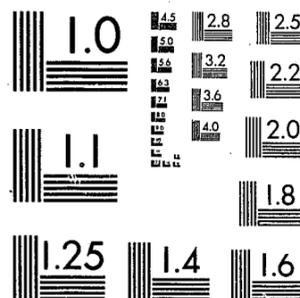


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RESEARCH ANALYSIS
and
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Drug Abuse
and the
American
Adolescent

82180

DEPARTMENT OF HEALTH AND HUMAN SERVICES
Alcohol, Drug Abuse, and Mental Health Administration

✓
**Drug Abuse and the
American Adolescent**

Editors:

Dan J. Lettieri, Ph.D.
Jacqueline P. Ludford, M.S.
National Institute on Drug Abuse

NIDA Research Monograph 38
A RAUS Review Report

DEPARTMENT OF HEALTH AND HUMAN SERVICES
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The Delinquency and Drug Use Relationship Among Adolescents: A Critical Review

Richard R. Clayton, Ph.D.

The primary purpose of this paper is to review what is now known about the delinquency-drug use relationship among adolescents. A related task is to use the review to target aspects of the delinquency-drug use relationship that require further research scrutiny and more elaboration.

Most of the research on the crime-drug nexus has dealt with drug use among criminal offenders (cf., Barton 1976; Eckerman et al. 1971; Kozel et al. 1972; Weissman et al. 1974) and criminality among narcotics addicts (cf., Inciardi and Chambers 1972; Voss and Stephens 1973; Ball et al. 1975; Nurco and DuPont 1977; Inciardi 1979). In the recent past a number of reviews of the crime-drug relationship have been published, usually with a special emphasis on narcotics use (Chambers 1974; Cushman 1974; Gould 1974; Greenberg and Adler 1974; Research Triangle Institute 1976; Weissman 1979; Gandossy et al. 1980).

The story with regard to the delinquency-drug use relationship among adolescents is different. While there are a multitude of studies that examine the etiology of adolescent drug use or juvenile delinquency and some that focus on both drug use and delinquency as separate indices of deviance, there are relatively few studies that attempt to understand how delinquency and drug use are related to each other. However, these latter studies have been thoroughly reviewed by Elliott and Ageton (1976b). They divided the extant literature into "studies of officially defined drug users and delinquents" (Chein 1964; Chein et al. 1964; Weitzner et al. 1973; Friedman and Friedman 1973a) and "studies involving normal youth populations" (Robins and Murphy 1967; Jacoby et al. 1973; Friedman and Friedman 1973b; Goode 1973; Johnston 1973; O'Donnell et al. 1976; Jessor and Finney 1973; Jessor 1976; Gold and Reimer 1974; Elliott and Ageton 1976a; Hindelang and Weiss 1972).

It would be redundant to review in detail each of the studies reviewed by Elliott and Ageton (1976b). Therefore, in the remainder of this paper findings and conclusions from the studies reviewed by Elliott and Ageton will be used only to highlight the points being made.

Before the substantive findings and conclusions are reviewed, it would be useful to delineate the methodological and scientific bases from which the delinquency-drug use relationship should be examined. In

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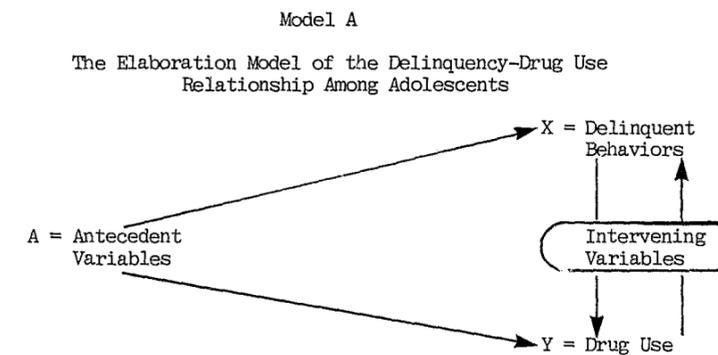
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the next section a model of the relationship is presented along with a discussion of the criteria of causality that should be applied to this relationship.

THE DELINQUENCY-DRUG USE RELATIONSHIP: A METHODOLOGICAL MODEL

The methodological model that is most appropriate for examining the delinquency-drug use relationship (Clayton and Tuchfeld, unpublished) is based on the multivariate "elaboration" approach of Lazarsfeld (1955), Hyman (1955), and Rosenberg (1968) at the nonparametric level and the causal modeling approach of Blalock (1971), Heise (1975), Joreskog (1970), and Duncan (1975) at the parametric level.



