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CO-OCCURRENCE OF SUBSTANCE ABUSE WITH CONDUCT, ANXIETY, AND DEPRESSION DISORDERS IN JUVENILE DELINQUENTS

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Abstract — The purpose of the current study was to examine the co-occurrence of substance abuse and three other psychiatric disorders (conduct disorder, depression, anxiety) in an incarcerated juvenile delinquent sample. Diagnostic interviews were utilized to place participants in one of three groups: No substance abuse, alcohol/marijuana abuse, or polysubstance abuse. Frequency of diagnosis and number of symptoms of three psychiatric disorders were then examined. The results indicated that the diagnosis of conduct disorder increased significantly with the occurrence of substance abuse. Also, the number of symptoms for conduct disorder, anxiety, and depression increased with substance abuse. With polysubstance abuse the probability of having more than one of the other psychiatric diagnoses was above 50%. Potential explanations for the findings, focusing on the developmental trajectory for conduct problems and self-medication for internalizing disorders, are discussed.

In today's world of rapidly rising crime, we, as researchers, are compelled to expand our knowledge about crime through an increased understanding of its beginnings in juvenile delinquency. Statistics supporting the urgency of such research include juvenile arrest rates as high as 1.4 million in 1986, and United States expenditures in excess of \$1 billion annually for the maintenance of its juvenile justice system (Patterson, DeBaryske, & Ramsey, 1989). As Loeber (1990) points out, the increase in delinquency from the 1960s to the 1980s has been accompanied by large increases in both the rate of juvenile drug use and the rate of admission to residential treatment centers for emotionally disturbed children. These temporally correlated phenomena raise important questions about their possible interrelationship and subsequent effect on the nature of today's juvenile delinquent. More specifically, a significant number of delinquents may qualify for multiple psychiatric disorders, including the abuse of and/or dependence on alcohol and/or other illicit drugs. Evidence of a high co-occurrence rate for substance abuse and other psychiatric disorders in other populations supports the hypothesis that such a relationship also may exist in a delinquent sample.

In his review of substance abuse in the general adolescent population, Bailey (1989) cites several studies which found associations between substance abuse and other psychiatric problems. In an examination of 126 adolescents and adults in an outpatient drug treatment program, Kleinman, Wish, Deren, and Rainone (1986) report significant relationships between multiple drug use and both deviant behavior and depressive mood. Ross, Glaser, and Germanson (1988) cite numerous studies showing high rates of other psychiatric disorders among abusers of alcohol and opiates. Additionally, in

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their study of adults in both inpatient and outpatient drug treatment programs, Ross et al. (1988) found that 68% of their sample qualified for diagnoses other than substance abuse. Within this sample the most frequent diagnoses, with substance abuse disorders excluded, were anxiety disorders (45%), antisocial personality disorder (36%), and affective disorders (27%). Similarly, in a study of 100 adolescents and adults admitted to a psychiatric hospital, Caton, Gralnick, Bender, and Simon (1989) reported that 51% of the subjects qualified for a dual diagnosis of a psychiatric disorder and substance abuse, based on DSM-III criteria.

Other studies with non-delinquent samples add further support for the relation between psychiatric disorders and substance abuse disorders. Higher levels of substance abuse have been associated with the following: higher levels of antisocial behavior, unipolar depression, bipolar disorder, attention-deficit hyperactivity disorder, borderline personality disorder, and suicide in normal adolescents (Bailey, 1989; Windie, 1990); heavy involvement in deviant activities and depressive mood in adolescents and adults in outpatient drug treatment (Kleinman et al., 1986); anxiety disorders, antisocial personality, and affective disorders in adults in drug treatment (Ross et al., 1988); and schizophrenia and conduct disorder in adolescent and adult patients of a psychiatric hospital (Caton et al., 1989).

