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THE ASSOCIATION OF MARIHUANA SMOKING WITH OPIATE ADDICTION IN THE UNITED STATES

JOHN C. BALL, CARL D. CHAMBERS AND MARION J. BALL

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A national sample of 2,213 addict patients was employed by the authors to study the association between marihuana smoking and the subsequent use of opiate drugs. A relevant typology was delineated.

It was found that there is a positive association between marihuana and opiate use in 16 states, the District of Columbia, and Puerto Rico. In 12 other states, most of the opiate addicts had never used marihuana. These alternative patterns of drug use were related to demographic factors: residence in SMSA's, state, sex, race and age. A within area comparison of marihuana users with non-users revealed that the former addicts were significantly more deviant on most dependent variables: arrest record, early arrest, earlier onset of opiate use, intravenous administration, heroin use, and obtaining drugs from underworld sources.

This research report is a revised version of a paper presented at the annual meeting of the American Sociological Association in August, 1967.

The question has been repeatedly raised as to whether the smoking of marihuana cigarettes leads to opiate addiction in the United States.¹ Extreme viewpoints have been advanced. Marihuana use has been viewed as an insidious and invariant precursor of opiate addiction and enslavement.² Conversely, it has been regarded as an innocuous narcotic with beneficial social qualities.³ These extreme positions may now be dismissed as polemical statements without substantiation.⁴ Still, the question remains: To what

extent and under what conditions is marihuana smoking associated with a subsequent addiction to opiates?

The logical possibilities with respect to the association of marihuana and opiate drugs may be depicted as shown in Figure 1.

Box 1 includes users of both marihuana and opiates; Box 2 those who use opiates but not marihuana; Box 3 those who only use marihuana; and Box 4 consists of those who use neither marihuana nor opiates. The nondrug using population—the normal or control comparison—is found in Box 4 which, presumably, includes the major portion of the United States population. The question of association involves Boxes 1, 2 and 3. The opiate only category, Box 2, is relevant as it indicates no association between marihuana and opiates, as does Box 3, the marihuana only category. Thus, a positive association is found only in Box 1.

¹ For a recent discussion of this issue see the Report by the President's Commission on Law Enforcement and Administration of Justice, *The Challenge of Crime in a Free Society* (Washington: U.S. Government Printing Office, 1967) 224-225. A definitive bibliography on marihuana has recently been compiled, United Nations, Economic and Social Council, Commission on Narcotic Drugs, *The Question of Cannabis: Cannabis Bibliography* (E/CN.7/479, September 15, 1965).

² ANSLINGER & TOMPKINS, *THE TRAFFIC IN NARCOTICS* 20-22 (1953).

³ SOLOMON (Ed.), *THE MARIHUANA PAPERS* xiii-xxi (1966).

⁴ The smoking of marihuana cigarettes does not necessarily lead to opiate addiction (this report, Tables 1-3); conversely, use of marihuana is not without unpleasant or adverse effects for some persons. On

this latter point see, Mayor's Committee on Marihuana, *The Marihuana Problem in the City of New York* (Lancaster, Pennsylvania: The Jaques Cattell Press, 1944), p. 38; also see Howard Becker's case report of adverse effects, *Becoming a Marihuana User*, 59 AMER. J. Soc. 241 (1953).

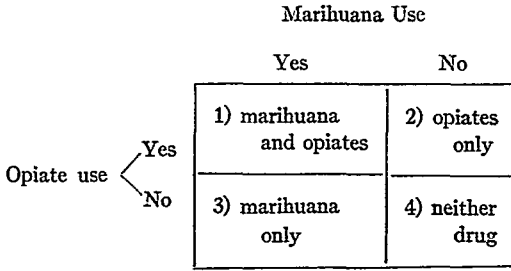


FIGURE 1

There are two principal ways of considering the association of marihuana and opiate use. The first is an epidemiological or community approach: to determine the prevalence of marihuana use in a given population, such as a city or state, and then to record the prevalence of opiate use within the marihuana group as well as in the population selected. This community based approach has been effectively employed in St. Louis by Robins and Murphy.⁵ It is pertinent to note that such epidemiological studies take a broad view of the question from the community level to the target subjects—the telescope is focused upon the community.