Source: Clayton, R.R., and Tuchfeld, B.S. The drug-crime debate: Obstacles to understanding the relationship. Unpublished.

This model is based on the probabilistic concept and criteria of causality accepted by virtually all social scientists. Hirschi and Selvin (1967) identified the three essential criteria of causality as follows:

- The predictor and effect variables must be correlated (i.e., statistical association).
- The predictor variable must be antecedent to the effect variable in time-order occurrence. Because social scientists usually aggregate data for individuals according to group characteristics (e.g., gender, ethnicity, etc.), the predictor variable must be antecedent to the effect variable in the "majority" of cases, not necessarily in all cases.

- It must be demonstrated that the observed statistical correlation between the predictor and effect variables does not result from both being "caused" by variables antecedent to both (i.e., the zero-order relationship must be tested for "spuriousness" by partialing out the influence of antecedent variables).

Model A has several component parts that deserve attention. First, there are two-headed arrows between delinquency and drug use. This implies that (a) drug use could be antecedent to and predictive of delinquency and (b) delinquency could be antecedent to and predictive of drug use. In either case, the first order of research business is to establish the degree of association between the two variables.

Second, the two-headed arrows imply that one must establish the predominant temporal order among drug-using and delinquency behaviors. There are several meanings of temporal order found in the literature on the delinquency-drug use relationship. The most common meaning focuses on "onset." Does age at first delinquent act predate age at first drug use, or vice versa? The answer to this question usually hinges on whether the researcher is interested only in illicit drug use, in which case delinquency is usually the predictor and illicit drug use the effect variable. If the researcher has data on first use of alcohol or cigarettes or first experience with alcohol intoxication, in addition to onset of use of illicit drugs, the temporal sequence might be: first use of licit drugs to first delinquent act to first use of illicit drugs. A second and less common meaning of temporal order involves charting the dynamic intersection of drug-using and delinquent behaviors over time. For example, the research question using this meaning of temporal order is: Among persons who have already engaged in delinquent acts, does initiation of drug use increase the frequency, seriousness, and variety of delinquent activities, and does this lead to greater drug involvement, and so on? While both meanings of temporal sequencing are relevant to the delinquency-drug relationship, design and other considerations have led most researchers to use the first meaning, onset events by onset events.

Determining whether a relationship is spurious is the most difficult criterion of causality to establish beyond reasonable doubt. It is also the criterion that is least understood. In model A the delinquency-drug use relationship is tested for spuriousness by controlling on or partialing out the effects of variables that are antecedent to and possibly causal of both drug use and delinquency. This requires that (a) one provide evidence that these variables are, in fact, antecedent to both X and Y, and (b) that the partial correlation coefficients (XY: $a_1, a_2, a_3 \dots a_n$) reduce to zero or become statistically nonsignificant.

The last component of model A that should be discussed is located in the oval sphere between delinquency and drug use. These are variables that intervene temporally and/or theoretically between X and Y. A statistical control on the intervening variable(s) should produce a zero or statistically nonsignificant partial correlation coefficient. If this occurs it does not mean that X is not a cause of Y. Instead,

it means that the influence of X on Y is indirect, not direct, and that knowledge of the variables intervening between X and Y enhances understanding of the XY relationship. Stated differently, evidence of intervening variables elaborates understanding of the XY causal chain.

There is a great deal of variation in the methodological rigor among the studies that have dealt with the delinquency-drug use relationship. Predictably, on that score, more confidence can be placed in the findings from studies conducted in the recent as opposed to distant past. Findings from studies that are based on normal populations will likewise be more credible than those conducted on officially identified delinquents or drug users.

DELINQUENCY AND DRUG USE AMONG ADOLESCENTS: ARE THEY CORRELATED?

The first criterion of causality concerns the presence of a relationship: Are delinquency and drug use correlated? In a general way, Jessor's observation about marijuana provides an answer to this question. "The most ubiquitous generalization that can be made is that marijuana use, far from being an isolated behavior, is generally part of a larger behavioral pattern involving the use of other drugs and engaging in a variety of other unconventional or nonconforming actions such as delinquency, sexual experience, political activism, and attenuated academic performance" (Jessor 1979, p. 346). At a more specific level, Elliott and Ageton (1976b) found some association between delinquency and drug use in every study they reviewed. The only exception to this was a study by Scott and Wilcox (1965) that focused exclusively on amphetamines. Overall, the delinquency-drug use relationship is general and seems to hold for both serious and nonserious delinquency.

