DRUG USE IN MIDDLE SCHOOL: ASSESSING ATTITUDINAL AND BEHAVIORAL PREDICTORS*

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ABSTRACT

Generally speaking, theories of adolescent drug use emphasize either attitudinal variables, such as self-esteem or self control, or behavioral variables, such as interactions with delinquent peers. This research uses variables such as self-esteem, impulsiveness, parental attachment, commitment to education, and peer drug use to predict adolescent substance use. The analysis is conducted on a sample of 312 middle-school children from South Carolina. Results indicate that while attitudinal variables are important for predicting use, behavioral variables are superior predictors of adolescent drug use. Involvement in non-drug related crimes, associating with drug-using peers, and involvement in a recreational routine activity pattern, all behavioral variables, were the best predictors of adolescent drug use. Attachment was the best attitudinal predictor of drug use.

This research implies that dynamic models are needed to adequately explain the variation in adolescent drug use. Researchers and theorists are reminded that recreational drug use among adolescents is often a behavior that conforms to sub-group norms and not simply behavior that deviates from the dominant culture's norms.

We as a nation dedicate countless hours and billions of dollars each year to keep our youth from using drugs and to punish or rehabilitate those who do. We use guides and strategies, programs and commercials, and, yet, millions of youth still "experiment" with drugs. Despite all we know about why adolescents use drugs, we too often fail to understand a basic principle about adolescent drug use. By considering some leading sociological explanations of drug use, this principle can be highlighted.

Generally speaking, sociologists use two broad classes of theories to explain variations in illicit drug use. Although most theories tend to be somewhat eclectic, we can classify the theories based on their primary explanatory variables. One theoretical set uses social-psychological variables and personality traits to account for drug-using patterns. These theories rely on attitudinal variables to account for the variations in drug use. The second theoretical set emphasizes an individual's social relations and how the setting of drug use attracts or deters potential users. In general, these theories rely on behavioral variables to explain drug-using patterns. In this paper, some theoretical explanations that represent these two schools of thought on illicit drug use are outlined. Then, variables representing each theoretic "school" are used to predict illicit drug use among a randomly-selected sample of 312 middle-school children from a small city in South Carolina. While the analysis cannot be considered a critical test of competing theories because data limitations prohibit including all of the relevant variables the various perspectives discuss, it can offer a partial test of the theories' central assertions.

THEORIES OF DRUG USE:

Attitudinal-based Theories

Although there are several variants of attitudinal theories, three of the most prominent are the self degradation/self-esteem theory, the self-control theory, and the problem-behavior proneness theory. All of these theories locate the primary causal factor or factors for drug use within the individual's psyche and emphasize individualistic factors. It is the individual's perception of him or herself, and occasionally the social environment, that generate the motives and rationalizations for using illicit drugs.

Self-Degradation/Self-Esteem Theory

One set of social-psychological theories is the "inadequate personality theories." In short, these theories argue that drug-using individuals suffer from some personality flaw or inadequacy. Drug use is used in an attempt to escape this flaw; it is a defense mechanism and a means of compensating for their inferiority (see Wurmser 1980). Kaplan's (1975) self-degradation/self-esteem theory is a prime example of this line of thought. Kaplan maintains that all adolescents seek acceptance and approval for their behavior. However, when their behavior is defined as unacceptable by their parents, teachers or conforming friends, adolescents

will experience psychological distress. This distress produces feelings of self-rejection and, if left unresolved, low self-esteem. Distressed adolescents will either alter their behavior or withdraw from the source of the distress and develop a disposition toward deviance. Those adolescents that select the deviant path will likely drift toward a deviant peer group where their behavior is rewarded. In their deviant peer group, drug use will provide the distressed adolescents with a source of status and alleviate, at least temporarily, their sense of rejection. Thus, low self-esteem leads to a disposition toward deviance, participation in a drug-using peer group, and, eventually, drug use. Several empirical tests have found support for Kaplan's model. This support is generally found most often in longitudinal analyses (see Kaplan & Fukurai 1992; Kaplan & Johnson 1991; Kaplan, Johnson & Baily 1986, 1987; Vega, Apospori, Gil, Zimmerman, & Warheit 1996; Vega & Gil 1998; Miller, Alberts, Hecht, Trost & Krizek 2000; contrast Jang & Thornberry 1998).

Self-Control Theory

Another version of the "inadequate personality theory" is Gottfredson and Hirschi's (1990) "general theory of crime" or "self-control theory." Simply put, these authors argue that criminals and deviants lack the ability to regulate their behavior. That is, they lack self control. Claiming that levels of self-control are determined early in life and remain invariant over the life-course, Gottfredson and Hirschi (1990) argue that the correlations between deviant behavior, dangerous-but-legal behaviors, drug use and crime are so high because these are all manifestations of the same lack of self-control. Similarly, the correlations between crime and such factors as intelligence, educational attainment, divorce, and a host of other personal problems are due to these all being "manifestations of low self-control." In short,

> people who lack self-control will tend to be impulsive, insensitive, physical (as a opposed to mental), risk-taking, short-sighted, and nonverbal, and they will tend therefore to engage in criminal and analogous acts. (Gottfredson & Hirschi 1990 90)

In essence, self-control theory is a variant of rational choice theory. That is, those with low self-control are more likely to value the rewards of deviance over the punishments associated with it because they fail to properly calculate the negative outcomes of their behavior. As Gottfredson and Hirschi (1990 95) say,

> So, the dimensions of self-control are, in our view, factors affecting calculation of the consequences of one's acts. The impulsive or short-sighted person fails to consider the negative or painful consequences of his acts; the insensitive person has few negative consequences to consider; the less intelligent person also has fewer negative consequences to consider.

