Violent Behavior as Related to Use of Marijuana and Other Drugs

Alfred S. Friedman, PhD
Kimberly Glassman, BA
Arlene Terras, PhD

ABSTRACT. The relationship of the degree of use of each of ten types of illicit drugs with each of eight types of violent criminal offenses, is reported for an African-American, inner-city, low SES, young adult study sample (N = 612). Prospective data from the time of birth was available for the statistical analyses, to provide 51 control variables on factors other than substance use which might predict to later violent behavior.

Findings: Greater frequency of use of marijuana was found unexpectedly to be associated with greater likelihood to commit weapons offenses; and this association was *not* found for any of the other drugs, except for alcohol. Marijuana use was also found associated with commission of Attempted Homicide/Reckless Endangerment offenses. Cocaine/crack and marijuana were the only two types of drugs the frequency of use of which was found, for this sample, to be significantly related to the frequency of being involved in the selling of drugs. These findings may *not* apply to a middle-class African-American sample.

Alfred S. Friedman, Kimberly Glassman, and Arlene Terras are affiliated with Belmont Center for Comprehensive Treatment, 4200 Montunent Road, Philadelphia, PA 19131.

Address correspondence to: Alfred S. Friedman, PhD, Research Center, 4081 Ford Road, Philadelphia, PA 19131.

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INTRODUCTION

This is a report on the degree to which those individuals who have used each of nine types of illicit drugs, or alcohol, up to age 24, engage in violent behavior during the ensuing 2 1/2 year period. This report also has a more central focus on the relationship of marijuana use to drug selling and to violent behavior, in an inner-city community African-American young adult population.

The Relevant Research Literature. The National Institutes of Justice in 1993 endorsed the conclusion of the Federal General Accounting Office, that research on the interrelationship of individual, familial and situational risk factors in alcohol and drug abuse may be especially important in understanding and preventing violence and criminal behavior. According to the SAMHSA 1998 Statistics Source Book,[1] 28% of the convicted jail inmates, in 1991, who were under the influence of some type of drug alone, or in combination with alcohol, at the time of their current offense, had committed a violent type of offense (either homicide, sexual assault, robbery, and assault).

A NIDA Research Monograph by De La Rosa et al.[2] summarized the relevant research dating from the late 1960's, as: ''. . . the primary substance implicated in violent crimes has been alcohol, far more often than illicit drugs. Alcohol abuse and violence are endemic to America's culture, dating back to the days of prohibition.'' The research findings that were reported in this NIDA monograph from the 1970's and 1980's indicated that, although certain types of illicit drugs, e.g., stimulants, hallucinogens, may be associated with violent behavior, most psychopharmacologically induced violent crimes continued to involve alcohol. In the mid- to late 1980s, reports of increased violence from crack use and distribution networks among inner-city minority communities made it urgent to develop strategies for intervention and control.

Goldstein[3] developed a conceptual framework to explain complexities between violence and drugs, as follows: ''. . . The psychopharmacologic dimension refers to effects of substances on behavior, as when consumers become irrational, excited, agitated, or unable to control their anger and violent impulses. The economic compulsive dimension refers to violent crime committed to obtain money or other

forms of currency to purchase drugs for personal use. The systemic dimension addressed violence intrinsic to the lifestyles and business methods of drug distributors and traffickers.''

Based on a review of findings from earlier studies,[4-7] Abram and Teplin[8] concluded somewhat similarly to the conceptualization by Goldstein[2] quoted above, as ''. . . Violence is determined by an interplay of factors: the emotional states and motivations of the suspects and victims, pharmacologic influences, the financial demands of sustaining a habit, and the systemic context, i.e., the inherent danger of illegal drug distribution.'' A drug-induced pharmacological effect leading to intoxication and impairment of cognitive abilities and confusion can also result in violent behavior, according to Pernanen.[9]

From a review of the relevant research literature published up to 1997, the author of this paper, Friedman[10] concluded as follows: ''the preponderance of the research evidence supports the conclusion that the abuse of certain types of illicit drugs, separately from the abuse of alcohol, predisposes to subsequent violent behavior.''

There have been many studies over a long period of time, that reported that the use/abuse of alcohol is a significant factor in the tendency to act violently. These findings referred primarily to the more immediate effects, during the period when the individual was under the influence of alcohol. From a longitudinal study of alcoholism, McCord,[11] concluded as follows: ''. . . Although alcoholism and criminality tended to co-occur, there was no evidence that alcoholic criminals tended to commit more crimes of a serious nature than did non-alcoholic criminals.'' Thus, it is possible that the degree of use of alcohol during an earlier period may not predict to violent behavior during a alcohol during an earlier period may not predict to violent behavior during a later period to any greater degree than does the past degree of use of certain types of drugs.