DELINQUENCY AND DRUG USE AMONG ADOLESCENTS: WHAT IS THE PREDOMINANT TEMPORAL ORDER?

In the broader literature on the crime-drug nexus there is consensus on the question of temporal order. Most studies of opiate addicts reveal that criminal involvement precedes use of narcotics and addiction (cf., Winick 1974; Lukoff 1974; McGlothlin et al. 1978; Nurco and DuPont 1977). The only recent study of addicts that found minimal criminal activity prior to first use of narcotics was conducted among residents at the Lexington Hospital by Voss and Stephens (1973).

Inciardi's (1979) study of apprehended and unapprehended criminals in a sample of 356 active heroin users from Miami shows that onset of delinquency precedes use of illicit drugs, including marijuana. Data on the median ages of initiation into various stages of drug/crime careers for this sample are found in table 1.

Table 1

Drug/Crime Careers: Median Age at Initiation for a Sample of Active Heroin Addicts (Inciardi 1979)

Drug/Crime Events	Median Age of Initiation	
	Males	Females
First alcohol use	12.8	13.8
First alcohol intoxication	13.3	13.9
First criminal activity	15.1	15.9
First drug abuse	15.2	15.2
First marijuana use	15.5	15.4
First arrest	17.2	18.3
First barbiturate use	17.5	17.0
First heroin use	18.7	18.2
First continuous heroin use	19.2	18.4

Adapted from Inciardi, J.A. Heroin use and street crime. *Crime and Delinquency*, 25:335-346, 1979.

While delinquency precedes illicit drug use, use of alcohol and first alcohol intoxication are clearly antecedent to delinquency. In fact, there is a 2-year average hiatus between first alcohol intoxication and first criminal activity for both males and females who later become heroin addicts. It is probably safe to assume that alcohol intoxication episodes occurred with some frequency for these individuals prior to commission of their first criminal act. Another safe assumption is that these alcohol intoxication episodes usually occur as group events, suggesting that (a) it is important to consider alcohol use in any examination of the delinquency-drug use relationship and (b) alcohol may be a key factor in the movement of youth from the influences of family for conventionality toward the influences of peers for unconventional conduct.

In his review of the etiological aspects of drug abuse, Nurco underscored the important role of alcohol in transition proneness:

...addicts appear to begin drinking before their age and social class peers in the general population--that is, addicts might be called "norm breakers." Not only do they appear to be more deviant than the general population, but they prove this by engaging in the "marginally acceptable" before others do. (Nurco 1979, p. 315)

Elliott and Ageton (1976b) reach the following conclusion about temporal order:

There is considerable consensus that involvement in delinquent behavior precedes any use of illicit drugs. This generalization clearly does not apply to alcohol use but does apply to the total range of illicit drugs investigated.... There is consistent, compelling evidence that delinquency precedes illicit drug use.

THE DELINQUENCY-DRUG USE RELATIONSHIP: IS IT SPURIOUS?

There is also a consensus that the delinquency-drug relationship among adolescents is spurious; that is, the observed correlation between these two variables washes out when variables antecedent to and causally related to both delinquency and drug use are statistically controlled.

Goode (1973), in a study conducted for the Marijuana Commission, said that his findings strongly support the view that marijuana use by itself is not related in any meaningful way to criminal behavior. He claims that the spurious model seems to be a far more accurate description of the relationship between marijuana use and criminal behavior than the causal model.

Elliott and Ageton (1976a) reached the same conclusion in a cross-sectional survey of probability samples of over 8,000 youths 11 to 17 years old drawn from 7 cities. They compared their findings from this study of "normal" youths with those obtained when only those youths reporting substantial involvement in delinquency were examined (n = 1,920). Summarizing the findings in their review article, Elliott and Ageton (1976b) say:

The results of this study which involved surveys of large normal youth populations suggest that the association between marijuana use and income-producing or violent crimes is spurious and that marijuana use is normative for youth involved in any significant amount of delinquency. The same finding was observed for alcohol use. At the same time, these results suggest that the use of hard drugs and the sale of marijuana or hard drugs is associated with both income-producing and violent crimes, and that this relationship is not explained by one's general involvement in delinquency.

Johnston et al. (1978) used a national probability sample of young men studied at five points in time to examine the delinquency-drug use relationship. While the ages covered were 15 to 23, items concerned with initial age at onset of drug use did not appear in the schedule until the fourth data collection. At this time, most of the respondents had been out of high school for a year. At this point, they were asked to recall their drug use during the year prior to graduation, when they were 17 to 18 years old, and for the year after graduation when they were 18 to 19 years old. Similar data on drug use were obtained when the respondents were 19 to 22 years old

(fifth wave) and for the year immediately prior to the fifth point of data. Elliott and Ageton (1976b) note: "It should be remembered, however, that by the time the initial drug measures were obtained, the cohort was approximately 19, recalling drug use 2 years earlier when they were 17. The initial onset of drug use was probably missed for a large proportion of sample subjects."