The second general approach in considering the association of marihuana and opiate use is to focus upon the target subjects themselves, to start with the positive association. This has been a traditional method in both medicine and sociology: to study the clinical disease state or the deviant individual. In the present study, this second approach is employed. Analysis of a national sample of opiate addicts was undertaken in order to ascertain whether or not marihuana smoking was associated with their addiction—the telescope was focused upon the target subjects.

Because of the current interest in the topic of marihuana use in the United States and the concomitant confusion as to popular versus scientific sources of data, it may be pertinent to state explicitly the scope and purpose of this paper. The precise research question under investigation is: Given existing social conditions and laws, is the smoking of marihuana in the United States associated with the subsequent use of opiate drugs? If so, under what conditions? If not, under what conditions?

⁵ Robins & Murphy, *Drug Use in a Normal Population of Young Negro Men*, 57 AMER. J. PUBLIC HEALTH 1580-1596 (1967).

SUBJECTS AND SOURCE OF DATA

The subjects were 2,213 addict patients admitted to the Lexington and Fort Worth hospitals during 1965.⁶ The demographic characteristics of this national patient sample have been previously described.⁷ The probable representativeness of the 50,070 addicts who have been admitted to the two hospitals since 1935 with respect to the universe of opiate addicts in the United States has also been considered.⁸ It is relevant to note in the present context that the addict patients at the two federal hospitals do not consist of a lower-class homogeneous prisoner population. Thus, the 2,213 addicts included both voluntary admissions and federal prisoners, males and females, Negroes and whites, laborers and housewives, prostitutes and physicians, lawyers and forgers, and drug sellers as well as users. Forty-six of the fifty states were represented and the range in age was from 16 to 75 years. In sum, this hospitalized population reflects the diverse sub-groups which comprise the universe of known opiate addicts in the United States.⁹

The principal source of data was the admission summary sheet completed by a clerk at the time each patient enters the hospital. Further information was available from patients' medical records; this included a medical history, current drug diagnosis, psychiatric diagnosis, employment experiences, criminal history, family relationships, educational records and other varied clinical and administrative documents. An extended interview was conducted with 337 of the subjects at the Lexington hospital in 1965 to secure additional information related to drug use.¹⁰ From these interviews a reliability check of the admission data was undertaken.¹¹

⁶ The 2,213 subjects included all addict patients admitted to the Lexington hospital from February 1, 1965 through December 31, 1965 and those admitted to the Fort Worth hospital from April 20, 1965 through December 31, 1965.

⁷ Ball, O'Donnell & Cottrell, *Selected Social Characteristics of Consecutive Admissions to Lexington in 1965*, 4 CRIMINOLOGICA 13-16 (1966).

⁸ Ball, *Two Patterns of Narcotic Drug Addiction in the United States*, 56 J. CRIM. L., C. & P. S. 210 (1965); Ball & Bates, *Migration and Residential Mobility of Narcotic Drug Addicts*, 14 SOCIAL PROBLEMS 67-68 (1966).

⁹ O'DONNELL & BALL (Eds.), *NARCOTIC ADDICTION* 9-10 (1966).

¹⁰ During 1965, 337 Lexington patients were interviewed by the staff of the Addiction Research Center. A detailed occupation and addiction history was obtained for each patient.

¹¹ At the time of hospital admission a clerk asked

Early in 1965, additional information with respect to marihuana use, age at first arrest, and age at first opiate use became available on all new admissions to the two federal hospitals.¹² Specifically, each patient was asked (1) whether he had ever used marihuana, (2) at what age he was first arrested, (3) at what age he first used opiates, (4) present drug used, (5) method of administration, and (6) from whom drugs were obtained. The present study is focused upon an analysis of these six items from the revised admission summary sheet, although reference is made to other sources of data as seems appropriate.