Thus, those with low self-control emphasize the immediate rewards associated with drug use or other deviant behaviors and fail to recognize the potential dangers or pains associated with the behavior. The inability to recognize the negative consequences of crime or drug use are "largely products of ineffective or incomplete socialization" (Gottfredson & Hirschi 1990 96). According to Gottfredson and Hirschi (1990 97), "the major 'cause' of low self-control thus appears to be ineffective child-rearing." To effectively socialize children, parents must feel an attachment to the child, provide supervision, recognize the child's deviant behavior, and punish the child's deviant acts.

The "general theory of crime" has produced numerous attempts to test it and various assertions made by Gottfredson and Hirschi. In general, these tests have been favorable, although several authors note that some of the more general claims of the theory are somewhat limited. Nevertheless, there is empirical support for the claim that low self-control is related to drug use, delinquency and crime (Arneklev, Grasmick & Bursik 1999; Gottfredson & Hirschi 1990; Hope & Damphousse 2002; Leeman & Wapner 2001; Mason & Windle 2002; Turner & Piquero 2002; Vazsonyi, Pickering, Junger & Hessing 2001; contrast Wang, Qiao, Hong & Zhang 2002).

Problem-Behavior Proneness

A third social-psychological perspective is more eclectic than Gottfredson and Hirschi's univariate theory. Jessor's (1979, 1987) *Problem-Behavior Proneness Theory* includes several psychological variables but

also begins to consider the social setting in which the adolescent is involved. Problem-behavior Proneness Theory asserts that drug users' personalities increase the likelihood that drugs and other types of deviant behavior will be attractive. According to the theory, there are three systems of psycho-social influence: the Personality System, the Perceived Environment System, and the Behavior System. Within each system, variables reflect either "instigations" to problem behavior or "controls" against it. Together the systems generate "proneness." The more prone to problem behavior, the greater the probability the adolescent will find drug use attractive and engage in the behavior.

Within the personality system there are two distal and one proximate "structures." The *instigation structure* is a "distal cause" of drug use and includes three variables: value toward academic achievement, value toward independence, and value toward peer affection. The *personal beliefs* structure centers on

> beliefs about the self, society, and self in relation to society. The conceptual role of such variables is to constrain against the instigations to engage in problem behavior. (Jessor & Jessor 1977 20)

And it includes the variables alienation, social criticism (the degree of acceptance or rejection of the values, norms, and practices of the larger society), and self-esteem. The *Personal Control Structure* includes the adolescents' attitudinal intolerance of deviance, religiosity, and perceptions of positive or negative functions of the problem behavior.

The Perceived Environment System includes the *distal environment structure* and the *proximal environment structure*. The distal environment structure includes the adolescents' perceived strictness and perceived sanctions for transgressions from parents and friends. The *proximal environmental structure* includes the social support for problem behavior available in the social environment. Low parental controls, low compatibility between parent and peer expectations, high peer versus parent influence, low parental disapprovals of different problem behaviors, and exposure to friends' approval for engaging in problem behavior all increase the likelihood of deviant behavior. Finally, the Behavior System includes the *problem-behavior structure* and the *conventional behavior structure*. Problem behaviors include the use of alcohol, marijuana, and other illicit drugs as well as engaging in other deviant behaviors. The conventional behaviors that control deviance include involvement in religious organizations and school.

If the three psycho-social systems generate "proneness," the adolescent is more likely to have

> a concern with autonomy, a lack of interest in the goals of conventional institutions, like church and school, a jaundiced view of the larger society, and a more tolerant view of transgression. (Jessor & Jessor 1980 109)

That is, drug users tend to be unconventional while non-users tend to be conventional (Jessor & Jessor 1980). As with the self-esteem theory, the problem-behavior proneness theory has received considerable empirical support over the years (Jessor & Jessor 1977, 1980; Donovan, Jessor & Costa 1991, 1993; Donovan 1996; Jessor, Chase & Donovan 1980; Jessor, Donovan & Coasta 1991).

Behavioral-Based Theories

While social-psychological theories emphasize individualistic factors and attitudinal variables, sociological theories of drug use typically stress structural factors and behavioral variables. As Goode (1999 100) notes when discussing sociological theories of drugs,

> the most crucial factor to be examined is not the characteristics of the individual, but the situations, social relations, or social structure which the individual is, or has been located.

Although there are others, two sets of social theories of drug use, social control/bond theory and differential association/social learning theory/subcultural theories, are discussed.

Social Control/Bond Theory

Hirschi's (1969) bond theory is most frequently classified as a sociological theory (e.g. Goode 1999). However, three of the four "elements of the bond" are attitudinal. Hirschi's well-known theory begins with the assumption that everyone has the motive to de-

viate because deviance is fun, exciting, and easy. Why, then, do we conform to normative standards most of the time? According to Hirschi, individuals conform because they are bonded to society through four "elements of the bond," which include *attachment, commitment, belief* and *involvement.* The greater the strength of the bond, the lower the probability that deviance will occur.

Attachment is the extent to which individuals value the opinions of conventional others such as parents, teachers, clergy, and peers. *Commitment* is the extent to which individuals pursue conventional goals within conventional institutions. The more committed one is to conventional institutions such as family, school, religion and community, the less likely he or she will deviate. *Belief* is the extent to which an individual holds the normative standards of the society as legitimate. Finally, *involvement* is extent to which individuals participate in conventional activities. According to Hirschi, drug use, or other deviant activity, is contained by these bonds. Hirschi's theory is one of the most influential and widely tested criminological theories (Kempf 1993). The theory has, generally speaking, received considerable empirical support (Agnew 1985; Hawdon 1996, 1999; LaGrange & White 1985; Marcos, Bahr & Johnson 1986; Kempf 1993).

