Independent Variables

Variable	Step 1			Step 2		
	b	SE	OR	b	SE	OR
Controls						
Black	-.679	.751	.507	-.474	.798	.623
Male	.142	.317	1.153	-.196	.358	.822
Social Bonding						
Absenteeism	.202**	.055	1.224	.002	.063	1.002
Cognitive Confidence	-.065	.071	.937	-.006	.075	.994
Educational Efficacy	-.059*	.029	.937	.011	.034	1.011
Goals	-.063	.06	.939	-.020	.069	.98
Social Learning						
Peer Use				.283**	.061	1.327
Perceived Risk				-.143**	.061	.867
Prior Marijuana Use				.749**	.151	2.115
Intercept	-1.275	1.243	.279	-9.393	2.039	.000

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

The results generated in the step-1 model partially supported the proposed hypothesis that social bonding factors affect students' lifetime MA use. The hypothesized relationships between social learning and MA use were strongly supported in the step-2 model. The results confirmed the hypothesis that social learning variables mediate the effects of social bonding factors on students' MA use. After entering the social learning variables into the model, Absenteeism and Educational Efficacy became non-significant. All four social bonding variables did not show any significant impact on students' lifetime MA use in our final model.

Discussion

This research builds on the existing body of knowledge about MA by adding some insight into how experiences in the school and the school environment can impact a student's decision to try MA. The information provided by this study illuminates key areas on which drug use prevention and education programs should focus. If a teacher or administrator is paying careful attention to each student, he or she is more likely to notice if a previously well-behaved student starts spending more time with peers who are known drug users or experiences an uncharacteristic spike in absenteeism, and this becomes an opportunity for early intervention, such as parent conferences or referral to a guidance counselor. This small step could have an enormous effect, preventing further fall into delinquency.

The study findings showed the link between peer use and drug use. Students often believe that many more of their friends are engaging in illicit drug use than is actually the case, so by correcting students' perceptions of the normative rate of drug use among their peers, overall usage rates can effectively be lowered (Allison et al., 1999). In addition to increased personal attention and correcting students' perceptions of normative rates of use among their peers, educating about the dangers of specific drugs is also likely to have an impact on MA initiation or the initiation of other drug use leading to MA. It is integral to the success of any deterrent program that as many risk factors as possible be minimized, while at the same time maximizing social supports (Hawkins et al., 1992).

Future research should capture more specific data on MA prevalence. Questions asking explicitly about lifetime, annual, and past 30 days prevalence should be included in future surveys, as well as in-depth indicators of the state of the student's school environment and social networks, perhaps integrating data from faculty and staff regarding MA in the school. This more robust data set, coupled with a longitudinal study, would allow for more precise causal analysis.

This study did have a few limitations. Many of the issues inherent to using a secondary data set were encountered. The multi-form design of MTF does not allow for comparisons across forms. The sampling design and lack of a precise measure of MA use may have altered the results of the study. Neither the Core Form nor Form 1 included a question specific to lifetime MA use, so it was inferred from a question which asked, "In what grade did you first try crystal methamphetamine?" This indirect measure resulted in a prevalence of 3.4% as opposed to the 4.5% reported in Volume I of the Monitoring the Future 2005 National Survey Results. MA

is sometimes subdivided into powdered MA and crystal MA, which could have resulted in a response of “no” from those students who had only tried the powdered form. MTF also excludes high school dropouts from their sample. While this probably created an underestimate of MA use in the examined age cohort, since the study focused primarily on school-related factors, our attention was paid to understanding students’ MA use.

References

- Akers, R. L. (1977). *Deviant behavior: A social learning approach* (2nd ed.). Belmont, CA: Wadsworth.
- Akers, R. L. (2000). *Criminological theories: Introduction, evaluation, and application* (3rd ed.). Los Angeles: Roxbury.
- Akers, R. L., & Lee, G. (1999). Age, social learning, and social bonding in adolescent substance use. *Deviant Behavior*, 20(1), 1 - 25.
- Allison, K. W., Crawford, I., Leone, P. E., Trickett, E., Perez-Febles, A., Burton, L. M., et al. (1999). Adolescent substance use: Preliminary examinations of school and neighborhood context. *American Journal of Community Psychology*, 27(2), 111-141.
- Baker, A., Lee, N. K., Claire, M., Lewin, T. J., Grant, T., Pohlman, S., et al. (2005). Brief cognitive behavioural interventions for regular amphetamine users: A step in the right direction. *Addiction*, 100(3), 367-378.
- Booth, B. M., Leukefeld, C. G., Falck, R. S., Wang, J., & Carlson, R. G. (2006). Correlates of rural methamphetamine and cocaine users: Results from a multistate community study. *Journal of Studies on Alcohol*, 67(4), 493-501.
- Brecht, M. L., O’Brien, A., von Mayrhauser, C., & Anglin, M. D. (2004). Methamphetamine use behaviors and gender differences. *Addictive Behaviors*, 29(1), 89-106.
- Bryant, A. L., & Zimmerman, M. A. (2002). Examining the effects of academic beliefs and behaviors on changes in substance use among urban adolescents. *Journal of Educational Psychology*, 94(3), 621-637.