Johnston et al. (1978) used a composite measure of drug use involving marijuana, other drug use (not including heroin), and heroin use, with both a frequency and a seriousness dimension. Measures of delinquency were gathered in all five waves yielding two indices: a Theft and Vandalism Index (e.g., items on arson, car theft, theft of an expensive car part, school vandalism, theft of an inexpensive car part, theft of objects worth over \$50, trespassing, shoplifting, and theft of objects worth under \$50); and an Index of Interpersonal Aggression (e.g., hit an instructor or supervisor, armed extortion, injurious assault, gang fight, and fight at school or work).

Their conclusions relate specifically to the question of whether the delinquency-drug use relationship is spurious. The finding from this study is especially important because the sample is from a normal population, it is representative of a nationwide cohort, and the data are from a longitudinal study of the same subjects.

Johnston et al. (1978) state:

What we do conclude from these explorations is that nonaddictive use of illicit drugs does not seem to play much of a role in leading users to become the more delinquent people we know them to be on the average. The reverse kind of causation seems considerably more plausible, that is, that delinquency leads to drug use. For example, we think it quite possible that delinquents who, because of their delinquency, become part of a deviant peer group are more likely to become drug users because drug use is likely to be an approved behavior in such a peer group. We also suspect that the correlation between delinquency and drug use stems not only from such environmental factors but also from individual differences in personality. Both delinquency and drug use are deviant behaviors, and therefore both are more likely to be adopted by individuals who are deviance prone. The fact that other forms of delinquency tended to precede drug use (at least in this cohort) may simply reflect the fact that proneness toward deviance is expressed through different behaviors at different ages. Further, for this cohort, the notion of using illicit drugs at all was just rising to consciousness among these young people as they passed through high school. Studies of a more recent class cohort would undoubtedly show less precedence of drug use by other forms of delinquency because the average age of first drug use has declined markedly.

So, while, we have relatively little direct evidence from this study to buttress these alternate hypotheses for explaining the connection between nonaddictive drug use and other forms of delinquency, we intuitively find them most convincing at present. Certainly the hypothesis that the association exists because such drug use somehow causes other kinds of delinquency has suffered a substantial, if not mortal, blow. (Johnston et al. 1978, p. 156)

The studies by Elliott and Ageton (1976a) and by Johnston et al. (1978) are in agreement--the delinquency-drug use relationship is spurious. However, whether the idea that the relationship is causal has suffered a "substantial, if not mortal, blow," is still debatable for several reasons. First, Johnston et al. (1978) focused only on illicit drug use, ignoring the possible role of alcohol. They state: "Neither would we suggest that alcohol, which was not investigated but which is certainly a drug, does not lead to criminal or violent behavior" (p. 155). Second, there is solid evidence that marijuana use is strongly related to drug sales (see Single and Kandel 1978; Johnson 1973; Clayton and Voss, in press), and thus may be related to subsequent delinquency/criminality and use of other illicit drugs, both directly and indirectly. If this is so, the marijuana use-delinquency/criminality relationship may be elaborated by controls on drug sales. Third, neither the Elliott and Ageton (1976a) study nor the study of Johnston et al. (1978) tested the delinquency-drug use relationship by controlling on variables antecedent to both that might be causally related to them in a theoretical sense. In other words, these two studies are essentially atheoretical. In order to address in this paper the issue of spuriousness of the delinquency-drug use relationship and to determine if the conclusion that it is spurious is still debatable, a correlation matrix from an unpublished paper by Krohn and Massey (1979)¹ was analyzed.

KROHN AND MASSEY (1979): SOCIAL BONDING THEORY, DRUG USE, AND DELINQUENT BEHAVIOR

Krohn and Massey (1979) gathered data via self-administered questionnaires from a representative sample of male and female students (n = 3,065) in grades 7 through 12 in six communities within three mid-western states. Four forms of deviance were measured and used as independent indices.

- Alcohol/Marijuana Use. Self-reported frequency with which these two drugs were used.
- Hard Drug Use. Self-reported frequency with which stimulants, depressants, psychedelics, and narcotics were used.
- Minor Delinquency. Self-reported involvement in (a) running away from home, (b) sexual intercourse, (c) truancy, and (d) school suspension and/or expulsion.