The Routine Activity Perspective

According to the *routine activity perspective*, the routine activities in which individuals engage determine the probability of being victimized because they place individuals in situations that facilitate or are likely to encourage crime. Guardianship of one's self and belongings can be reduced because of the activities he or she routinely performs (see Cohen & Felson 1979; Messner & Tardiff 1985; Meithe, Stafford & Long 1987). The original perspective concerning victimization has been elaborated to explore if routine activities also alter one's ability to commit crimes and therefore explain not only victimization but also crime and delinquency (see Hawdon 1996, 1999; Osgood, Wilson, O'Malley, Bachman & Johnston 1996; Felson & Gottfredson 1984; Meithe & Meier 1994; Riley 1987). Hawdon (1996, 1999) argues that involvement can be re-conceptualized as *routine activity patterns*, or RAPs. The activities comprising a RAP vary in terms of their visibility and instrumentality. The higher the visibility and instrumentality of a set of activities, the more social control those engaging in such activities confront and, therefore, the lower the likelihood of delinquent behavior. Specifically, delinquents engage in a *recreational oriented RAP.* The re-conceptualization has been empirically supported in two separate analyses (Hawdon 1996, 1999).

Differential Association/Social Learning Theory and Subcultural Theories

Although there are differences among them (see Goode 1999), *differential association/social learning, subcultural* and *selective interaction theories* of drug use overlap. All of these perspectives emphasize the socialization process. In addition, they all maintain that crime is learned through intimate interactions. All of these perspectives underscore how associating with deviant peers increase the likelihood of crime, delinquency and drug use.

Sutherland's (1939) *differential association theory* has been one of the most prominent criminological theories ever professed and is the fundamental theory upon which other subcultural theories were developed. The central tenet of the theory is that individuals learn the specific motives, directions, techniques, and rationalizations for crime and deviance from intimate interactions. Through interactions with significant others, individuals are taught definitions of behavior that either favor the violation of law or favor conformity. The principle of differential association states that a person becomes delinquent because of an excess of definitions favorable to the violation of law over definitions unfavorable to the violation of the law (Sutherland 1939).

Akers (1977, 1992) and his associates (Akers, Krohn, Lanza-Kaduce, & Radosevich 1979) extend Sutherland's basic theory by adding principles of behavioral psychology to the theory to clarify the process by which individuals learn to deviate. As the basic principle of behavioral psychology asserts, behavior is modeled through the application of rewards and punishments. Certain groups, however, reward deviant behavior thereby teaching the individual that such behavior is "good" or "acceptable." Thus, drug use is a result of exposure to and participation in groups that use illicit drugs and define this behavior as "good." These groups provide

Table 1: Summary of Available Theoretic Variables

	Self-esteem	Problem Behavior Proness	Self Control	Bond	Routine Activity	Social Learning/ Subculture
Self-esteem	X	X				
Impulsive		X	X			
Risk Taker		X	X			
Commitment		X		X		
Attachment				X		
Recreational Pattern				X	X	X
Adult Supervision		X			X	
Peer Drug Use	X	X				X
Criminal Orientation				X (belief)		X
Criminal Behavior		X				X

> the environments in which exposure to definitions... and social reinforcements for use of or abstinence from any particular substance takes place. (Akers et al 1979 638)

While there are differences between the differential association / social learning theories, these theories overlap. Both perspectives emphasize the socialization process and that crime is learned through intimate interactions through a process of rewards and punishments. Subcultural theories further specify that the socialization into a drug-using lifestyle occurs in a stable peer group or a subculture and that this socialization process results in a transformation in the user's identity and normative belief system. Becker (1953) notes the specific factors–the techniques of use, the ability to recognize the effects of the drug, and the ability to define those effects as pleasurable–that are taught to individuals involved in the marijuana subculture. Yet, again, these factors are taught to the individual user by his or her intimate associates.

Others, most notably Johnson (1973), Kandel (1980; also see Kandel & Yamaguchi 1993, 1999, 2002) and Thornberry (1987, 1996; Thornberry, Lizotte, Krohn Farnworth & Jang 1991, 1994; Krohn, Lizotte, Thornberry, Smith & McDowall 1996), have elaborated the processes through which individuals become involved in deviant peer groups. Whether the process is due to alienation and isolation from the parental subculture (Johnson), the drifting into a delinquent peer group (Kandel), or a weakening of the social bond that ties youth to conformity (Thornberry) is undoubtedly important but beyond the scope of this paper. Similarly, whether users are forced into a drug using social network (Becker 1963) or seek them out (Kandel 1978) is beyond the scope of this paper. What is critical for our purpose is that these related theories note the importance of being socialized into drug use. Plus, this socialization process most frequently occurs in a peer group, and, once involved in a delinquent subculture, adolescents will likely engage in a range of deviant and criminal activities that reinforce their newly formed delinquent identity and belief system. Drug-using peers, therefore, increase the probability of use through their positive reactions to use.

The number of an adolescent's peers who use drugs is often used to measure the effects of differential association or subcultural involvement (Marcos et al 1986), and peer drug use has consistently been found to be a strong predictor of adolescent drug use (Akers et al 1979; Andrews, Tildesley, Hops & Li 2002; Ary, Tildesley, Hops & Andres 1993; Aseltine 1995; Bailey & Hubbard 1991; Elliot, Huizinga & Ageton 1985; Flay, Hu, Siddiqui, Day, Hedeker, Petraitis, Richardson & Sussman 1994; Hawdon 1996, 1999; LaGrange & White 1985; Marcos et al 1986). In addition, having a criminal orientation indicates involvement in a deviant subculture. This variable, in essence, is the converse of Hirschi's (1969) concept of *belief*. While Hirschi's *belief* is the extent to which individuals consider the law to be legitimate, a criminal orientation is the extent to which individuals consider violating the legal code as being acceptable. Finally, involvement in other criminal activities can serve as a proxy measure for the involvement in a delinquent peer