Dembo et al.[12] reported on the ''systematic violence'' and the ''web of relations'' in the lives of their study group of adjudicated multi-ethnic male adolescents in Tampa, Fl, as ''. . . crimes against persons were significantly and directly related to engaging in drug sales, and crimes against persons were also found to be indirectly related to cocaine use, through drug sales.'' The relationship of cocaine/crack to violent crime has been reported by Inciardi[13] to be established more clearly for users of crack in inner-city areas than it has for those who are users of other forms of cocaine in the general population.

Kaplan and Damphouse[14] reported that early drug use in the seventh grade (i.e., marijuana and narcotics) predicted later violent behaviors at age 26, when controlling for early violence. However, the adolescent drug use in that study was found to account for only one percent of the variance in young adult violence.

Drug use by persons with antisocial personality could reasonably be expected to increase any tendency to act violently. On the other hand, such drug use has also been postulated to be an attempt to assuage violent tendencies through self-medication.[15,16] To the extent that this might occur, it indicates that having violent tendencies can predispose to substance use/abuse, which is the converse of the relationship proposed for study in this paper. Accordingly, it is a potential confounding factor that should to be controlled for in the analyses performed for our study.

Relevant Research Findings on African-American Samples. Homicide in recent years has been the leading cause of death for young Black male adults, and the lifetime risk of death from homicide has been six times greater among black than white males.[17] The lifetime risk of death from homicide, during the 1980's, was one in 28 for Black men, six times as great as for White men.[18] Assaultive violence in the United States takes its greatest toll among minorities, and young men. Hammond and Yung[19] reported, based on a review of other research studies, that: (1) inner city Black youth are at 4 times greater risk of committing assaultive violence than White youth; (2) that Blacks have family-friend acquaintance homicide rates that are 6 times higher than Whites; and (3) that Hispanics have the highest homicide rates by gang-related violence.

Rosenberg and Fenley[20] concluded from their review of the relevant research literature, that it is difficult to disentangle the contribution of race from socio-economic status in explaining the high homicide rates among black men, but that several studies suggest that socioeconomic status is the more important determinant.

Staub,[21] in discussing the increase in youth violence in the United States, refers to difficult life conditions such as poverty and discrimination against minority groups, and to unfulfilled or frustrated basic needs. He also relates some of the violent behavior of African-American youth to the devaluation of the group, to the legacy from slavery and racism, and to a problem that these youth have in overcoming a confusion of identity, as they try to negotiate their lives in two differ-

ent cultures. The drug dealing and drug wars that occur in impoverished urban areas tend to involve some of the young African-Americans as well as adults, particularly those who have limited job opportunities. Kaplan and Damphouse[14] postulated that given an intra-psychic state of self-derogation, when it is ". . . in combination with the influences of the experiences of economic deprivation and minority status, as these factors relate to drug abuse and antisocial and criminal behavior, and in the absence of conventional coping mechanisms and of related personal and social resources, and in the absence of conventional bonds, and in the socially disapproved circumstances that induce social rejection and consequent psychological distress" . . . the individual then becomes more prone to engage in acquisative and violent behavior.

Anderson[22] in his assessment of the crisis situation in the jobless urban Black ghetto areas, where it is difficult for the young men to obtain jobs that would enable them to become family breadwinners, states: "They father babies, but they don't follow through by caring for them if they are likely to be challenged–dissed–by the woman involved. This then can lead to abuse. . . . teenage pregnancy, drug abuse, drug dealing, violence and crime is far too common."

In an earlier longitudinal study[23] of an African-American sample, the authors of this paper reported that the frequency of use of drugs, during lifetime up to age 24, was found to predict to the degree of violent behavior during the ensuing 2 1/2 year period, for both men and women.

A finding relevant to the new study being reported in this paper regarding the differences between race-ethnic groups, was as follows: that young black males, compared to non-black predominantly white young males, have a higher prevalence rate of use/abuse of crack and of involvement in violent behavior, and that these behaviors are influenced by the fact that a higher proportion of young black males are actively involved in dealing cocaine/crack in some inner-city poverty areas.[13]

Description of the Study Sample (N = 612). The sample was 100% African-American, and was composed equally of males and females. Average age was 26.23 (S.D. = 1.52). Seventy-three percent of the sample had a high school diploma and 75% were single. A variety of living arrangements were reported: (I) living with their parents (25%); (2) living with their children and their parents (14%); (3) living with

their children and a partner (24%). More males than females (35% to 15%) reported that they were living with their parents and without any of their children. Fifty-eight percent of the sample reported having worked full-time for the three month period prior to assessment. Average income was reported as $14,103; $17,051 for the males and $11,196 for the females, which was close to the federal income guidelines for poverty status (see Table 1).