¹ Since Dr. Clayton's paper was written, a paper based upon the Krohn and Massey study has been published as: Krohn, Marvin D., and Massey, James L. Social control and delinquent behavior: An examination of the elements of the social bond. *Sociological Quarterly*, 21:529-544, autumn 1980.

- **Serious Delinquency.** Self-reported involvement in (a) vandalism, (b) motor vehicle theft, (c) assault, (d) use of or threatening to use a weapon, (e) theft of things worth \$2 to \$50, and (f) theft of things worth over \$50.

The primary purpose of the study was to test the relative efficacy of three major concepts from Hirschi's (1969) social bonding theory of delinquency: attachment, commitment, and belief.

- **Attachment** was measured by scales tapping the components of (a) supervision, (b) praise, (c) discouragement, (d) closeness, and (e) satisfaction. The questions composing these scales were similar to those used by Hirschi and yielded indices of Maternal Attachment, Paternal Attachment, and Peer Attachment. Krohn and Massey (1979) say: "The item to scale correlations indicate that all three scales have a high degree of internal reliability." (p. 10)
- **Commitment** was measured on four dimensions: (a) grade point average, and by questions similar to Hirschi's dealing with (b) education aspirations and (c) career aspirations. In addition, Krohn and Massey created a (d) commitment scale by asking the students to indicate how important participating in each of the following activities is to them: school work, athletics, musical groups, pep groups, other school activities, church activities, and community clubs.
- **Belief** was measured by three items concerning the degree of agreement or disagreement respondents have with parental norms (i.e., parents' morals are good for me), legal norms (i.e., moral duty to obey the law), and the value of education (i.e., school learning helps find job).

Thus, Krohn and Massey (1979) have a total of 10 predictor variables representing the three major concepts from social bonding theory. They used these variables to predict alcohol/marijuana use, use of hard drugs, minor delinquency, and serious delinquency. While they have the data to do so, neither Krohn and Massey (1979), nor Akers et al. (1979), nor Krohn et al. (undated) seem to have examined the efficacy of these variables in elaborating relationships among the indices of deviance.

Krohn and Massey did provide a zero-order correlation matrix (see table 2 for Pearson r values) for relationships among the three attachment variables, the four commitment variables, the three belief variables, and the four indices of deviance (alcohol/marijuana use, use of hard drugs, minor delinquency, and serious delinquency). With model A and Hirschi and Selvin's (1967) three criteria of causality as guides, this matrix will be analyzed using partial correlation and multiple regression techniques. This analysis will address a basic research question: Is the delinquency-drug abuse relationship among adolescents really spurious?

Krohn, Marvin D., and Massey, James L. Social control and delinquent behavior: An examination of the elements of the social bond. *Sociological Quarterly*, 21:529-544, 1980. © Sociological Quarterly.

Table 2

Zero-Order Correlation Matrix of the Independent and Dependent Variables														
	X ₁	X ₂	X ₃	X ₄	X ₅	X ₆	X ₇	X ₈	X ₉	X ₁₀	X ₁₁	X ₁₂	X ₁₃	X ₁₄
X ₁														
X ₂	.518													
X ₃	.167	.104												
X ₄	.287	.242	.153											
X ₅	.017	.013	.107	.029										
X ₆	.038	.052	.017	.138	.009									
X ₇	.243	.184	.096	.245	-.077	.015								
X ₈	.407	.379	.046	.234	.015	.074	.151							
X ₉	.234	.197	.026	.282	.027	.092	.166	.355						
X ₁₀	.181	.210	.089	.307	-.041	.130	.224	.230	.275					
X ₁₁	-.309	-.266	.009	-.352	.007	-.045	-.272	-.337	-.398	-.242				
X ₁₂	-.245	-.214	-.028	-.286	-.040	.033	-.211	-.209	-.243	-.203	.491			
X ₁₃	-.307	-.247	.000	-.321	.019	-.022	-.325	-.269	-.287	-.236	.593	.424		
X ₁₄	-.277	-.205	-.097	-.267	-.006	.012	-.265	-.251	-.258	-.171	.477	.378	.474	

X1=Maternal Attachment Scale
 X2=Paternal Attachment Scale
 X3=Peer Attachment Scale
 X4=Commitment Scale
 X5=Educational Aspirations
 X6=Career Aspiration
 X7=Grade Point Average

X8=Parents morals are good enough for me
 X9=Moral Duty to obey the law
 X10=School learning helps find job
 X11=Alcohol/Marijuana Scale
 X12=Hard Drugs Scale
 X13=Minor Delinquency Scale
 X14=Serious Delinquency Scale

ASSOCIATION AMONG FOUR INDICES OF DEVIANCE: THE KROHN AND MASSEY (1979) STUDY

The data in table 2 indicate the presence of strong relationships among the four measures of deviance.