Table 2: Correlations

	Drug Use	Self-esteem	Impul-sive	Risk taker	Commit-ment	Attach-ment	Criminal orienta-tion	Recrea-tional RAP	Super-vision	Peer drug use	Criminal behavior	Age	Females
Drug use	1												
Self-esteem	**-.147**	1											
Impulsive	**.192**	**-.352**	1										
Risk taker	**.213**	-.080	**.242**	1									
Commitment	**-.142**	**.137**	**-.128**	**-.150**	1								
Attachment	**-.253**	**.311**	**-.170**	**-.181**	**.198**	1							
Criminal orientation	**.255**	**-.181**	**.221**	**.211**	**-.347**	**-.141**	1						
Recreational RAP	**.298**	-.016	**.233**	**.247**	**-.112**	**-.154**	**.189**	1					
Supervision	-.022	-.022	-.023	-.097	-.007	**-.117**	-.043	-.048	1				
Peer drug use	**.396**	**-.233**	**.205**	**.194**	**-.268**	**-.208**	**.400**	**.223**	-.043	1			
Criminal behavior	**.302**	**-.206**	**.265**	**.170**	**-.149**	**-.172**	**.212**	**.252**	.086	**.165**	1		
Age	**.233**	.017	.073	-.072	-.077	**-.120**	**.163**	**.218**	.083	**.334**	.432	1	
Female	.045	.034	**-.159**	-.108	.029	-.109	-.035	.083	.041	**.127**	-.164	.042	1
Minority	.096	-.037	**.124**	**.219**	**-.192**	.008	**.141**	.074	**-.150**	.058	-.012	**-.180**	**.239**

Bolded correlations are significant at the p<.05 or better.

group.

The above discussion does not pretend to exhaust the theories of drug use; however, it does cover many of the major perspectives. From this discussion, several concepts emerge as potential "causes" of adolescent drug use. These concepts include self-esteem, self-control, non-conventional beliefs and behaviors, the elements of the bond, routine activities, engaging in non-drug related criminal behaviors, and associating with delinquent peers. These theories and the variables they suggest are summarized in Table 1. Which set of concepts, the social-psychological or the social environmental, best predict adolescent drug use? Let us turn to an empirical test.

METHODS

A logistic regression analysis is used to determine which perspective best predicts adolescent drug use. The data were collected in 2000 from a middle school in South Carolina. The school is located in a small city of approximately 40,000 persons in the western part of the state. All enrolled students in the seventh and eighth grades were asked to complete a questionnaire. All those who did participate were entered into a raffle for $50 in gift certificates to a local music store. Of the 457 eligible students, 327 (70.2%) were granted permission by their legal guardian to participate in the survey and completed the questionnaire. Of the 321 complete questionnaires, 317 were usable. After listwise deletion of missing cases, the final analysis was conducted on 312 students.

Measures

The dependent variable for the analysis was measured using a single item. Respondents were asked if they had ever used a drug that was not prescribed to them by a doctor, such as marijuana or cocaine. Responses were coded as yes (1) or no (0). Thirty-five of the 312 respondents (11.2%) had used an illicit drug. This rate of use is slightly lower than the 13.6 percent reported by the National Household Survey on Drug Abuse (1999) for persons 13 years of age; however, the difference is not statistically significant ($t = 1.45$; $p = .148$) and well within the expected margin of error for this sample.

Several attitudinal variables were used in the analysis. *Self-esteem* was measured using an additive index of seven five-point Likert items derived from Rosenberg's self-esteem scale and frequently used to measure self-esteem. The seven items were: 1) I feel I do not have much to be proud of; 2) I feel I have a number of good qualities; 3) I feel I am as good as most others my age; 4) at times I think I am no good at all; 5) I can do things as well as most other people; 6) on the whole, I am satisfied with myself; and 7) I feel useless at times. Items (1), (4), and (7) were reversed coded so that higher scores reflect high self-esteem. The index had good internal reliability (alpha=.748). *Impulsiveness* was measured using a three-item index. The three items were: 1) when I get mad, I act before I think; 2) I lose my temper easily; and 3) sometimes the only way to solve a problem is to fight. The alpha coefficient for the index (.694) was somewhat low but acceptable. *Risk-taking behavior* was measured using a single five-point Likert item. Respondents were asked if they strongly agreed with, agreed with, had mixed feelings about, disagreed with, or strongly disagreed with the statement "I enjoy taking risks." *Commitment* was measured with the single item "how important to you is getting a good education." Responses on this item ranged from 1 (not at all important) to 5 (very important). *Attachment* was measured with the item "how would you describe your family life," which ranged from (1) "it is not good at all" to (5) "it is very good." Finally, *criminal orientation* was measured using a three-item index. The three five-point Likert items "you should obey the rules of adults," "sometimes it is alright to break the law," and "kids should respect their parents a lot." The first and third items were reverse coded so that high scores indicated a criminal orientation. The alpha for this item was .682.

In addition to the attitudinal items, several behavioral items were included in the analysis. Peer drug use was measured using the single item that asked how many of the respondent's friends used drugs like marijuana or cocaine. The responses for this item ranged from (1) "none" to (6) "almost all of them." Parental supervision was measured using the five-point Likert item "some adult is always watching me." Participation in a *recreational routine activity pattern* was measured with an additive index. The four items were: 1) "go out at night with your friends"; 2) "visit or hang out with friends"; 3) "ride in a car with friends for fun"; and 4) "go to movies

Table 3: Logistic Regression of Illicit Drug Use

	B	Standard Error	Exp(B)
Self-esteem	-.015	.051	.986
Impulsive	.068	.091	1.070
Risk taker	.337	.191	1.401
Commitment	.335	.444	1.398
Attachment	-.491*	.232	.612
Criminal Orientation	.069	.216	1.072
Peer Drug Use	.491**	.177	1.633
Recreational pattern	.167	.075	1.182
Adult Supervision	-.060	.185	.941
Criminal Behavior	.506*	.205	1.659
Female	-.400	.566	.670
Ethnic Minority	-.549	.522	.578
Age	.601*	.268	1.823
Constant	-6.765*	3.066	.001