METHODS

The longitudinal study reported here utilized prospective data that was available on the behavior and life conditions during childhood, of a sample of inner-city, low SES African-American community subjects, in order to develop control variables for use in statistical analyses constructed for this study. The childhood data file had originally been developed by the National Collaborative Perinatal Project (NCPP), in a study which was initiated in thirteen cities in the late 1950's by the National Institute of Neurological and Communicative Disorders and Stroke (NINCDS). When the low income mothers of the NCPP subjects had been pregnant, they had come to the hospital emergency room for maternity services and delivery. Comprehensive systematic early life information was developed on those subjects born from 1959 to 1966, who were studied from birth to seven years of age. For each mother-child pair, information was collected in the areas of obstetrics, neuropsychology, neurology, psychology, pediatrics, overall family history and the history of the health of the family members. Some of the psychological tests administered at 7 years of age included: WISC, RAT, Bender-Gestalt, Goodenough Human Figure Drawing tests, and the Illinois Test of Psycholinguistic Abilities, 7-Year psychologist's behavior rating scale, and a speech, language and hearing examination. In all, there were more than 400 variables in the data file.

The sample for this study (N = 612) was developed by the following procedures: From the total of 8,000 in the Philadelphia NCPP sample, 640 were retrieved initially for study at average age 24. The retrieval rate was 89% of all of those that had been randomly selected. Two and one-half years later, at T_2, 380 of the original 640 were re-retrieved for this study. This subsample represented nearly all of those in the original sample who had used any drugs or alcohol. In addition, 232 new

TABLE 1. Demographic and Background Variables

Demographic Feature	**Males (N = 306)**	**Females (N = 306)**	**Total (N = 612)**
Race:			
African-American	100%	100	100
Education:			
High School Diploma	70.5	74.8	72.7
GED	9.8	9.5	9.6
Marital Status:			
Single	78.0	72.2	75.2
Divorced	2.3	2.9	2.6
Married	15.4	19.3	17.3
Living Arrangements:			
With parent, child and/or partner	3.9	23.5	13.7
With partner and children	25.6	22.5	24.0
With children only	0.3	21.6	11.1
With parents	34.8	14.7	24.7
With partner only	11.8	6.9	9.3
Alone	11.5	5.9	8.7
Other	12.1	4.9	8.5
Number of Months Employed:*			
0 (None)	23.3	44.1	33.9
1 month	4.3	2.3	3.6
2 months	6.2	2.9	4.3
3 months	66.2	50.7	58.3
Legal Annual Earned Income: ($)	$17,051	$11,196	$14,103
Age: [mean] (S.D.)	26.14 (1.48)	26.32 (1.56)	26.23 (1.52)

*Number of months worked full-time in preceding three-month period.

subjects, who were determined by correspondence and telephone interviews to have been involved in some drug or alcohol use, were recruited for this study. The 380 re-retrieved from T_1, plus the new subsample of 232, together constitute the sample of 612 for this study, all of whom were assessed at T_2, at average age 26 1/2: (380 + 232 = 612).

Thus, the sample for this study was not strictly representative of an inner-city, low SES, African-American community. It is, rather,

roughly representative of that part of such a community that had been involved in the use of drugs.

Table 2 shows the percentages, separately for the male subsample and for the female subsample, that had used each of ten types of substances at least five (5) times during a single month. As can be seen, cocaine/crack was the third most frequently used type of substance, after alcohol and marijuana. A direct comparison of the prevalence rates with those reported by the National Household Survey (NHSDA) is not feasible since our sample is only up to age 26 1/2, while the national sample includes all adults. Nevertheless, the following comparisons suggest that this study sample was probably involved in substance use to a degree greater than the national average: The prevalence rate for alcohol use in 1996 reported by the National Household Survey (NHSDA) was 74%; and is 93.3% for our study sample. Similarly, the prevalence rate reported for marijuana use in the national sample was 37%, compared to 73% in our sample (see Table 3).

Excluded from our study were subjects: (1) Whose full-scale I.Q. score on the WISC, at 7 years of age, was less than 70; (2) subjects who had manifested evidence of fetal alcohol syndrome (FAS), prenatal or post-natal growth retardation, central nervous system involve-

TABLE 2. Prevalence Rates of Lifetime Use, to Age 26, for Each of Ten Substances, by Gender (N = 306 for Males and N = 306 for Females)

	Used 5 Times Within a Single Month (%)		Number of Months of Regular Use* (%)	
Substance	**Male**	**Female**	**Male**	**Female**
Alcohol	86.2	69.0	81.8	42.4
Marijuana	66.2	48.4	53.5	34.0
Amphetamines	8.5	8.8	2.8	1.3
Barbiturates	7.9	2.9	2.3	0.8
Tranquilizers	14.1	9.2	4.1	2.1
Cocaine/Crack	37.4	22.2	15.7	7.2
Heroin	1.3	0.0	0.5	0.0
Other Opiates	8.5	3.3	2.3	1.9
PCP/Hallucinogens	6.2	0.7	0.9	0.1
Non-Prescription Drugs	1.0	1.6	0.1	0.1

*"Regular Use" is defined as use on at least two days during a one-week period.