THE DISTRIBUTION OF MARIHUANA USE IN THE UNITED STATES

In Table 1, the percentage of subjects with and without a history of marihuana use is tabulated for each state. Three types of conditions were found to exist with respect to marihuana and opiate use in the United States (Figure 2). First was the positive association between marihuana and opiate use found in 16 states, the District of Columbia and Puerto Rico. In each of these high addiction states,¹³ more than 50 percent of the subjects have used marihuana as well as opiates. The 16 "marihuana states" consist of two contiguous sets. Five of the marihuana states border on Mexico or the Gulf of Mexico: California, Arizona, New Mexico, Texas, and Louisiana. The other 11 marihuana states are located in the Eastern-Midwestern metropolitan belt, on the Atlantic from Boston to New York to Washington, D. C. and westward from Pittsburgh to Chicago to St. Louis. Included within this grouping of states are the District of Columbia and Puerto

each subject whether he had ever used marihuana. Subsequently, during the detailed interview by staff he was also asked whether he had ever used marihuana. Of the 337 subjects, 30 changes in use were reported: 19 reported use to the interviewer after having answered "no use" to the admission clerk, while 11 denied use after having answered "yes" to a history of marihuana use. Thus, 5.6 percent of the 337 subjects reported more use of marihuana to the interviewer and 3.3 percent reported less use. In sum, there was a 2.4 percent net increase. Reliability of the item response was 91.7 percent. For an analysis of the reliability of 20 items contained in the patients' records, see Emily S. Cottrell, *Reliability of Admission Data*, Working Paper, Addiction Research Center, SS 67-1.

¹² For comparative data from 1936-1937, see Michael J. Pescor, *A Statistical Analysis of the Clinical Records of Hospitalized Drug Addicts*, PUBLIC HEALTH REPORTS, Supplement No. 143, 1-30 (1938).

¹³ O'DONNELL & BALL, *op. cit. supra* note 9, at pp. 8-9.

Rico.¹⁴ (The marihuana states are those with ruled lines on map in Figure 2.)

A second type of association is found in 12 states wherein most of the opiate addicts have never used marihuana. These "opiate only states" (shown by dots in Figure 2) are found in the South and constitute a regionally based area from Miami to Oklahoma to Virginia. In previous research,¹⁵ the pattern of drug abuse in these states has been referred to as the "southern pattern" of opiate addiction in the United States. It involves the use of opiates other than heroin and it is not associated with marihuana use.

The third condition, or type of association, shown in Figure 2 is that of low addiction states with or without marihuana use. The 22 states shown in white are low addiction areas on the basis of admissions to the Lexington and Fort Worth hospitals in 1965.¹⁶ Most of these states also have low rates of opiate addiction as computed from the active file of the Federal Bureau of Narcotics.¹⁷ Previous analyses of rates of opiate addiction by state generally confirm the present contiguous groupings, although some changes in rates and rank order for particular states occur.¹⁸

There are, then, two quite distinct patterns of opiate use in the United States. The first pattern of addiction is associated with marihuana use and is concentrated in the metropolitan states—New York, Illinois, California and Texas. The second pattern of opiate use is that found in the Southern states and it is not associated with marihuana smoking. The question arises as to why marihuana use is associated with the one pattern of opiate addiction, but not the other?

HIGH ADDICTION STATES WITH AN ILLICIT-DRUG SUBCULTURE

In the metropolitan centers in which marihuana and heroin use are prevalent, an illicit-drug subculture exists. Marihuana smoking and heroin use can only be steadily pursued in an environment in which there is continuous contact with underworld sources of supply, since neither drug can be legally prescribed nor dispensed in the United States. Although the structure and

¹⁴ Puerto Rico, although not contiguous to these states, is closely tied to the East Coast by virtue of migration and rapid air transportation.

¹⁵ Ball, *op. cit. supra* note 8 at pp. 203-211.

¹⁶ Table 1.

¹⁷ O'DONNELL & BALL, *op. cit. supra* note 9.

¹⁸ Ball, *op. cit. supra* note 8, at p. 207.