*p<.05; **p<.01

Model $x^2 = 83.676$; $p<.001$

Hosmer and Lemeshow Goodnes of fit $x^2 = 8.300$; $p = .405$

Nagelkerke $R^2 = .463$

with friends." Each of these items ranged from (1) "never" to (5) "almost every day." The alpha coefficient for this item was .735. Finally, a summative index was used to measure *involvement in non-drug related crimes*. Respondents were asked to indicate if they had: 1) avoided paying for things like movies, bus rides, or food; 2) broke into a building to look for something to steal or to steal something; 3) used a weapon, like a club, knife or gun, in a fight; 4) hit someone with their fists; 5) stole or tried to steal a motor vehicle; 6) hit or struck one of their parents; 7) used a knife or gun or club to get something from a person; 8) ran away from home; 9) hurt someone badly enough so they needed a doctor; 10) damaged property on purpose; 11) stole something worth less than $50; and 12) stole something worth more than $50. Each of these items was coded as "0" if the respondent had not engaged in the behavior and "1" if they had. The final variable was re-coded to range from "0" (had committed no crime) to "4" (committed four or more crimes) because the data were extremely skewed and only 6 students claimed to have committed more than four crimes.

To control for various demographic factors that have been found to be related to adolescent drug use, the respondent's age, gender, and ethnic status were entered into the equation. The ages of the respondents ranged from 12 to 15 (one respondent was 16 years old and one was 17. These respondents were re-coded to "15 and older" category). Gender and ethnic status were coded as dummy variables. Females (coded as 1) comprised 33.7 percent of the sample. Ethnic status was coded as a "1" for African-Americans, Hispanic, and Asian and as "0" for Anglos. Approximately fifty-four percent of the surveyed youths were ethnic minorities. Although the sample over-represents males relative to the school's population, it accurately reflects the school's ethnic composition. The univariate statistics for all variables are presented in the Appendix.

RESULTS

The bi-variate correlations between illicit drug use and the attitudinal and behavioral measures are presented in Table 2. Referring to Table 2, it can be seen that the variables are correlated with illicit drug use in the predicted direction. All of the correlations between drug use and the theoretically interesting variables are significant at conventional levels except the correlation between illicit drug use and adult supervision. It should be noted that this variable measures *perceptions of supervision* and not the actual amount of time the respondent is supervised by an adult. Age is the only demographic variable that is significantly correlated with illicit drug use.

Similar to other research findings, the

number of peers who use drugs had the strongest correlation with illicit drug use (r = .396; $p<.001$). Participation in non-drug related criminal activity had the next strongest bi-variate correlation (r =.336; $p<.001$). Participation in a recreational routine activity pattern was also positively correlated with illicit drug use (r =.301; $p<.001$). Attachment produced the strongest correlation among the attitudinal variables (-.253; $p<.001$). As predicted, being a risk-taker, being impulsive and having a criminally oriented belief system were positively correlated with illicit drug use (r =.213, .176, and .231, respectively). Commitment and self-esteem were inversely related to drug use.

Moving from a bi-variate to a multivariate analysis, a logistic regression model was used to predict illicit drug use. The model was statistically significant ($X^2_{df(13)}$ =87.15; $p<.001$), indicating that the model produced a significant improvement over a model containing only the constant. The model fit the data well (Hosmer and Lemeshow Goodness of Fit $X^2_{df(8)}$ =5.16; p=.741) and explained 48.3 percent of the variance in illicit drug use. Overall, 92.3 percent of the cases were correctly classified by the model. The results of this analysis are presented in Table 3.

As reported in Table 3, only five of the thirteen predictor variables were statistically significant at conventional levels. Involvement in non-drug related criminal activity significantly increased the likelihood of using illicit drugs. Those involved in criminal behaviors were nearly twice as likely to use illicit drugs than those who were not criminal (exp B = 1.920). Having drug-using peers increases the odds of using by 74 percent (exp B = 1.735). Participating in a recreational RAP also increased the likelihood of using illicit drugs. Increasing one's involvement in this activity pattern by one unit increased the odds of using illicit drugs by 20 percent (exp B = 1.203). Among the attitudinal variables, attachment was a significant predictor of illicit drug use, and being a risk taker significantly predicted drug use if a one-tailed test of significance is used ($p_{one\text{-}tail}$ =.044). Being attached to one's family decreased the odds of using drugs by 40 percent (exp B=.598). Being a risk-taker increased the odds of using illicit drugs by 41 percent (exp B=1.411). The only demographic variable that achieved statistical significance was age. Not surprisingly given the ages of the respondents in the analysis, each year increased the odds of using illicit drugs by 80 percent (exp B = 1.805). Self-esteem, impulsiveness, commitment, having a criminally-oriented belief system, and adult supervision failed to achieve statistical significance in the model. Similarly, there were no significant differences between males and females or between ethnic minorities and non-minorities.

DISCUSSION

Based on these results, both attitudinal and behavioral variables can significantly predict adolescent drug use. However, generally speaking, the behavioral variables seem to be better at predicted drug use than the attitudinal variables. Among the attitudinal variables, only attachment–a variable introduced to the literature through a "social" theory–was statistically significant at conventional levels. Risk taking was significant using a one-tailed test of significance. Conversely, three of the behavioral variables significantly predicted illicit drug use. Being involved in a delinquent subculture, as measured through peer drug use and involvement in non-drug related criminal activities, were both significant predictors of drug use. These results are not surprising. Research has consistently found that associating with drug-using peers is one of the best predictors of adolescent drug use (Elliot et al 1985; Hawdon 1996; Marcos et al 1986), and drug use and non-drug related crime are highly correlated. Similarly, being involved in a recreational routine activity pattern also significantly increased the likelihood of using illicit drugs. This variable can also be seen as an indication of involvement in a delinquent subculture.