TABLE 3. Drug Prevalence Rates for the Sample (N = 612) Compared to Prevalence Rate from the 1996 National Household Survey Percentage Reporting Each Type of Drug, Lifetime, by Race/Ethnicity

Drug	U.S. White	U.S. Black	The Black Study Sample (N = 612)
Marijuana	39.0	37.0	72.7
Cocaine/Crack	14.0	13.0	41.7
Inhalants	7.0	2.0	1.0
PCP/Hallucinogens	14.0	6.0	7.2
Heroin	1.2	1.4	1.1
Other Opiates	-	-	9.0
Stimulants	0.4	0.2	11.9
Sedatives/Tranquilizers/Analgesics	2.0	1.3	20.0
Alcohol	87.0	74.0	93.3

ment, an active psychotic state, or evidence of an organic brain syndrome. Since 89 percent of the total original Philadelphia sample (N = 8,000) were African-Americans, only African-American subjects were included in this study.

The Predictor Variables, which were measures of the degree of use of each of nine types of drugs and alcohol, were developed by administering *The P.P.C. Drug Use Inventory.* This is an instrument developed by the authors to collect information regarding the frequency of drug use and the duration of ''regular'' drug use of various types of drugs. ''Regular'' use was defined as use at least 2 days per week.

The scores for use of each type of drug (to be entered as the key predictor variable in each of the analyses to be performed), was the product of the number of months of ''regular'' use of the drug, times the average frequency of use of the drug. The code for scoring frequency of use was the following nine-point scale: no use during the month = 1; once per month = 2; once every 2-3 weeks = 3; once per week = 4; 2-3 times per week = 5; 4-6 times per week = 6; once a day = 7; twice a day = 8; three or more times per day = 9.

Control Variables. In constructing an analysis for determining the degree to which substance use influences individuals to act violently, it is indicated to control for as many as possible of the factors other than substance use that might predispose persons to act violently. That

would include many different characteristics of the individual and many life conditions; and it is unlikely that any one study could fully accomplish this goal. While it is clear that this longitudinal study will fall short of the optimum goal, the substantial list of control variables detailed below suggests that our analyses should produce an estimate that is not grossly exaggerated, of the relationship of the use of illicit drugs or alcohol, to subsequent violent behavior.

Twelve of these NCPP early child variables were found to be significantly correlated with the score for violent behavior up to age 26 1/2, the dependent variable, and were therefore considered as potentially etiological for later violent behavior. These 12 variables were accordingly entered into each of the nine partial correlation analyses that were performed, as a block of control variables. These NCPP childhood variables that were found to be significantly associated with, and thus to predict to illegal violent behavior in adulthood, were: Clinging to mother, in infancy; intense social over-reaction, in infancy; poor gross motor development, in infancy; lower intelligence, at age 4; some rigidity, at age 4; higher than usual amount of activity and restlessness, at age 7; resistive to demands or directions, at age 7; shows little concern on separation from mother, at age 7; spends more than average time on tasks at age 7; abnormal behavior, at age 7; higher number of children in the home at age 7; and having higher number of sisters.

Academic Performance, School Behavior and Adjustment as Control Variables. The prospective data that has been made available from school records of the Philadelphia School District includes: (1) California Achievement Test scores measuring ten basic academic skills such as reading, math, language, etc., in the 8th grade (at 13-14 years of age); (2) Behavior and adjustment in high school up to 16 years of age, which includes the numbers of suspensions, expulsions, etc.; and (3) The School District ''Drop Code'' score, indicating whether the subject had dropped out of high school.

Additional Control Variables Were Derived from the Administration of the Following Instruments: The *"Whether It's Wrong" Scale* is a 20-item scale adopted from the ''Attitudes Towards Deviance'' Scale of Jessor and Jessor.[24] The subject responds to each item by rating on a 10-point scale, presented with anchor points such as ''No, not wrong,'' ''A little bit wrong,'' and ''Very wrong.'' (The participant is instructed to respond according to the attitudes he/she held at 12 years

of age.) The scale includes such items as: ''To cheat on tests''; ''To swear or curse''; ''To cut school''; ''To take things that don't belong to you,'' etc. These measures of deviant attitudes were used as control variables since such deviant attitudes may have preceded the initiating of substance use.

The Instrument for Measuring "Conduct Disorder" Was the "HK/MBD Checklist," developed by Tarter et al.[25] This 13 item checklist yields a continuous measure and total score for behaviors that have been considered to be indicative of hyperactive, impulsive and aggressive behavior in children and adolescents. The subject reports retrospectively on his behavior and attitudes as they were at age 12. Alterman and McLellan[26] reported ''high test-retest reliability and a significant correlation (+0.47) between the patient's retrospective self-report and first degree relatives' retrospective ratings of the patient on the same questionnaire.''

Antisocial Personality (ASP). Since anti-social types of behavior are clearly relevant as possible risk factors for substance abuse as well as for tendencies to act violently, it was indicated to control for this type of behavior in our analyses. The items of the Diagnostic Interview Schedule (DIS) that were developed for establishing an ASP diagnosis, based on DSM criteria, were presented in a structured interview format.[27] These items refer to whether certain antisocial, delinquent and socially deviant behaviors occurred (e.g., stealing, frequent fighting, fire setting, physical cruelty to animals, use of a weapon, forcing another into sexual activity, etc.). The author of this structured interview instrument reported that a concordance value of .73 that was found between lay interviewers' and psychiatrists' diagnoses for antisocial personality disorder, ''is excellent compared with those reported in the literature for the reliability of other instruments.'' (The author suggested that the ''concordance'' score, based on a test-retest design, had some implication for the reliability of the instrument.)