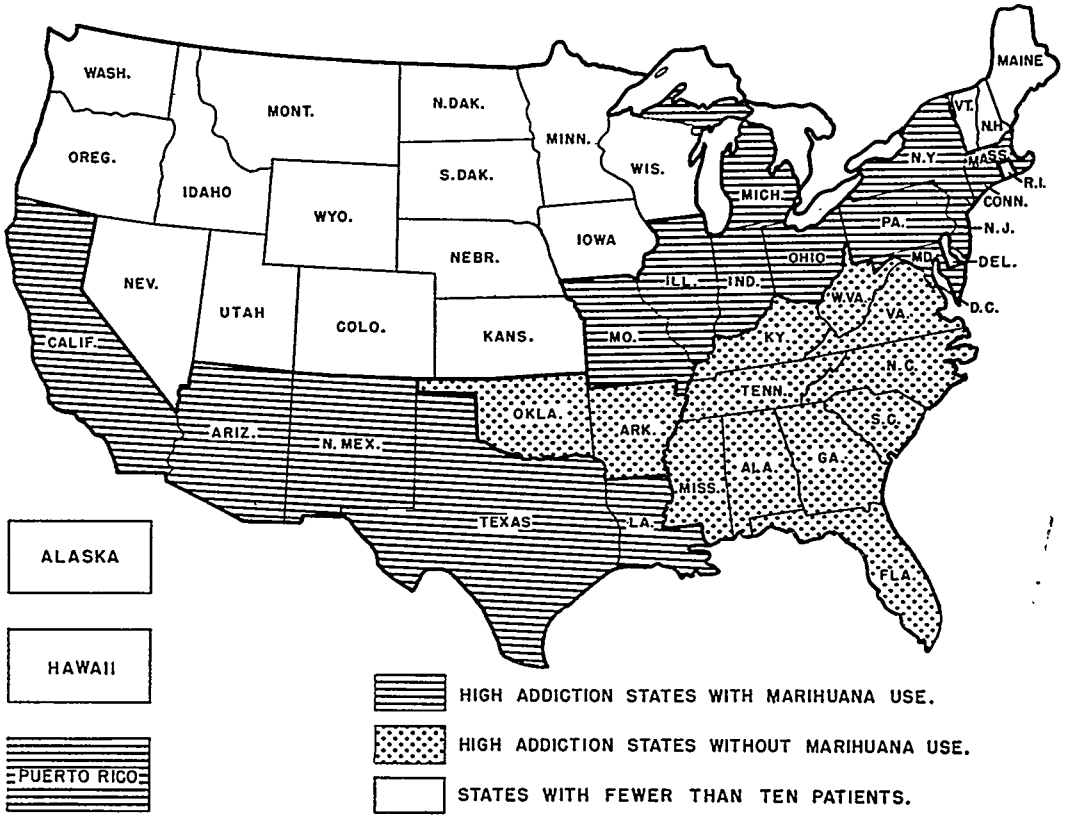
TABLE 1
STATE* OR PLACE OF RESIDENCE OF 2,213 ADDICT PATIENTS BY SELECTED DEMOGRAPHIC AND DRUG HISTORY FACTORS