- Alcohol/Marijuana--Hard Drugs (r = .491)
- Alcohol/Marijuana--Minor Delinquency (r = .593)
- Alcohol/Marijuana--Serious Delinquency (r = .477)
- Hard Drugs--Minor Delinquency (r = .424)
- Hard Drugs--Serious Delinquency (r = .378)
- Minor Delinquency--Serious Delinquency (r = .474)

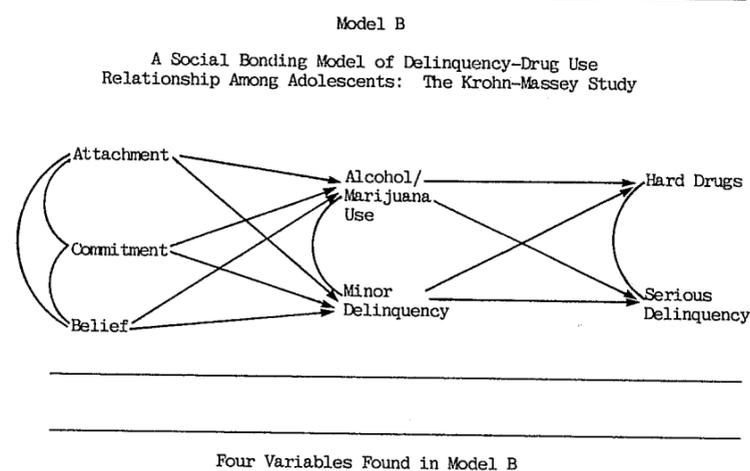
It is clear that delinquency and drug use are associated and thus meet the first criterion of causality. The average correlational value among the four measures of deviance is .473. Given the conservative nature of the Pearson r measure, this is quite high. The average correlational value among the three attachment indices is .263 compared to a value of .086 among the four commitment items and .287 among the three belief items.

TEMPORAL ORDER AMONG THE FOUR INDICES OF DEVIANCE: THE KROHN AND MASSEY (1979) STUDY

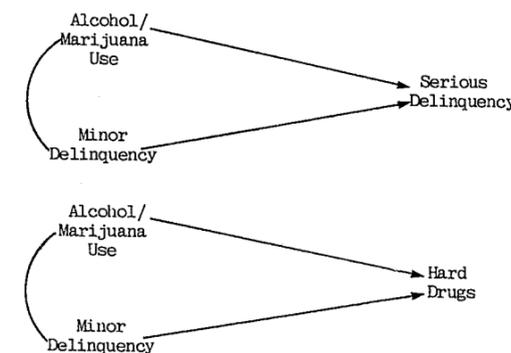
Demonstrating association between delinquency and drug use was a simple task. However, establishment of temporal ordering among the four measures of deviance, the second criterion of causality, will be more difficult since the paper by Krohn and Massey (1979) and other papers based on these data (Akers et al. 1979; Krohn et al. undated) provide no information on the question of time-order of occurrence. Another complicating factor is that the data are cross-sectional. Therefore, any temporal ordering imposed on these variables must be logically and empirically defensible.

We can assume with confidence that minor delinquency and alcohol/marijuana use are both antecedent to use of hard drugs and serious delinquency. Since the data are cross-sectional, it is somewhat more difficult to say with certainty where the social bonding variables should be temporally located with respect to alcohol/marijuana use and minor delinquency. However, given the relatively young ages (12 to 17 years old) of the respondents and the fact that the social bonding items reflect attachments, commitments, and beliefs that are probably stable over time, we have assumed that the theory-based items are antecedent to all four measures of deviance. Finally, it would be unwise to posit a time-order among (a) alcohol/marijuana use and minor delinquency or (b) use of hard drugs and serious delinquency without further data analysis. Therefore, at this point we are dealing with the relationships implied by model B.

With partial correlation techniques we can test some of the assumptions about the temporal order among alcohol/marijuana use and minor delinquency and serious delinquency and hard drug use.