- Catalano, R. F., Kosterman, R., Hawkins, J. D., Newcomb, M. D., & Abbott, R. D. (1996). Modeling the etiology of adolescent substance use: A test of the social development model. *Journal of Drug Issues, 26*(2), 429-455.
- Cernkovich, S. A., & Giordano, P. C. (1992). School bonding, race, and delinquency. *Criminology, 30*(2), 261-291.
- Chung, H. H., & Elias, M. (1996). Patterns of adolescent involvement in problem behaviors: Relationship to self-efficacy, social competence, and life events. *American Journal of Community Psychology, 24*(6), 771-784.
- Drapela, L. A. (2005). Does dropping out of high school cause deviant behavior? An analysis of the national education longitudinal study. *Deviant Behavior, 26*(1), 47-62.
- Durlak, J. A. (1998). Common risk and protective factors in successful prevention programs. *The American Journal of Orthopsychiatry, 68*(4), 512-520.
- Ellickson, P. L., Collins, R. L., & Bell, R. M. (1999). Adolescent use of illicit drugs other than marijuana: How important is social bonding and for which ethnic groups? *Substance Use & Misuse, 34*(3), 317-346.
- Ennett, S. T., Bauman, K. E., Hussong, A., Faris, R., Foshee, V. A., Cai, L., et al. (2006). The peer context of adolescent substance use: Findings from social network analysis. *Journal of Research on Adolescence, 16*(2), 159-186.
- Erickson, K. G., Crosnoe, R., & Dornbusch, S. M. (2000). A social process model of adolescent deviance: Combining social control and differential association perspectives. *Journal of Youth and Adolescence, 29*(4), 395-425.
- Ford, J. A. (2005). Substance use, the social bond, and delinquency. *Sociological Inquiry, 75*(1), 109-128.

- Hawkins, J. D., Catalano, R. F., & Miller, J. Y. (1992). Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: Implications for substance abuse prevention. *Psychological Bulletin, 112*(1), 64-105.
- Hawkins, J. D., Lishner, D. M., Catalano, R. F., & Howard, M. O. (1985). Childhood predictors of adolescent substance abuse: Toward an empirically grounded theory. *Journal of Children in Contemporary Society, 18*(1-2), 11-48.
- Hemphill, S. A., Toumbourou, J. W., Herrenkohl, T. I., McMorris, B. J., & Catalano, R. F. (2006). The effect of school suspensions and arrests on subsequent adolescent antisocial behavior in Australia and the United States. *Journal of Adolescent Health, 39*(5), 736-744.
- Herman-Stahl, M. A., Krebs, C. P., Kroutil, L. A., & Heller, D. C. (2006). Risk and protective factors for nonmedical use of prescription stimulants and methamphetamine among adolescents. *Journal of Adolescent Health, 39*(3), 374-380.
- Hirschi, T. (1969). *Causes of delinquency*. Berkeley: University of California Press.
- Hirschi, T. (1987). Explaining delinquency and drug-use. *Criminology, 25*(1), 193-201.
- Iritani, B. J., Hallfors, D. D., & Bauer, D. J. (2007). Crystal methamphetamine use among young adults in the USA. *Addiction, 102*(7), 1102-1113.
- Jang, S. J. (1999). Age-varying effects of family, school, and peers on delinquency: A multilevel modeling test of interactional theory. *Criminology, 37*(3), 643-685.
- Jang, S. J. (2002). Race, ethnicity, and deviance: A study of Asian and Non-Asian adolescents in America. *Sociological Forum, 17*(4), 647-680.