Residence	Demographic Factors							Addiction Factors				Mean Age			
	Male Number	Female Number	Total Number	1st Adm. %	Vol. Adms. %	From SMSA %	Non-White %	With Arrest History %	Marihuana History %	Heroin Drog. %	Intra-venous Route %	Drugs From Pusher %	First Arrest	1st Opiate Use	All Hosp. Adm. in 1965
1. Alabama	47	13	60	56.7	95.0	58.3	6.7	63.3	20.0	1.7	55.0	28.3	20.8	29.5	39.2
2. Arizona	18	1	19	73.7	78.9	100.0	5.3	94.7	68.4	84.2	84.2	73.7	17.2	21.5	29.9
3. Arkansas	7	3	10	70.0	100.0	30.0	10.0	30.0	10.0	0.0	50.0	0.0	31.3	35.2	47.3
4. California	135	5	140	82.1	43.6	98.6	9.3	96.4	92.1	93.6	95.0	93.6	17.0	20.7	30.8
5. Colorado	6	3	9	100.0	88.9	100.0	11.1	88.9	88.9	66.7	88.9	77.8	15.1	22.3	27.8
6. Connecticut	32	0	32	78.1	96.9	100.0	25.0	100.0	75.0	78.1	90.6	90.6	18.9	19.1	25.7
7. Delaware	1	1	2	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	19.5	19.0	30.5
8. Dist. of Columbia	50	12	62	71.0	12.9	100.0	95.2	100.0	77.4	95.2	98.4	96.8	20.1	21.3	31.1
9. Florida	23	11	34	76.5	100.0	85.3	5.9	61.8	44.1	11.8	47.1	35.3	24.6	29.0	39.7
10. Georgia	49	26	75	54.7	100.0	80.0	9.3	78.7	24.0	4.0	49.3	24.0	23.8	28.8	38.8
11. Idaho	1	0	1	100.0	100.0	0.0	0.0	100.0	0.0	0.0	0.0	0.0	20.0	29.0	40.0
12. Illinois	177	58	235	52.8	77.4	99.6	58.3	90.2	82.6	76.6	90.2	83.8	19.2	21.5	31.8
13. Indiana	44	5	49	57.1	69.4	89.8	42.9	85.7	69.4	42.9	69.4	61.2	19.0	23.7	37.5
14. Iowa	1	0	1	100.0	100.0	100.0	0.0	100.0	0.0	0.0	0.0	0.0	40.0	20.0	42.0
15. Kansas	3	0	3	66.7	100.0	33.3	0.0	100.0	66.7	33.3	100.0	33.3	25.3	26.3	48.3
16. Kentucky	31	6	37	62.2	97.3	45.9	5.4	75.7	32.4	0.0	43.2	27.0	21.8	33.0	42.5
17. Louisiana	36	5	41	73.2	73.2	87.8	43.9	85.4	70.7	70.7	80.5	73.2	20.1	22.5	31.5
18. Maine	1	0	1	100.0	100.0	100.0	0.0	100.0	0.0	0.0	0.0	0.0	23.0	27.0	47.0
19. Maryland	38	5	43	72.1	86.0	100.0	34.9	100.0	83.7	86.0	95.3	95.3	17.6	20.0	27.7
20. Massachusetts	16	2	18	88.9	77.8	100.0	33.3	94.4	66.7	55.6	55.6	55.6	18.2	21.8	32.4
21. Michigan	28	10	38	68.4	89.5	86.8	36.8	73.7	60.5	36.8	57.9	36.8	21.5	25.1	35.7
22. Minnesota	5	0	5	100.0	100.0	100.0	0.0	100.0	60.0	0.0	100.0	40.0	16.4	18.6	22.8
23. Mississippi	12	3	15	66.7	100.0	20.0	0.0	66.7	33.3	0.0	60.0	40.0	22.5	28.5	42.3
24. Missouri	70	12	82	81.7	84.1	96.3	84.1	95.1	87.8	84.1	89.0	85.4	16.5	20.2	31.5
25. Montana	1	2	3	100.0	100.0	33.3	0.0	33.3	33.3	33.3	66.7	33.3	18.0	37.3	44.0
26. Nebraska	1	0	1	100.0	100.0	100.0	0.0	100.0	0.0	0.0	0.0	0.0	25.0	21.0	31.0
27. Nevada	4	1	5	80.0	80.0	100.0	20.0	100.0	100.0	80.0	80.0	100.0	17.8	22.4	26.6
28. New Jersey	64	6	70	77.1	87.1	94.3	37.1	88.6	82.9	87.1	85.7	90.0	18.3	20.5	27.8
29. New Mexico	30	3	33	72.7	69.7	81.8	0.0	93.9	81.8	87.9	87.9	87.9	15.1	20.1	26.9