Obviously, the rate of co-occurrence of substance abuse and other psychiatric disorders is well established in numerous populations. However, although many studies have reported a relationship between juvenile delinquency and substance abuse (e.g., Jessor & Jessor, 1977; Kandel, Simcha-Fagan, & Davies, 1986; Simonds & Kashani, 1980), only one study with delinquents documents the rate of co-occurring psychiatric disorders (McManus, Alessi, Grapentine, & Brickman, 1984). Further, this same study is the only work on substance abuse in a juvenile delinquent population which has reported the occurrence of this problem after having used specific diagnostic criteria to diagnose substance abuse disorders. McManus et al. (1984) found that all 71 of the incarcerated delinquent adolescents who they studied qualified for multiple DSM-III diagnoses. In 63% of the cases, substance abuse/alcoholism was one of the diagnoses received. Substance abuse/alcoholism co-occurred with a number of other disorders, including depression and conduct disorder.

McManus et al. (1984) concluded that the relationships between substance abuse, other forms of psychopathology, and delinquency are not well understood. The current study was designed to further elucidate these relationships. In particular, we were concerned with the relation of externalizing (conduct disorder) and internalizing (anxiety and depression) problems to substance and alcohol abuse in a delinquent sample. We hypothesized that conduct disorder and substance abuse/alcoholism would co-occur as the former is viewed as following a lawful pattern of development from early childhood through adolescence (e.g., Patterson et al., 1989), and substance use is a component of such a pattern. On the other hand, we hypothesized that substance and/or alcohol abuse would be related to internalizing problems as it serves as a form of self-medication to reduce the symptoms of anxiety or depression (e.g., McManus et al., 1984).

A second purpose of this study was to further delineate the nature of the proposed relationship between substance abuse and other psychiatric disorders. In particular, we were interested in the possible role of severity of substance abuse in the number of psychiatric diagnoses. Kandel (1978) and others (Dupont, 1987; MacDonald, 1984) have demonstrated that substance abuse problems in adolescence can be described as developing through a set of progressive stages, in which an adolescent usually begins using legal drugs (e.g., tobacco), next initiates alcohol use, followed by marijuana, and finally

advance stage substances (e.g., amphetamines, barbiturates, cocaine, & heroin). This developmental progression works in an additive fashion in which advancing from one stage to another often means adding the use of the second and third stage drugs to the earlier ones. It follows that individuals can be divided into groups in order to measure where they fall on this continuum, and this can serve as a measure of the severity of their substance abuse. Based on Kandel's (1978) work, and the nature of substance abuse reported in our sample, three groups were constituted: no substance abuse disorders, alcohol/marijuana disorders, and polysubstance abuse disorders. This division allowed us to investigate how the rate of co-occurring affective, anxiety, and conduct disorders varies with severity of substance abuse. Based on similar work in other populations, it was hypothesized that, in general, the number of diagnoses a youth receives will increase as he or she moves further along the trajectory of substance abuse.

M E T H O D

Participants

The participants were 111 youth who were currently incarcerated in detention facilities in a Southeastern state. Seventy-two of the youth were incarcerated in a youth detention center (juvenile prison), and 39 were incarcerated in other placements (i.e., group home, contract home, community treatment center). There were 90 males and 21 females. Fifty-three of the youth were white and 58 were black. The age range was 12 years, 7 months to 18 years, 7 months (mean = 15 years, 11 months).

The participants were selected from records of the Division of Youth Services (DYS), based on state assigned mental health codes. All youth in the DHS system are assigned a mental health code ranging from 1 to 5, with 5 being the most severe. This is a subjective general rating given by members of a staffing committee at the time a decision is made about incarceration placement. In order to obtain youth who were more likely to have mental health problems, and thus provide a more sensitive test for our hypotheses, youth at mental health levels 3 and 4 were randomly selected using a table of random numbers, all youth at level 5 were selected, and 15 youth from level 2 were also selected.

All youth signed an assent form which delineated the details of participation. Only 3 youths declined to participate, and these were replaced by alternates.