Our study participants were instructed to respond to the items according to the behavior that they engaged in through age IS. Thus, this variable was utilized as a partial control for the violent behavior that occurred before age 16, which in most instances was before the initiation of heavy use of drugs or alcohol.

There were nine control variables on family problems that occurred at the time the subjects were 16 years of age (e.g., mother had a drug or alcohol problem; father had a drug or alcohol problem; subject ran

away from home; subject lived in a foster home; mother related negatively to subject; subject behaved negatively toward family; parents fought physically; degree of family conflict; etc.). There were 16 control variables on the subjects' deviant and delinquent social behavior, and their relationships with delinquent peers, up to the time the subjects were 16 years of age (e.g., the number of times the subject was ''picked up'' by the police; the amount of time per week spent with peers ''partying,'' in bars, etc.; the number of ''best friends'' who were in trouble with the police; involvement in (''gang fighting,'' etc.). The three instruments described above (the WIW, the HK-MBD Checklist, and the DIS for the ASP), and the questionnaires on family problems and on social behavior-peer relationship problems, were administered at T_2. The subjects were instructed to describe their behavior and their families' problems as they were when the subjects were either 12, or 15, or 16 years of age. Thus the T_2 assessment included both prospective and retrospective data.

Two variables were utilized to control for the subject's response set, as follows: The (MMPI) Lie Scale score (for measuring degree of denial and misrepresentation), and the short 15-item Crowne-Marlowe Social Desirability Scale score,[28] for positive response set and defensiveness. It was expected that some of the subjects would tend to deny, minimize, or simply misrepresent the degree of their substance use or other negative behavior. (These two instruments were administered twice, at T_1 and T_2 assessments.)

Measures of Illegal and Violent Behavior (Dependent outcome variables). Denno[29] found from an analysis of data collected from a subsample of NCPP subjects in Philadelphia, that the number of offenses is associated with total offense seriousness and is the best single indicator of offense behavior. We have found in earlier research studies on illegal behavior that subjects' self-reports tend to be more complete than police or court records. Accordingly, it was considered to be appropriate for this study to use the more readily available self-report of illegal offenses as the basis for deriving the measures of violent behavior.

The Criminal Behavior Inventory was administered twice, at the T_1 assessment, and again at the T_2 assessment. It is an instrument based on a structured interview for organizing and recording 20 types of illegal offenses that the subject reports that he/she committed, and the number of convictions for each type of offense. ''Possession'' offenses

(i.e., possession of alcohol, or illicit substances) were excluded from the offense list. ''Drug sales/trafficking'' offenses, on the other hand, were included. Ninety-two (92) of 306 males and 35 of 306 females reported that they had been engaged, at least one time, in selling drugs.

Two examples of the questions asked are: For *assault*, ''How many times in your lifetime did you get into a fight and either punch, hit, beat or injure someone when it wasn't only in self-defense?'' (Minor fights and assaults, such as school fights, ''shoving matches'' or incidents of accidental injury were not counted); For *recklessly endangering the life of another person, attempted homicide*, ''During any of the assaults or fights you had, did you ever hurt someone so seriously that he/she could have died or you expected that he/she might die, but did not–that is, he/she was severely hurt, injured, bleeding and needed to see a doctor or go to a hospital?''

Eight of the types of offenses included in the inventory are classified as violent criminal offenses: Assault and Battery, Gang (Drug War) Fighting, Robbery, Weapons Offense, Rape, Arson, Reckless Endangerment/Attempted Homicide, and Homicide/Manslaughter.[30] In a simplified short method of scoring for seriousness of offenses, relative weights were assigned to each type of offense, based only on the legal name of the offense, and the disposition that was made for the offense. As a result of this study[30] it was determined, for example, that an offense of Homicide would be assigned a weight that was approximately five times greater than the weight assigned to an offense of Assault and Battery (a B weight of 1.34 vs. A B weight of .272). It was also found by these same investigators that, when the conviction and disposition information was suppressed and not made available to a group of raters, the ratings derived from the new shorter simplified procedure had a correlation of ''r'' = .82 with original ratings based on the more complete information (which included the legal names of offenses, and the convictions and dispositions).[30]

The formulas for deriving the total score, for violent offenses according to this method, was: 1 point was scored for each ''Assault'' and ''Gang fighting'' offense; 1 1/2 points for each ''Weapons'' offense; 2 points for each ''Robbery'' offense; 3 points for each ''Arson,'' ''Rape/Indecent Assault,'' and ''Reckless Endangerment'' offense; and 5 points for each ''Homicide/Manslaughter'' offense.

The Statistical Data Analyses. Nine partial correlation analyses were required to be constructed, one for predicting from the degree of use of

each of nine different types of substances, while controlling at the same time for the degree of use of the eight other types of substances.