- Johnston, L. D., O'Malley, P. M., Bachman, J. G., & Schulenberg, J. E. (2006). *Monitoring the future: National survey results on drug use, 1975-2005. Volume I: Secondary school students* (NIH Publication No. 06-5883). Bethesda, MD: National Institute on Drug Abuse.
- Johnston, L. D., O'Malley, P. M., Bachman, J. G., & Schulenberg, J. E. (2007). *Monitoring the future: National results on adolescent drug use: Overview of key findings, 2006* (NIH Publication No. 07-6202). Bethesda, MD: National Institute on Drug Abuse.
- Kairouz, S., & Adlaf, E. M. (2003). Schools, students and heavy drinking: A multilevel analysis. *Addiction Research & Theory, 11*(6), 427-439.
- Kaufman, J. S., & Cooper, R. S. (2001). Commentary: Considerations for use of racial/ethnic classification in etiologic research. *American Journal of Epidemiology, 154*(4), 291-298.
- Leone, L. (2006). Two studies have proved that drug prevention programs conducted in middle school can reduce methamphetamine use by rural adolescents later in their lives. *Corrections Compendium, 31*(5), 46-47.
- Lilly, J. R., Cullen, F. T., & Ball, R. A. (2007). *Criminological theory: Context and consequences*. Thousand Oaks: SAGE Publications.
- Lineberry, T. W., & Bostwick, J. M. (2006). Methamphetamine abuse: A perfect storm of complications. *Mayo Clinic Proceedings, 81*(1), 77-84.
- Massey, J. L., & Krohn, M. D. (1986). A longitudinal examination of an integrated social-process model of deviant-behavior. *Social Forces, 65*(1), 106-134.
- McCrystal, P., Percy, A., & Higgins, K. (2006). Drug use patterns and behaviours of young people at an increased risk of drug use during adolescence. *International Journal of Drug Policy, 17*(5), 393-401.

- Menares, J., Thiriot, E., & Aguilera-Torres, N. (1997). Factors related to the potential risk of trying an illicit drug among high school students in Paris. *European Journal of Epidemiology*, *13*(7), 787-793.
- Miller, P., & Plant, M. (1999). Truancy and perceived school performance: An alcohol and drug study of UK teenagers. *Alcohol and Alcoholism*, *34*(6), 886-893.
- Miller, M. C. (2005). What are the dangers of methamphetamine? *Harvard Mental Health Letters*, *22*(2), 8.
- Murray, L. F., & Belenko, S. (2005). Casastart: A community-based, school-centered intervention for high-risk youth. *Substance Use & Misuse*, *40*(7), 913-933.
- Oetting, E. R., & Donnermeyer, J. F. (1998). Primary socialization theory: The etiology of drug use and deviance. I. *Substance Use & Misuse*, *33*(4), 995-1026.
- Oetting, E. R., Deffenbacher, J. L., Taylor, M. J., Luther, N., Beauvais, F., & Edwards, R. W. (2000). Methamphetamine use by high school students: Recent trends, gender and ethnicity differences, and use of other drugs. *Journal of Child & Adolescent Substance Abuse*, *10*(1), 33.
- Shilts, L. (1991). The relationship of early adolescent substance use to extracurricular activities, peer influence, and personal attitudes. *Adolescence*, *26*(103), 613-613.
- Teevan, J. J., & Dryburgh, H. B. (2000). First person accounts and sociological explanations of delinquency. *Canadian Review of Sociology and Anthropology*, *37*(1), 77-93.
- Wu, L. T., Schlenger, W. E., & Galvin, D. M. (2006). Concurrent use of methamphetamine, MDMA, LSD, ketamine, GHB, and flunitrazepam among American youths. *Drug and Alcohol Dependence*, *84*(1), 102-113.