30. New York	371	53	424	55.2	75.5	99.8	42.7	91.3	85.6	92.5	91.3	94.6	19.4	19.3	29.0
31. North Carolina	34	10	44	34.1	97.7	36.4	2.3	79.5	22.7	0.0	54.5	22.7	24.4	30.0	45.8
32. North Dakota	1	1	2	100.0	100.0	0.0	0.0	100.0	100.0	0.0	100.0	0.0	15.5	20.5	29.0
33. Ohio	47	16	63	55.6	87.3	81.0	44.4	81.0	55.6	25.4	55.6	34.9	21.1	25.5	38.3
34. Oklahoma	17	4	21	47.6	90.5	61.9	4.8	76.2	42.9	14.3	52.4	38.1	19.9	24.4	39.1
35. Oregon	4	2	6	100.0	83.3	83.3	16.7	100.0	66.7	66.7	83.3	83.3	19.6	21.3	26.2
36. Pennsylvania	48	7	55	63.6	87.3	96.4	60.0	83.6	72.7	67.3	81.8	69.1	17.8	22.7	35.0
37. Rhode Island	1	1	2	100.0	50.0	100.0	50.0	100.0	100.0	100.0	100.0	100.0	19.5	18.5	30.5
38. South Carolina	12	5	17	58.8	100.0	41.2	0.0	52.9	11.8	5.9	35.3	23.5	27.1	35.2	46.2
39. Tennessee	31	10	41	63.4	92.7	56.1	2.4	65.9	9.8	0.0	31.7	12.2	24.5	30.1	40.9
40. Texas	204	20	224	73.7	74.1	96.4	6.3	96.0	69.2	82.1	87.5	83.5	17.9	21.6	30.2
41. Utah	3	1	4	100.0	100.0	75.0	0.0	75.0	25.0	25.0	25.0	50.0	11.0	20.5	27.5
42. Virginia	18	3	21	61.9	95.2	52.4	4.8	81.0	42.9	9.5	61.9	23.8	19.7	25.9	37.6
43. Washington	5	4	9	77.8	100.0	100.0	44.4	88.9	77.8	22.2	88.9	55.6	18.1	23.0	33.3
44. West Virginia	11	4	15	33.3	100.0	33.3	6.7	60.0	13.3	0.0	66.7	33.3	22.2	32.5	48.7
45. Wisconsin	2	0	2	100.0	100.0	50.0	50.0	100.0	100.0	50.0	50.0	50.0	17.0	21.0	37.0
46. Wyoming	2	0	2	100.0	50.0	0.0	0.0	50.0	50.0	50.0	50.0	50.0	32.0	44.5	49.5
47. Hawaii	1	0	1	0.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	25.0	15.0	40.0
48. Puerto Rico	123	8	131	75.6	95.4	90.1	20.6	74.0	93.9	100.0	96.2	100.0	20.6	19.0	25.8
49. Foreign	4	1	5	100.0	20.0	—	0.0	100.0	60.0	100.0	100.0	100.0	14.8	18.2	30.8
Total: Percent or Mean	84.5	15.5	100.0	65.3	78.9	88.8	31.8	86.8	70.4	67.1	80.5	74.0	19.3	22.5	32.4
Total Number	1,870	343	2,213	1,445	1,746	1,961	703	1,921	1,558	1,486	1,781	1,637	1,916	2,211	2,213

* There were no admissions from four states: New Hampshire, South Dakota, Vermont, and Alaska.

HIGH OPIATE ADDICTION STATES, WITH AND WITHOUT MARIHUANA USE,
FOR 2,208 PATIENTS FROM LEXINGTON AND FORT WORTH HOSPITALS, 1965.



(SOURCE: Table 1)

FIGURE 2

dynamics of the addict subculture as an enduring group and cultural process, as distinct from an individual and psychological experience, has still to be adequately investigated, some of the basic facets are well known. The importance of learning to smoke marihuana¹⁹ or to use a needle when injecting heroin,²⁰ the dominant influence of the adolescent peer-group in the commencement of drug use,²¹ the association of opiate addiction with crime,²² the difficulty of rehabilitation,²³

and the high death rate among addicts have all been described.²⁴ In the present analysis, the intent is to delineate some of the relevant characteristics of addicts who inhabit the illicit-drug world, contrast them with what may be termed licit-opiate addicts, and consider the probable significance of marihuana use among these two types of addicts.

In 16 states, the District of Columbia and Puerto Rico, most of the addicts had a history of marihuana use and were also diagnosed as dependent upon heroin at hospital admission in 1965. There

¹⁹ Becker, *op. cit. supra* note 4, at pp. 235-242.
²⁰ Ball, *The Onset of Heroin Addiction in a Juvenile Population: Implications for Theories of Deviancy*, paper read at the annual meeting of the American Sociological Association, August 31, 1966, p. 4.

²¹ CHEIN, GERARD, LEE & ROSENFELD, *THE ROAD TO H Ch. 5* (1964).
²² Finestone, *Narcotics and Criminality*, 22 *LAW & CONTEMP. PROB.* 69-85 (1957); O'Donnell, *Narcotic Addiction and Crime*, 13 *SOCIAL PROBLEMS*, 374-385 (1966).

²³ U. S. Department of Health, Education and Welfare, *Rehabilitation in Drug Addiction* (Washington: U. S. Government Printing Office, Revised 1964).
²⁴ O'Donnell, *A Follow-Up of Narcotic Addicts: Mortality, Relapse and Abstinence*, 34 *AMER. J. ORTHOPSYCHIATRY* 948-954 (1964); Helpern & Yong-Myun Rho, *Deaths From Narcotism in New York City*, 66 *NEW YORK STATE J. MEDICINE* 2391-2408 (1966).