The control variables, or co-variates, that were entered into the analyses were for the purpose of eliminating, at least in part, the effects on violent behavior of those factors or influences common to both drug use and violent behavior. For example, for determining whether a greater degree of lifetime alcohol use, was significantly associated with involvement to a greater degree in the various types of violent behavior, the partial correlation analysis was constructed as follows: The score for the use of alcohol, lifetime, was the key independent predictor variable in this particular analysis. The eight dependent outcome variables were the scores for the number of times that each of the eight types of illegal violent offenses was committed, up to age 26 1/2. The blocks of control variables that were entered were: (1) the twelve scores for the NCPP childhood variables that had been found to predict significantly to the total score for violent behavior; (2) the four variables in school adjustment and performance from the school district files; (3) the scores for the degree of use of each of the eight other types of substances; (4) the ''Whether It's Wrong'' inventory score; the score for hyperactive, impulsive and aggressive behavior measured by the ''HK-MBD Checklist''; and the score for ASP behavior up to age 15; (5) the 13 variables for measuring self-reported school behavior problems and associations with delinquent peers, up to age 16; (6) the nine variables on family problems, up to age 16 (e.g., whether any family member had a drug or alcohol problem, or an illegal offense problem, etc.); (7) the scores for the MMPI Lie scale and the Crowne-Marlowe Social Desirability Scale; and (8) the following demographic variables: age, amount of legal annual income, whether on welfare, and level of occupation of the head of the subject's household. It was considered potentially useful to control for the amount of legal income because low income subjects who need money to buy drugs may have a greater degree of motivation for engaging in drug trafficking. There were, in all, 51 variables entered as controls, or as co-variates, in each of the nine partial correlation analyses that were constructed for determining the relationship of the degree of use of each type of drug with the frequency of involvement in each type of illegal violent behavior.

The relationship between the types of drugs used by the subjects, with the degree of their involvement in drug sales/trafficking was

determined by an additional series of partial correlation analyses constructed as follows: the measure for that degree of use of a particular type of drug was the predictor variable, and the number of days, lifetime, that the subject had engaged in drug selling was the dependent outcome variable. The same 51 variables listed above as control variables in the analyses for predicting to violent offenses, were again entered as control variables into this partial correlation analyses.

RESULTS

As shown in Table 4, the most frequent types of violent acts or offenses engaged in were ''Assaults'' and ''Weapons Offenses.'' The females reported approximately one-third as many assaults as the males; but, unexpectedly, the females reported almost three-fourths as many weapon's offenses. However, some of this may have been exclusively for self-defense. Overall, these data give the impression of a great deal of violent illegal behavior, particularly in consideration of the fact that the males reported an average of 3.6 incidents of ''Attempted Homicide/Reckless Endangerment,'' and an average of 3.5 incidents of robbery, involving the use of a weapon.

As shown in Table 5, cocaine/crack use has the highest degree of association to involvement in drug trafficking (partial r = .26, p .01). Marijuana use has the second highest association to drug trafficking

TABLE 4. The Mean and Standard Deviations, by Gender, of the Numbers of Offenses Reported for Each Type of Violent Offense

	Males (N = 306)		**Females (N = 306)**	
	Mean	**S.D.**	**Mean**	**S.D.**
Assault	24.1	32.5	8.4	18.8
Gang (Drug War) Fighting	6.4	18.9	.93	8.3
Weapons Offense	29.5	43.7	21.5	40.5
Robbery	3.5	15.9	.39	5.8
Rape	.17	2.9	–	–
Arson	.45	4.4	.02	.17
Attempted Homicide	3.6	11.5	.68	6.44
Homicide	.04	.31	.01	.18

TABLE 5. The Relationship of the Degree of Use of Each of Ten Types of Drugs with the Degree of Involvement in Drug Sales/Trafficking[1] (N = 612)

Type of Drug	Partial Correlation Values, with Frequency of Drug Sales/Trafficking
Alcohol	**.13***
Marijuana	**.17***
Amphetamines	**– .04**
Barbiturates	**.06**
Tranquilizers	**.02**
Cocaine/Crack	**.26***
Heroin	**.05**
Opiates	**– .01**
PCP/Hallucinogens	**– .01**
Non-Prescription Drugs	**– .03**

[1]The social/economic variables controlled for in this analysis were: (1) Total legal income for the past year; (2) whether parents were on welfare in the past year; and (3) occupation of the head of household.
* Indicates a significant partial correlation value at the .01 level of confidence or better.

(partial $r = .17$, $p \leq .01$); and the degree of use of none of the other types of drugs has a significant relationship to degree of involvement in drug trafficking. It was not unexpected that those subjects who were more involved in use of cocaine/crack were the subjects who were most engaged in drug/sales trafficking. Less expected was the finding that the use of marijuana had the second highest degree of association with drug/sales trafficking.