Four Variables Found in Model B



The zero-order and partial correlations among these variables are:

- Alcohol/Marijuana--Serious Delinquency ($r = .477$), controlling on Minor Delinquency produces a partial r of $.276$, a reduction of $.201$.
- Minor-Delinquency--Serious Delinquency ($r = .474$), controlling on Alcohol/Marijuana yields a partial r of $.270$, a reduction of $.204$.
- Alcohol/Marijuana--Hard Drugs ($r = .491$), partial r controlling on Minor Delinquency equals $.329$, a reduction of $.162$.
- Minor Delinquency--Hard Drugs ($r = .424$), partial r controlling on Alcohol/Marijuana equals $.189$, a reduction of $.235$.

Simply put, these findings do not allow us to unambiguously assign temporal ordering to these four indices of deviance. Therefore, for the present we will assume that the blocking of these four variables as seen in model B is a fair reflection of reality for this sample.

Another way of attempting to unravel the time-order among these variables is to regress serious delinquency and use of hard drugs against all variables possibly antecedent to them in model B. It is likely that the standardized partial betas will be higher for those variables most proximate to the dependent variable. It should be noted that the standardized partial betas are synonymous with the unstandardized beta values when a matrix without means and standard deviations constitutes the input.

As the data in table 3 indicate, the order in which alcohol/marijuana use and minor delinquency enter the equation is similar for both serious delinquency and hard drugs: It is clear that alcohol/marijuana use accounts for considerably more of the variance in serious delinquency. It is also clear that the beta for the alcohol/marijuana path to use of hard drugs is considerably stronger than the path from minor delinquency. When the dependent variable is serious delinquency, alcohol/marijuana enter the equation first, but the path from minor to serious delinquency is somewhat stronger. Overall, more than 30 percent of the variance in both serious delinquency and use of hard drugs is explained by all of the predictor variables, although there is a sharp diminution in incremental variance explained after the three behavioral variables enter the equation.

The conclusion that seems best justified, although it is not as clear as one would prefer, is that minor delinquency seems to be marginally more antecedent to alcohol/marijuana use than vice versa. Therefore, model C has been constructed to represent a best guess as to the structure of the relationships among the variables in the Krohn and Massey study.

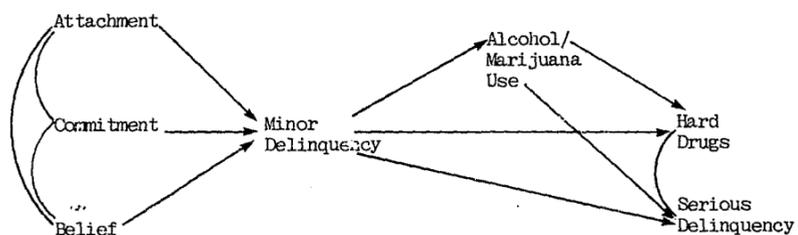
Table 3

Regression of Use of Hard Drugs and Serious Delinquency on 13 Predictor Variables: The Krohn-Massey Study

	Beta	F Value	Cumulative r Square
<u>Dependent Variable = Use of Hard Drugs</u>			
Alcohol/marijuana use	.291	196.877	.241
Minor delinquency	.133	43.815	.268
Serious delinquency	.126	48.061	.284
Commitment scale	-.080	20.979	.291
Career aspiration	.069	19.892	.295
School learning helps find job	-.050	8.920	.298
Educational aspirations	-.046	8.848	.300
Paternal attachment	-.036	3.912	.302
Maternal attachment	-.032	2.775	.302
Grade point average	-.016	.906	.302
Peer attachment	.012	.604	.302
Parents morals are good for me	.016	.770	.303
Moral duty to obey the law	-.014	.646	.303
<u>Dependent Variable = Serious Delinquency</u>			
Alcohol/marijuana use	.212	104.535	.228
Minor delinquency	.231	140.710	.284
Use of hard drugs	.123	48.263	.299
Peer attachment	-.075	23.838	.308
Grade point average	-.072	19.377	.314
Maternal attachment	-.055	8.471	.318
Parents morals are good for me	-.046	6.709	.320
Career aspiration	.035	5.378	.321
Moral duty to obey the law	-.036	4.337	.322
Commitment scale	-.030	2.966	.322
School learning helps find job	.015	.831	.323
Paternal attachment	.011	.342	.323
Educational aspirations		Not in Equation	

Model C

A Revised Model of the Delinquency-Drug Use Relationship Among Adolescents: The Krohn-Massey (1979) Test of Social Bonding Theory



IS THE DELINQUENCY-DRUG USE RELATIONSHIP SPURIOUS?: THE KROHN-MASSEY (1979) STUDY

With the association between delinquency and drug use firmly established and the temporal order tenuously established, it is now possible to test the relationship for spuriousness. It should first be noted that the items designed by Krohn and Massey (1979) to represent the central concepts of Hirschi's (1967) social bonding theory are reliable and are solidly grounded in a widely accepted theory of deviance. In terms of conceptual grounding this test of the delinquency-drug use relationship for spuriousness is somewhat superior to the tests conducted by Elliott and Ageton (1976b) and Johnston et al. (1978).