As far as the theories reviewed in this paper are concerned, at least given the operationalization of the relevant concepts of each, the social theories receive the most support. Specifically, the differential association/social learning/subculture theory received substantial empirical support. The routine activity perspective also received support. Involvement in a recreational *activity pattern*, not simply specific activities analyzed separately, can significantly predict delinquent behavior. Hirschi's bond theory received relatively more support than his self-control theory. While attachment and the reconceptualized measure of involvement were significant predictors of use, only one of the

"many manifestations" of self-control (risk-taking) approached statistical significance. Jessor's eclectic theory, or at least the behavioral aspect of the theory, also receives support.

These results should not be interpreted to mean that the attitudinal variables are ultimately unimportant. This analysis, like most others, was conducted on cross-sectional data. With respect to the "true" etiology of drug use, the attitudinal variables may be extremely important. It is likely, for example, that more impulsive youths or risk-takers are much more likely to become involved in a delinquent subculture than youth with higher levels of self-control. It is also quite possible that the self-esteem model is accurate. That is, low levels of self-esteem may lead to compensatory behaviors that include associating with delinquents who reward the behaviors that their parents and conforming peers reject. With respect to the entire process of becoming a drug user, attitudinal variables are likely the "distal causes" of the phenomena. Nevertheless, behavioral variables appear to be the more "proximate causes" of adolescent drug use and the better predictors of use in a cross-sectional analysis.

This research certainly has limitations that should be consider. First, it is based on cross-sectional data and therefore cannot test *the process* of becoming a drug user. Such tests conducted on longitudinal data could verify that attitudinal variables *lead to* the behavioral variables that were found to be good predictors of use in this research. Indeed, several of the social-psychological theories predict just that. Assuming the behavioral variables are indeed intervening variables in the causal process between attitudinal variables and drug use, one would expect that these variables would no longer be correlated with drug use once the intervening variables are entered into the model. Therefore, this analysis does not critically test these theories. Instead, it implies that the behavioral variables must be included in any process model of becoming a drug user.

Next, the operationalizations of some concepts is less than perfect. Most notably, a good measure of parental supervision was unavailable in the data. Instead, the respondent's perception of supervision was used as a proxy measure. This variable failed to be a significant predictor of drug use (indeed, it was not even correlated with drug use at the bi-variate level). It is possible that those who wish to deviate perceive that they are under intense supervision even if they are not. Conversely, conforming youth may not perceive the actual amount of supervision they are under because they do not wish to engage in deviant acts and therefore do not need to avoid the watchful eyes of their parents or teachers. A measure of the actual amount of time the youth spends being supervised could improve the model significantly. Despite these limitations, the findings are consistent with other research efforts.

IMPLICATIONS

The above limitations not withstanding, this research has theoretical and practical implications. First, theories that fail to include behavioral concepts are unlikely to be very successful in explaining variations in adolescent drug use. Although attitudinal variables are important, more dynamic models are needed to adequately explain delinquent behavior (see Mason & Windle 2002). Empirical tests, including the one conducted here, consistently find that behavioral variables are critically important. Thus, social-psychological theories, such as Kaplan's and the Jessors', that link attitudinal variables with behavioral variables may prove most fruitful. Moreover, it appears that more than one psychological process is involved in generating the motives for associating with deviant peers and becoming involved in a delinquent subculture. Although risk-taking and impulsiveness are correlated with the behavioral measures as Gottfredson and Hirschi would predict, self-esteem, commitment, and attachment are also correlated with the behavioral variables.

Again it is emphasized that this argument is not meant to imply that social-psychological or attitudinal variables are unimportant. Instead, it is meant to re-emphasize the importance of social variables. One simply cannot understand deviance in general and drug use specifically without understanding the setting in which it occurs. We must understand that the use of intoxicating drugs is often about conforming, not deviating. Indeed, cross-culturally and historically speaking, drug use is often not deviant behavior. The use of peyote during the ritual celebrations of the *Native American Church* is not deviant (French 2000). Nor is the use of the hallucinogen *paricá* by the Desana of Brazil

and Columbia (Buchillet 1992). Similarly, Christians who consume wine during Holy Communion are not deviants. Of course, these uses of drugs are not what people generally have in mind when they talk about drug use or drug abuse. Yet even the recreational use of intoxicants among adolescents can be "normal," or non-deviant. The use of *qat* to stimulate discussion at a party is not deviant in Yemeni culture (see Weir 1985). The vast majority of adult Americans have legally used alcohol to recreate. Even the use of illegal drugs for recreation includes elements of conforming behavior. The use of marijuana by American teens, for example, is often as much of a result of *conforming* to subcultural norms as it is about *deviating* from the dominant culture's norms. In many western cultures, adolescent drug use, according to some, has become normalized (see, for example, Parker, Aldridge & Measham 1998). Failing to understand the social context of recreational drug use directs us down the wrong path. We must understand that adolescent drug use is as much about conforming to sub-group norms as it is about deviating from social norms.

The recognition of the importance of setting for understanding adolescent drug use recalls Talcott Parson's basic insight that action is directed and governed by norms (see Parsons & Shils 1951). Understanding where these norms originate and how they are maintained is critical to understanding behavior. With respect to the illicit use of drugs by adolescents, this analytic strategy would lead to trying to better understand the norms of the drug subculture. Understanding how these groups have evolved and why they are so attractive to so many youth could offer great insights to how better address the nation's drug problem.

The recognition of how important the setting of drug use is to understanding it also has practical implications. If we are to successfully deter adolescents from using drugs or rehabilitate those who already do, we would be wise to focus our attention on the social setting of recreational drug use. We could possibly manipulate the leisure activities of our youth by providing more visible and instrumental activities, by structuring these activities in ways that make them more attractive to drug-using youth, and by fostering friendship networks with non-delinquent peers. This strategy may be easier to accomplish than trying to undue fifteen years of poor socialization.