For the current study, the youth were divided into three groups, based upon their level of alcohol and substance abuse/dependence. Abuse and dependence were defined according to DSM-III-R (APA, 1987) criteria, and these diagnoses were assigned based on information received during the diagnostic interview (see Measures section). Fifty-nine youth who were not diagnosed as having an alcohol or substance abuse or dependence problem were assigned to one group. Twenty-three youth who were diagnosed as having alcohol abuse or dependence alone, or in conjunction with marijuana abuse or dependence, were assigned to a second group.¹ The third group consisted of 29 youth who were abusing or dependent on illicit substances other than alcohol or marijuana. In all cases these subjects were abusing multiple substances and, therefore, can be referred to as polysubstance abusers. In the large majority (22 of 29) of these subjects,

¹Three additional youth reported diagnosable problems with marijuana only. Since their position in the trajectory could not be ascertained, they were omitted from the study. Additionally, very few youth were found to be abusing alcohol and not marijuana. For this study, therefore, alcohol/marijuana and alcohol only abusers were collapsed into one group.

this meant advanced stage substance abuse/dependence plus alcohol and cannabis abuse/dependence. For the remaining subjects who qualified for multiple substance diagnoses, multiple advanced stage substances were used. The advanced stage substances abused by this group included (in order of frequency) amphetamines, cocaine, hallucinogens, barbiturates, inhalants, and opiates.

Measure

Diagnostic Interview Schedule for Children (DISC-2). The DISC-2 (Shaffer, Fisher, Piacentini, Schwab-Stone, & Wicks, 1989) is a structured interview which is administered to children and adolescents to yield psychiatric diagnoses. The instrument contains 408 items which inquire about past and current symptoms. The interviewer asks questions, clusters of which correspond to DSM-III-R symptoms, that can be answered as no, sometimes/somewhat, or yes. Algorithmic formulas, based upon the number of "yes" and "sometimes/somewhat" answers to a cluster of symptom questions (range 1-3 per symptom), determine the presence or absence of symptoms. Based on the criteria specified in DSM-III-R, a youth subsequently either is assigned or not assigned a particular psychiatric diagnosis. The diagnoses pertinent to this study were conduct disorder, major depression and dysthymia, overanxious disorder, and substance and alcohol abuse or dependence.

Procedure

After a youth was selected for participation, the facility in which he or she resided was contacted and an interview appointment was arranged. Interviews were conducted by four advanced level graduate students in clinical psychology. Each of these four individuals had extensive experience in interviewing and assessing mental health problems. Prior to the assessment of the youth included in this project, interviewers were taught to elicit responses for each symptom on the DISC-2. Training was conducted by a licensed clinical psychologist with extensive experience in conducting structured clinical interviews. Interviewers also practiced conducting interviews with a fellow interviewer and with incarcerated youths who were not participating in the project.

In order to obtain inter-rater reliability during actual data collection, 18% of the interviews were tape-recorded and subsequently scored by a second rater. Agreement across raters was 97% and was calculated based on percent agreement for each item, rather than for each diagnosis.

R E S U L T S

Chi-square analyses were utilized to examine the frequency of diagnoses occurring at each level of substance abuse. The data for each of the three diagnostic categories examined, as well as the chi-squares, are presented in Table 1. The results indicate that, with either alcohol/marijuana or polysubstance abuse, there is an increase in the percentage of subjects who are diagnosed with conduct disorder. For anxiety, as well as for depression, there is a similar trend, especially for polysubstance abuse. However, only the conduct disorder chi-square was significant ($p < .01$), while for anxiety, the chi-square was marginally significant ($p < .09$).

Number of symptoms of each disorder, which may be a more sensitive measure than diagnostic categories, also was examined. However, before doing so, the groups were

Table 1. Percentage of subjects in each substance abuse category who received each of three diagnoses

Substance abuse	Conduct disorder	Anxiety	Depression
None	62% (37/60) ¹	17% (10/60)	30% (18/60)
Alcohol/marijuana	96% (22/23)	22% (5/23)	26% (6/23)
Polysubstance	93% (27/29)	38% (11/29)	48% (14/29)
χ^2	16.62	5.00	3.71
$p <$.01	.09	ns

¹Number in parentheses indicates number of subjects in each drug use category receiving particular diagnoses.

examined to determine whether differences existed on other important variables. There were no differences between the groups on length of incarceration ($F(24,85) = .38$, $p = ns$). Additionally, chi-square analyses indicated the groups did not differ by gender ($\chi^2(2, N = 111) = .33$, $p = ns$) but did differ by race ($\chi^2(2, N = 111)$, $p < .01$). Therefore, race was used as a covariate in the one way analyses of covariance which were subsequently performed.