The results that were developed by the main statistical analysis, constructed to show the relationships of the types of drugs used personally by the subjects with the types of violent acts they engaged in, are shown in Table 6. This statistical analysis yielded a total of 72 partial correlation values: (Eight substances $\times$ nine scores for violent offenses = 72 results). As can be seen in Table 6, 18 of these 72 partial correlation values were statistically significant at the .01 level of confidence, or better. This is clearly a greater number of significant values than would have been expected to occur by chance alone, since only two such significant findings would have been expected to occur by chance.

As can also be seen from Table 6, it was only for the degree of use of cocaine/crack that there was found a significant relationship to

TABLE 6. The Associations of the Degree of Use, Lifetime, of Each of Nine Types of Drugs, and of Alcohol, with the Degree of Eight Types of Illegal Violent Behavior (N = 612) (A Partial Correlation Analysis)

	Types of Illegal Violent Offenses								
	Robbery	**Assault**	**Gang Drug-War Fighting**	**Weapons Offenses**	**Rape**	**Attempted Homicide**	**Arson**	**Homicide**	**Total Offense Score**
Cocaine/Crack Use	---	---	.12**	---	---	---	---	.14**	.07*
Marijuana Use	---	---	---	.11**	---	.10**	---	---	.08*
Alcohol Use	---	.09*	.08*	.07*	---	---	---	---	.10**
Amphetamine Use	.21**	---	.14**	---	---	---	---	---	---
Barbiturates Use	−.12**	−.15**	−.33**	---	---	−.13**	---	---	−.12**
Tranquilizers Use	---	.11**	−.07*	---	---	---	---	---	---
Opiates Use	.13**	.14**	.36**	---	---	.11***	---	---	.11**
PCP/Hallucinogen Use	---	---	---	---	---	---	---	---	.08*

*Indicates significance at the .05 level of confidence, or better.
**Indicates significance at the .01 level of confidence, or better.

committing homicide. Opiates, other than heroin, and marijuana were the only two types of substances, the use of which was found to be associated with "Attempted Homicide/Reckless Endangerment." Amphetamine use had the highest correlation with the frequency of "Robbery" offenses.

The use of other opiates was found to have a significant association to four of the eight types of violent offenses, including having the highest degree of association to Gang (Drug War) Fighting. Thus, regular users of such opiates, from among those types of drugs analyzed, can be considered to be the most likely to engage in the more serious types of illegal violent offenses.

The lack of finding any significant relationship between the use/abuse of drugs and the commission of the offenses of rape and arson, as shown in Table 6, may simply be due to the fact that the numbers of these two types of reported offenses were too small. (As shown in Table 4, less than one percent of the sample reported committing either of these two types of violent offenses.)

In summary, the findings show that (1) the earlier use of opiates (other than heroin) has correlations with the total score for violence more significant than the correlations for alcohol use; and (2) earlier marijuana use, as well as the earlier use of opiates and cocaine/crack, was found to have a greater relationship to subsequent commission of such serious types of offenses as "Weapons Offenses" and "Attempted Homicide/Reckless Endangerment," than was found for alcohol use.

DISCUSSION

Alcohol is the substance that has most often been reported to be a predisposing factor to the commission of violent crimes. Alcohol was, however, not found in this study to be associated with the commission of such serious offenses as Attempted Homicide/Reckless Endangerment, and Weapons Offenses, to as great a degree as was found for marijuana. The earlier reported alcohol-to-violence linkage had been based, at least in part, on the disinhibiting effect of alcohol; and the violent behavior occurred while the study subjects were still under the influence of alcohol. That is a different situation from the situation that was analyzed in this study.

Also, relevant to the finding of a more serious marijuana-violence linkage compared to the alcohol-violence linkage is the fact that mari-

juana use was found to be more associated with the frequency of drug sales/trafficking than was found for alcohol use. Marijuana use was also found to have the second highest degree of association to the frequency of drug sales/trafficking, second only to the use of cocaine/crack.

The most unexpected of the findings were the significant relationships that were found between the degree of use of marijuana use and the tendency to commit the violent offenses of Attempted Homicide/Reckless Endangerment and Weapons Use. The findings that the use of marijuana is associated with drug trafficking and with the commission of serious types of violent offenses is of particular interest, because marijuana use is often thought to be a less serious problem than the use of other illicit drugs.

A finding of the Kaplan and Damphouse study,[14] referred to earlier in the introductory section of this paper, may be relevant to the understanding of this marijuana-violence linkage. They reported that the relationship between marijuana use in the 7th grade to later violent behaviors at age 26, was moderated by personality, as follows: The drug use-violence linkages were found to be larger in magnitude among individuals who in seventh grade had low antisocial personality scores, compared to those who had high antisocial tendencies. These investigators[14] suggested that disinhibition may account for such differences and that ''these well-socialized individuals, who are highly committed to the normative social order, are highly inhibited from displaying aggressiveness. The use of drugs is disinhibiting for these individuals, resulting in their being more likely to be violent later in life.''