Appendix A

Description of Variables

Variable	Measurement
Absenteeism (Alpha .709)	<p>On a seven-point scale, where (1)="None" (2)="1 Day" (3)="2 Days" (4)="3 Days" (5)="4-5 Days" (6)="6-10 Days" (7)="11 or More"</p> <ul style="list-style-type: none"> • During the last four weeks, how many whole days of school have you missed because you skipped or cut? <p>On a six-point scale, where (1)="Not at all" (2)="1 or 2 times" (3)="3-5 times" (4)="6-10 times" (5)="11-20 times" (6)="More than 20 times"</p> <ul style="list-style-type: none"> • During the last four weeks, how often have you gone to school, but skipped a class when you weren't supposed to?
Cognitive Confidence (Alpha .845)	<p>On a seven-point scale, where (1)="Far Below Average" (2)="Below Average" (3)="Slightly Below Average" (4)="Average" (5)="Slightly Above Average" (6)="Above Average" (7)="Far Above Average"</p> <ul style="list-style-type: none"> • Compared with others your age throughout the country, how do you rate yourself on school ability? • How intelligent do you think you are compared with others your age?
Educational Efficacy (Alpha .808)	<p>On a seven-point scale, where (1)=Completely Dissatisfied (4)="Neutral" (7)=Completely Satisfied</p> <ul style="list-style-type: none"> • How satisfied are you with your educational experiences? <p>On a five-point scale, where (1)="Disagree" (2)="Mostly Disagree" (3)="Neither" (4)="Mostly Agree" (5)="Agree"</p> <ul style="list-style-type: none"> • Going to school has been an enjoyable experience for me • Doing well in school is important for getting a good job

Educational Efficacy (contd.)	<p>On a five-point scale, where (1)="I don't like school at all" (2)="I don't like school very much" (3)="I like school some" (4)="I like school quite a bit" (5)="I like school very much"</p> <ul style="list-style-type: none"> • How do you feel about going to school? <p>On a five-point scale, where (1)="Never" (2)="Seldom" (3)="Sometimes" (4)="Often" (5)="Almost always"</p> <ul style="list-style-type: none"> • How often do you feel the schoolwork you are assigned is meaningful and important? <p>On a five-point scale, where (1)="Very dull" (2)="Slightly dull" (3)="Fairly interesting" (4)="Quite interesting" (5)="Very exciting and stimulating"</p> <ul style="list-style-type: none"> • How interesting are most of your courses to you? <p>On a five point scale, where (1)="Not at all important" (2)="Slightly important" (3)="Fairly important" (4)="Quite important" (5)="Very important"</p> <ul style="list-style-type: none"> • How important do you think the things you are learning in school are going to be for your later life?
Goals (Alpha .644)	<p>On a four-point scale, where (1)="Not Important" (2)="Somewhat Important" (3)="Quite Important" (4)="Extremely Important"</p> <p>How important is each of the following to you in your life?</p> <ul style="list-style-type: none"> • Being successful in my line of work • Having a good marriage and family life • Being able to find steady work • Making a contribution to society • Finding purpose and meaning in my life

Male ²	On a two-point scale, where (1)=Male and (2)=Female <ul style="list-style-type: none"> • What is your sex?
Meth Use ³	Asked to indicate grade level during first occurrence, 6-12 or never: When (if ever) did you FIRST do each of the following things? Don't count anything you took because a doctor told you to. <ul style="list-style-type: none"> • Try crystal meth ("ice")
Peer Use (Alpha .795)	On a five-point scale, where (1)="None" (2)="A Few" (3)="Some" (4)="Most" (5)="All" How many of your friends would you estimate <ul style="list-style-type: none"> • Smoke cigarettes? • Smoke marijuana (pot, weed) or hashish? • Take "crack" cocaine? • Take cocaine powder? • Drink alcoholic beverages (liquor, beer, wine)?
Perceived Risk (Alpha .813)	On a five-point scale, where (1)="No Risk" (2)="Slight Risk" (3)="Moderate Risk" (4)="Great Risk" (5)="Can't Say, Drug Unfamiliar" How much would you say people risk harming themselves (physically or in other ways), if they <ul style="list-style-type: none"> • Try marijuana once or twice? • Try cocaine in powder form once or twice? • Try "crack" cocaine once or twice? • Try heroin once or twice without using a needle?
Prior Marijuana Use ⁴	On a seven-point scale, where (1)="0 Occasions" (2)="1-2 Occasions" (3)="3-5 Occasions" (4)="6-9 Occasions" (5)="10-19 Occasions" (6)="20-39 Occasions" (7)="40 or More" <ul style="list-style-type: none"> • On how many occasions, if any, have you used marijuana in your lifetime?
Black ⁵	On a three-point scale, where (1)=Black, (2)=White and (3)=Hispanic <ul style="list-style-type: none"> • How do you describe yourself?

¹Item reversed before summation

²Recoded into dummy variable where (1)=Male and (0)=Female

³Recoded into dummy variable where (1)=Has tried MA in the past and (0)=Never tried MA

⁴Recoded into dummy variable where (1)=Used and (0)=Never used

⁵Item recoded such that (1)=Black and (0)=Non-Black