REFERENCES

Agnew RS. 1985. Social control theory and delinquency: a longitudinal test. *Criminology* 23 1 47-61.

Akers RL. 1977. *Deviant Behavior: A Social Learning Perspective*. Belmont: Wadsworth.

_____. 1992. *Drugs, Alcohol and Society*. Belmont: Wadsworth.

Akers RL, MD Krohn, L Lanza-Kaduce, & M Radosevich. 1979. Social learning and deviant behavior: a specific test of a general theory. *Amer Sociol Rev* 44 636-655.

Andrews JA, E Tildesley, H Hops & F Li. 2002. The influence of peers on young adult substance use. *Health Psychology* 21 349-357.

Arneklev BJ, HG Grasmick & RJ Bursik Jr. 1999. Evaluating the dimensionality and invariance of 'low self-control'. *J Quantitative Criminology* 15 307-331.

Ary DV, E Tildesley, H Hops & J Andres. 1993. The influence of parent, sibling, and peer modeling and attitudes on adolescent use of alcohol. *International J Addictions* 28 853-880.

Aseltine RH. 1995. A reconsideration of parental and peer influence on adolescent deviance. *J Health Social Behavior* 36 103-122.

Bailey SL & RL Hubbard. 1991. Developmental changes in peer factors and the influence on marijuana initiation among secondary school students. *J Youth Adolescents* 20 339-360.

Becker H. 1953. Becoming a marihuana user. *Amer J Sociol* 59 235-242.

_____. 1963. *The Outsiders: Studies in the Sociology of Deviance*. NY: Free Press.

Buchillet D. 1992. Nobody is there to hear: desana therapeutic incantations. Pp. 211 - 230 in EJM Langdon & G Baer eds *Portals of Power: Shaminism in South America*. Albuquerque, NM: U New Mexico Press.

Cohen LE & M Felson. 1979. Social change and crime rate trends: a routine activities approach. *Amer Sociol Rev* 44 588-608.

Donovan JE. 1996. Problem-behavior theory and the explanation of adolescent marijuana use. *J Drug Issues* 26 2 379-404.

Donovan JE, R Jessor & FM Costa. 1991. Adolescent health behavior and conventionality-unconventionality: an extension of problem-behavior theory. *Health Psychology* 10 1 52-61.

_____. 1993. Structure of health-enhancing behavior in adolescence: a latent-variable approach. *J Health Social Behavior* 34 4 346-362.

Elliott DS, D Huizinga & SS Ageton. 1985. *Explaining Delinquency and Drug Use*. Beverly Hills: Sage.

Felson M & M Gottfredson. 1984. Social indicators of adolescent activities near peers and parents. *J Marriage Family* 46 709-714.

Flay BR, FB Hu, O Siddiqui, LE Day, D Hedeker, J Petraitis, J Richardson, & S Sussman. 1994. Differential influence and escalation of smoking. *J Health Social Behavior* 35 248-265.

French LA. 2000. *Addictions and Native Americans*. Westport, CT: Praeger.

Goode E. 1999. *Drugs in American Society*, 5th edition. NY: McGraw-Hill College.

Gottfredson MR & T Hirschi. 1990. *A General Theory of Crime*. Stanford, CA: Stanford U Press.

Hawdon JE. 1996. Deviant lifestyles: the social control of daily routines. *Youth Society* 28 162-188.

_____. 1999. Daily routines and crime: using routine activities as measures of Hirschi's involvement. *Youth Society* 30 395-415.

Hirschi T. 1969. *Causes of Delinquency*. Berkeley: U California Press.

Hope TL & KR Damphousse. 2002. Applying self-control theory to gang membership in a non-urban setting. *J Gang Research* 9 41-61.

Jang SJ & TP Thornberry. 1998. Self-esteem, delinquent peers, and delinquency: a test of the self-enhancement thesis. *Amer Sociol Rev* 63 586-598.

Jessor R. 1979. Marihuana: a review of recent psychological research. Pp. 337-355 in RI Dupont ed. *Handbook on Drug Abuse*. Washington, DC: USGPO.

_____. 1987. Problem-behavior theory, psychosocial development and adolescent problem drinking. *British J Addiction* 82 331-342.

Jessor R, JA Chase & JE Donovan. 1980. Psychosocial correlates of marijuana use and problem drinking in a national sample of adolescents. *Amer J Public Health* 70 6 604-613.

Jessor R, JE Donovan & FM Coasta. 1991. *Beyond Adolescence: Problem Behavior and Young Adult Development*. NY: Cambridge U Press.

Jessor R & SL Jessor. 1977. *Problem Behavior and Psychosocial Development: A Longitudinal Study of Youth*. NY: Academic Press.

_____. 1980. A social-psychological framework for studying drug use. Pp 54-71 in DJ Lettieri ed *Theories on Drug Abuse*. Rockville, MD: National Institute on Drug Abuse.

Johnson BD. 1973. *Marihuana Users and Drug Subcultures*. NY: Wiley-Interscience.

Kandel DB. 1978. ed. *Longitudinal Research on Drug Use: Empirical Findings and Methodological Issues*. Washington, DC: Hemisphere Publishing Corporation.

_____. 1980. Developmental stages in adolescent drug involvement. Pp. 120-127 in DJ Lettieri ed. *Theories on Drug Abuse*. Rockville, MD: National Institute on Drug Abuse.

Kandel DB & K Yamaguchi. 1993. From beer to crack: developmental patterns of involvement in drugs. *Amer J Public Health* 83 851-855.

_____. 1999. Developmental stages of involvement in substance use. Pp. 50-74 in RE Tarter, RJ Ammerman, & PJ Ott eds *Sourcebook on Substance Abuse: Etiology, Assessment and Treatment*. NY: Allyn and Bacon.

_____. 2002. Stages of drug involvement in the US population. Pp. 65-89 in DB Kandel ed *Stages and Pathways of Drug Involvement: Examining the Gateway Hypothesis*. NY: Cambridge U Press.