A disclaimer, or a note of caution, is indicated against over-generalizing the findings of a linkage between marijuana use with drug selling in the inner-city and with involvement in serious types of criminal and violent behavior. These significant marijuana-violence linkages that have been found for this study sample may not apply to a representative sample of the general population. The findings presented here may be specific for the sample of this study: an inner-city, relatively low SES, African/American sample. As postulated in the introductory section of this paper, marijuana use during adolescence is fairly widespread in this study sample, especially within specific peer groups. The regular users of marijuana maintain contact with the sellers of drugs, and thus become more familiar with the criminal life style,

which may lead to a tendency to engage in drug selling themselves, and thus to a greater likelihood of committing violent illegal offenses. The drug sellers from whom they originally obtained the cocaine and other drugs during their adolescence, most likely were adolescent peers who grew up in similar circumstances to their own. The majority in the sample need the money. Some are helping their families financially with some of the money they earn from selling drugs. Thus, a peer bonding and friendship develops between the buyer/user and his drug provider. The buyer/user becomes a new seller, and eventually finds himself in circumstances in which engaging in violent illegal behavior is routine and is considered to be acceptable.

These findings on the degree of relationship of substance use to violent behavior may be somewhat inflated since we do not have available for control purposes, data on all the possible factors, in addition to substance use, that may be involved in violent behavior, (i.e., all of the relevant characteristics, behavior and life circumstances of the subjects, that predispose to violent behavior). The fact that there were available as many as 51 such relevant characteristics for use as control variables in the analyses, may be considered to be a relative strength of the study. On the other hand, it is a weakness, or a limitation of this study, that data on some of the factors or influences that are known to predispose to violent behavior were not available for the analyses. An outstanding example of such an influence is the amount of time spent during childhood and adolescence in watching TV programs and films that present violent behavior in an interesting and exciting manner. Such entertainment programs sometimes present, as heroic figures, characters who use drugs and engage in violence. In any case, the lack of more complete control data should not be a significantly greater problem for determining the effect of the use of marijuana on violent behavior, than this lack would be for the effect of the use of any other type of drug. Thus, it would not explain why the degree of marijuana use was found to have a greater degree of relationship to certain types of violent behavior, when compared to the degree of cocaine/crack use.

The findings regarding use of barbiturates are also of particular interest, in that a greater degree of barbiturate use was found to have a significant negative association with four of the eight types of violent offenses. It thus is and life circumstances of the subjects, that predispose to violent behavior). The fact that there were available as many as

51 such relevant characteristics for use as control variables in the analyses, may be considered to be a relative strength of the study. On the other hand, it is a weakness, or a limitation of this study, that data on some of the factors or influences that are known to predispose to violent behavior were not available for the analyses. An outstanding example of such an influence is the amount of time spent during childhood and adolescence in watching TV programs and films that present violent behavior in an interesting and exciting manner. Such entertainment programs sometimes present, as heroic figures, characters who use drugs and engage in violence. In any case, the lack of more complete control data should not be a significantly greater problem for determining the effect of the use of marijuana on violent behavior, than this lack would be for the effect of the use of any other type of drug. Thus, it would not explain why the degree of marijuana use was found to have a greater degree of relationship to certain types of violent behavior, when compared to the degree of cocaine/crack use.

The findings regarding use of barbiturates are also of particular interest, in that a greater degree of barbiturate use was found to have a significant negative association with four of the eight types of violent offenses. It thus is reasonable to conclude that the more one uses barbiturates, the less likely one is to commit violent offenses.

These findings also do not necessarily have any direct implications for the national debate regarding the medical use of marijuana.

CONCLUSIONS

When considering the total score representing all the types of offenses committed by the individuals in this study sample, it was found, for the type of population sampled by this study, that (1) compared to the use of alcohol, the use of heroin and of other opiates was found to be associated to a greater degree with involvement in some of the more serious violent crimes, such as Robbery, and Attempted Homicide/Reckless Endangerment; and (2) the degree of the association of the use of marijuana with the degree of seriousness of the violent behavior is approximately as great as is the association of the degree of use of alcohol, or of amphetamines with the degree of seriousness of the violent behavior. It was quite unexpected to find that heavy

marijuana users in this sample were almost as involved in drug trafficking and in violent illegal behavior as were users of cocaine/crack.

A limitation of this study is that the cause-effect relationship of the marijuana-violence linkage is not totally clear. It is possible to interpret the findings to mean that earlier tendencies to act violently influenced the subjects to use marijuana, as a form of self-medication to obtain relief from the inner tension caused by violent tendencies. Our conclusion, however, is that the earlier tendencies toward violent behavior, up to the age of 16, were controlled for fairly adequately in our analyses.

Thus, the main conclusion of this study is that those inner-city, low SES African-American young adults, who tend to use relatively more marijuana also tend to become more involved later on in selling drugs and in violent illegal behavior. This marijuana-violence linkage is conceptualized by us as a socioeconomic and environmental influence, rather than as a biochemical effect. These findings on the relationship of the use of marijuana to violent behavior, might not apply to a middle-class African-American population.

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