The mean number of symptoms for each diagnosis in each substance abuse category is presented in Table 2. For two variables, a significant effect for substance abuse emerged. That is, number of conduct disorder symptoms ($F(3,107) = 7.36$, $p < .01$) and number of depression symptoms ($F(3,107) = 3.70$, $p < .05$) were related to the level of substance abuse. Number of anxiety symptoms ($F(3,107) = 2.19$, $p < .11$) did not reach significance but produced a trend in the expected direction. Newman-Keuls tests indicated that, for conduct disorder, youth who were not substance abusers differed from alcohol/marijuana abusers and from polysubstance abusers ($p < .05$). Depression symptoms significantly differentiated those who were not substance abusers from polysubstance abusers ($p < .05$).

The next question examined was whether the number of diagnoses increased as a function of substance abuse. The percent of subjects in each substance abuse category who received 0, 1, or more than one of the three psychiatric diagnoses (depression, anxiety, conduct disorder) is presented in Table 3. A chi-square analysis of number of diagnoses (0-3) by level of substance abuse was significant ($\chi^2(6) = 18.67$, $p < .01$). Most notable in Table 3 is the finding that, for alcohol/marijuana abusers and polysubstance abusers, having no other diagnosis is uncommon, while having multiple diagnoses occurs more frequently for polysubstance abusers than is true of any other substance abuse level, particularly the no substance abuse category.

Table 2. Mean number of symptoms of each diagnosis for each substance abuse category

Substance abuse	Conduct disorder ¹	Anxiety	Depression ¹
None	3.83 ^a	1.83 ^a	2.55 ^a
Alcohol/marijuana	5.19 ^b	2.14 ^a	3.15 ^{a,b}
Polysubstance	5.88 ^b	2.84 ^a	4.1 ^b

¹Means in each column with different superscripts differ significantly ($p < .05$).

Table 3. Percentage of subjects in each substance abuse category who received 0, 1, or more than 1 diagnoses

Substance abuse	Number of diagnoses		
	0	1	>1
None	22%	53%	26%
Alcohol/marijuana	4%	52%	43%
Polysubstance	3%	41%	56%

DISCUSSION

The purpose of this study was to extend the research in the area of co-occurring substance abuse disorders and other psychiatric disorders in juvenile delinquents. Results of chi-square analyses indicate that our hypothesis regarding the co-occurrence of substance abuse and other types of disorders was partially supported in our sample. Specifically, support was found for conduct disorder, with a similar trend observed for anxiety. Additionally, when a more sensitive measure (i.e., number of symptoms) was used, conduct disorder and depression were significant co-occurring factors with substance abuse disorders, with a similar trend emerging for anxiety. With number of symptoms as the dependent measure, polysubstance abuse was the primary substance abuse category which differed from the no substance abuse category.

Speculation abounds as to the reasons why substance abuse disorders and other psychiatric disorders co-occur, with the most frequent assumption being that one has a causative effect on the other. Clearly, our data can not address cause-effect relationships. In fact, without longitudinal data from early childhood through adolescence, the search for causal relationships will probably not be a productive effort as the relation is likely a transactional one. That is, once the two disorders emerge, each will influence the other, leading to a spiraling effect for both disorders. Nevertheless, without implying causality, consideration of the *sequence* of development of substance abuse with other psychiatric disorders would be fruitful.