Kaplan HB. 1975. *Self-Attitudes and Deviant Behavior*. Pacific Palisades, CA: Goodyear.

Kaplan HB & H Fukurai. 1992. Negative social sanctions, self rejection, and drug use. *Youth Society* 23 275-298.

Kaplan HB & RJ Johnson. 1991. Negative social sanctions and juvenile delinquency: effects of labeling in a model of deviant behavior. *Social Science Quarterly* 72 98-122.

Kaplan HB, RJ Johnson, & CA Bailey. 1986. Self-rejection and the explanation of deviance: refinement and elaboration of a latent structure. *Social Psychology Quarterly* 49 110-128.

_____. 1987. Deviant peers and deviant behavior: further elaboration of a model. *Social Psychology Quarterly* 50 277-284.

Kempf KL. 1993. The empirical status of Hirschi's control theory. Pp. 143-185 in F Adler & WS Laufer eds *New Directions in Criminological Theory*. New Brunswick, NJ: Transaction.

Krohn MD, AJ Lizotte, TP Thornberry, C Smith, & D McDowall. 1996. Reciprocal causal relationships among drug use, peers, and beliefs. *J Drug Issues* 26 2 405-428.

LaGrange RL & HR White. 1985. Age differences in delinquency: a test of theory. *Criminology* 23 19-43.

Leeman RF & S Wapner. 2001. Some factors involved in alcohol consumption of first-year undergraduates. *J Drug Education* 31 249-262.

Marcos AC, SJ Bahr & RE Johnson. 1986. Test of a bonding/association theory of adolescent drug use. *Social Forces* 65 135-161.

Mason WA & M Windle. 2002. Gender, self-control, and informal social control in adolescence: a test of three models of the continuity of delinquent behavior. *Youth Society* 33 479-514.

Messner SF & K Tardiff. 1985. The social ecology of urban homicide: an application of the routine activities approach. *Criminology* 23 241-267.

Miethe TD & RF Meier. 1994. *Crime and its Social Context: Toward an Integrated Theory of Offenders, Victims and Situations*. Albany: SUNY Press.

Miethe TD, M Stafford & JS Long. 1987. Social differentiation in criminal victimization: a test of routine activities/lifestyles theories. *Amer Sociol Rev* 52 184-194.

Miller MA, JK Alberts, ML Hecht, MR Trost, & RL Krizek. 2000. *Adolescent Relationships and Drug Use*. Mahwah, NJ: Lawrence Erlbaum Associates.

Osgood DW, JK Wilson, PM O'Malley, JG Bachman & LD Johnston. 1996. Routine activities and

individual deviant behavior. *Amer Sociol Rev* 61 635-655.
Parker H, J Aldridge & F Measham. 1998. *Illegal Leisure: The Normalization of Adolescent Recreational Drug Use*. London: Routledge.
Parsons T & EA Shils. 1951. *Toward a General Theory of Action*. Cambridge: Harvard U Press.
Riley D. 1987. Time and crime: the link between teenager lifestyle and delinquency. *J Quantitative Criminology* 3 339-354.
Sutherland E. 1939. *Principles of Criminology*. Philadelphia: Lippincott.
Thornberry TP. 1987. Toward an interactional theory of delinquency. *Criminology*. 25 863-891.
_____. 1996. Empirical support for interactional theory: a review of the literature. Pp. 198-235 in JD Hawkins ed *Delinquency and Crime: Current Theories*. NY: Cambridge U Press.
Thornberry TP, AJ Lizotte, MD Krohn, M Farnworth, & SJ Jang. 1991. Testing interactional theory: an examination of reciprocal casual relationships among family, school, and delinquency. *J Criminal Law Criminology*. 82 3-35.
_____. 1994. Delinquent peers, beliefs, and delinquent behavior: a longitudinal test of interactional theory. *Criminology*. 32 47-83.
Turner M & AR Piquero. 2002. The stability of self-control. *J Criminal Justice*. 30 457-472.
Vazsonyi AT, LE Pickering, M Junger, & D Hessing. 2001. An empirical test of a general theory of crime: a four-nation comparative study of self-control and prediction of deviance. *J Res Crime and Delinquency* 38 91-131.
Vega WA & AG Gil. 1998. *Drug Use and Ethnicity in Early Adolescence*. NY: Plenum.
Vega WA, E Apospori, AG Gil, RS Zimmerman, & GJ Warheit. 1996. A replication and elaboration of the esteem-enhancement model. *Psychiatry* 59 128-144.
Wang GT, H Qiao, S Hong, & J Zhang. 2002. Adolescent social bond, self-control and deviant behavior in China. *International J Contemporary Sociology*. 39 1 52-68.
Weir S. 1985. *Qat in Yemen: Consumption and Social Change*. London: The British Museum Publications Limited.
Wurmser L. 1980. Drug use as a protective system. Pp. 71-74 in DJ Lettieri ed *Theories of Drug Abuse*. Rockville, MD: National Institute on Drug Abuse.

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Appendix

Descriptive Statistics

	Minimum	Maximum	Mean	Std. Deviation
Drug use	.00	1.0	.110	.313
Self-esteem	13.0	36.0	27.59	4.80
Impulsive	3.0	15.0	8.07	2.74
Risk taker	1.0	5.0	2.93	1.32
Commitment	2.0	5.0	4.84	0.44
Attachment	1.0	5.0	4.12	0.94
Peer drug use	1.0	5.0	1.71	1.22
Recreational RAP	4.0	20.0	12.07	3.71
Adult supervision	1.0	5.0	3.47	1.16
Criminal orientation	1.0	5.0	1.63	1.02
Criminal behavior	0.0	4.0	0.79	0.98
Age	12.0	15.0	13.86	0.81
Female (1)	.00	1.0	.347	0.48
Minority (1)	.00	1.0	.536	0.50