The data in table 4 indicate unambiguously that Johnston et al. (1978) were not accurate in stating that the "causal" model of the delinquency-drug use relationship "has suffered a substantial, if not mortal, blow." In fact, the data in table 4 indicate that the relationship between minor delinquency and alcohol/marijuana use in the Krohn and Massey study is not spurious. The original relationship ($r = .593$) is not substantially lower in any of the 10 first-order partials. A simultaneous control on all of the 10 antecedent predictor variables produces a 10th order partial r of .458, still statistically significant and significantly different from the zero that would be expected if the original relationship were spurious. While it is true that statistical controls on sociodemographic variables such as age and sex and psychosocial variables such as self-esteem, rebelliousness, and impulsivity were not employed, it is highly unlikely that they would be sufficiently related to both minor delinquency and alcohol/marijuana use to render that relationship spurious.

Table 4

The Minor Delinquency-Alcohol/Marijuana Relationship: Testing for Spuriousness with the Krohn-Massey Study

	Zero-Order r	Partial r
Minor Delinquency-Alcohol/Marijuana Use	.593	
<u>Attachment</u>		
Maternal attachment		.550
Paternal attachment		.565
Peer attachment		.593
<u>Commitment</u>		
Commitment scale		.542
Educational aspirations		.593
Career aspiration		.593
Grade point average		.555
<u>Belief</u>		
Parents morals are good for me		.554
Moral duty to obey the law		.545
School learning helps find job		.568
Simultaneous control on all 10 variables listed above (10th order partial)		.458

SUMMARY AND CONCLUSIONS

The primary purpose of this paper has been to review critically what is known about the delinquency-drug use relationship among adolescents. In doing so the focus has been on applying the widely accepted criterion of causality outlined by Hirschi and Selvin (1967): association, temporal order, and testing the relationship for spuriousness. The extant literature has consistently proven a statistical association between delinquency and drug use. There is also consensus that onset of delinquency usually precedes involvement with illicit drugs. The two studies (Elliott and Ageton 1976a; Johnston et al. 1978) that have most rigorously applied the third criterion of causality also agree that the delinquency-drug use relationship is spurious.

Data from a study of a representative sample of over 3,000 adolescents 12- to 17-years-old were analyzed with regard to the three criteria of causality. While previous findings about association and temporal order were confirmed, analysis of data from the Krohn and Massey (1979) study provides strong evidence that the delinquency-drug use relationship is not spurious.

This finding is quite important and deserves additional comment for several reasons. First, this is the first time that the delinquency-drug use relationship among adolescents has been systematically tested for spuriousness with the results supporting the causal instead of the spurious model. Second, the analysis on which these results were obtained was completely secondary (i.e., the data input was from a matrix in a paper unpublished at the time. Third, this study allowed for testing the relationship for spuriousness with a series of items derived from a widely accepted theory of deviance. One might conclude from these comments that there may be numerous data sets that could be "reanalyzed" using model A and the three criteria of causality as guides.

A preliminary list of such data sets would include the Treatment Outcome Prospective Study (TOPS), the youth sample from the Supported Work study, the national study of adolescent drinking behavior (Rachal et al. 1975), the various national surveys of high school seniors conducted annually by Johnston and his associates, and Howard Kaplan's ongoing longitudinal study of over 9,000 youths in the Houston area, to mention just a few.

It is also important to note again that the Krohn and Massey study was designed explicitly to test a theory of deviance. In recent years a great deal of attention has been devoted to refining and synthesizing extant theories of deviance (Elliott et al. 1979) and theories in the drug field (Lettieri et al. 1980). It is time for those studying drug use and delinquency among adolescents to move beyond description and into the etiology of those phenomena with vigor.

However, the implications of the finding that the delinquency-drug use relationship may be causal instead of spurious extend far beyond the empirical finding. Assume that the relationship, at least among "normal" adolescents, is causal. With such an assumption, it may be possible to devise efficacious early detection and drug education/prevention programs that fall much closer to the primary than the secondary and tertiary end of the prevention continuum. As Blum and Richards (1979) note:

Drug abuse has become such a field in itself that its practitioners sometimes forget that their clients are by legal definition delinquents, and for those heavily drug involved, there are likely to be continuing nondrug crimes as well. (p. 263)

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