In the area of conduct disorder, substance abuse can be viewed as a deviant behavior (although not necessary for diagnosing conduct disorder), and, therefore, involvement in substance abuse is likely to be correlated with involvement in other deviant behaviors, with one possible result being the syndrome of conduct disorder. Patterson and his colleagues (e.g., Patterson et al., 1989) have presented a developmental model for the emergence and persistence of antisocial behavior. Such behavior follows a trajectory from poor parenting to coercive parent-child interactions to rejection by peers and school failure to commitment to a deviant peer group and, then, to delinquency. Based on a meta-analysis of antisocial conduct problems by Loeber and Schmalting (1985), substance use is related to associating with a deviant peer group. Taken in combination, the work by these two groups of investigators suggests that conduct problems follow a lawful pattern of development and that substance use is a component of such a pattern. Such a conceptualization avoids the issue of determining the "cause and effect" relation between conduct disorder and substance abuse. Rather, it stresses the sequential and interlocking pattern of these two disorders.

When the relation of substance abuse to internalizing disorders (anxiety and depression) is considered, any interpretations offered have to be considered with caution

because our findings were not robust, i.e., significant group differences emerged only for a number of depression symptoms. Nevertheless, most data suggest that an internalizing disorder serves as an antecedent to substance abuse. It has been shown that individuals select drugs more often under conditions of dysphoria (Uhlenhuth, Johanson, Kilgore, & Kosaba, 1981) and that psychological distress predicts escalation in adolescent substance use (Kaplan, Johnson, & Bailey, 1986). In addition, Farrow and French (1986) reported that, in their sample of juvenile delinquents, the reason for using drugs given most often (74%) was to decrease feelings of sadness and depression. Simons, Conger, and Whitbeck (1988) have built depression into their social learning model of adolescent substance abuse. They propose that substance use, especially for those with depression or anxiety, may act as a negative reinforcer for their emotional distress. In sum, the above arguments make a case for the hypothesis that juvenile delinquents may be abusing substances as a means of self-medication and that this represents a probable explanation for our finding that substance abuse disorders and number of depressive symptoms are related.

Although less research is available examining the relation between anxiety and substance abuse disorders, it would appear that the self-medication hypothesis is equally plausible here. The Simons et al. (1988) model places anxiety alongside depression as a source of emotional distress likely to lead to the abuse of substances. Also, other researchers (Carrol, 1981; Kandel, 1981) have listed anxiety as one of several personality traits which often predates the onset of substance use.

A second question examined in this study was whether adolescents were more likely to have multiple diagnoses the farther along they were on the substance abuse trajectory. We know that substance abuse is often a temporally increasing phenomenon; it advances to more serious degrees with time (Kandel, 1981). A logical question is whether this advancement through substance abuse stages is accompanied by an increase in not just a single additional psychiatric disorder, but rather multiple other disorders. Our results tend to support this hypothesis. One possible explanation for this increase in multiple disorders with movement on the substance abuse trajectory could be that an unidentified stressor leads to a general increase in psychiatric disorders, including substance use. Alternatively, heavier substance use could lead to multiple psychiatric problems. Or, the other psychiatric difficulties can be a precursor to heavier and more involved alcohol and substance abuse. However, as was noted earlier, the process is likely to be a transactional one with the other psychiatric disturbances accelerating substance use and substance use accelerating psychiatric difficulties. Whatever the sequence, the outcome is clear. Increasing substance abuse (i.e., movement from alcohol to polysubstance abuse) is associated with a trend for an increasing number of symptoms of *each* of the three disorders examined and a greater likelihood of multiple diagnoses.

It is clear from this study that a group of adolescents exists who are at high risk for the co-occurrence of substance abuse and an elevated level of symptoms indicative of difficulties representative of at least three other psychiatric disturbances. It is important for future research to attempt to untangle the relationship among these disorders and to examine demographic, family, and personal predictors of youth who have multiple diagnoses. Only with such efforts can prevention programs be designed and implemented. Furthermore, in terms of treatment, the current results suggest that for many juvenile delinquents interventive efforts will need to be multi-faceted as substance abuse can be associated with multiple other psychiatric disorders.

Finally, in addition to future research addressing the issues raised above, future work should attempt to replicate the present results with samples in other youth detention centers. Such work will allow a test of the generalizability of the current research efforts.

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