TABLE 2

ADDICTS FROM 16 MARIHUANA AND OPIATE STATES* COMPARED** WITH ADDICTS FROM 12 OPIATE ONLY STATES ON SELECTED DEMOGRAPHIC AND DRUG HISTORY CHARACTERISTICS (N = 2,149)

Characteristic	Addicts from 16 Marihuana and Opiate States (N = 1,759)		Addicts from 12 Opiate Only States (N = 390)	
	Number	Percent	Number	Percent
A. Demographic				
1. Male.....	1,531	87.0	292	74.9
2. Non-White.....	670	38.1	21	5.4
3. Residence in SMSA in 1965.....	1,692	96.2	222	56.9
B. Addiction and Criminality				
4. History of Marihuana Use.....	1,415	80.4	99	25.4
5. History of Arrest.....	1,590	90.4	272	69.7
6. Heroin Diagnosis, 1965.....	1,441	81.9	14	3.6
7. Use of Intravenous Route, 1965.....	1,543	87.7	189	48.5
8. Drugs Obtained from Pushers, 1965.....	1,497	85.1	100	25.6
9. Federal Prisoners, 1965.....	446	25.4	11	2.8
	Number	Mean Age	Number	Mean Age
C. Mean Age at,				
10. First Arrest.....	1,588	18.7	271	23.0
11. Onset of Opiate Use.....	1,759	20.9	390	29.8
12. Hospital Admission in 1965.....	1,759	30.4	390	41.3
13. Of First Admissions, in 1965.....	1,166	28.6	220	37.0

* Includes the District of Columbia and Puerto Rico, see text.

** For all 13 characteristics, highly significant differences were found between the residents of the two sets of states ($P < .001$). Characteristics 1-9 were compared by chi square test, the mean ages by t-test.

was, then a close association between the use of the two illicit drugs, marihuana and heroin, among residents of the marihuana states. Of the 2,213 addicts,⁸ 1,759 were residents of these 16 states, the District of Columbia and Puerto Rico, and of these addicts 80 percent had used marihuana and 82 percent were heroin users.

The concentration of the addicts from the marihuana states in metropolitan areas was marked. Over 59 percent of the 1,759 addicts were from the 12 largest Standard Metropolitan Statistical Areas in the United States; only 3.8 percent lived outside of SMSA's.

With respect to sex, race and age, the addict residents of the marihuana states were 87 percent male, 38 percent non-white and had a mean age of 30.4 years in 1965 (Table 2). The significance of minority group status is under-represented by the non-white percentage as this does not include the Puerto Rican and Mexican-American addicts.

The extent of involvement by these metro-

politan addicts in the illicit-drug subculture is seen from the data on criminality and addiction history. Over 90 percent of the 1,759 addicts from the marihuana states had been arrested; the mean age at time of first arrest was 18.7 years. In 1965, 25 percent of these addicts were federal prisoners at Lexington or Fort Worth, while many of the voluntary admissions were under legal pressure from local authorities.²⁵

The mean age at onset of opiate use for these 1,759 metropolitan addicts was 20.9 years. The dominant opiate used in 1965 was heroin, by 82 percent of the addicts, and it was commonly (by 85 percent) procured from underworld peddlers. The intravenous route of administration was utilized by 88 percent of these addicts. In sum, these young adults had had an early involvement in both delinquency and marihuana use before

²⁵Levine & Monroe, *Discharge of Narcotic Drug Addicts Against Medical Advice*, 79 PUBLIC HEALTH REPORTS 13-18 (1964).

they became further enmeshed in the illicit-drug subculture to the extent of using opiates.

The question of the sequence of events—marihuana, delinquency, opiate use—requires elaboration. From interviews with 337 patients, a stratified sample of the 2,213 subjects, it was found that the dominant sequence of events as determined from mean ages was marihuana smoking, arrest and then opiate use. The respective mean ages for these three events were: first marihuana use at 17, arrest at 19, and onset of heroin use at 20.²⁶

For the entire 16 marihuana states, the District of Columbia and Puerto Rico, the mean age at first arrest was less than the mean age of first opiate use in 13 of the states and the District of Columbia; in the case of New York it was 19 years for both and in Puerto Rico it was reversed (Table 1). A separate analysis of sequence by the 1,755 individuals supported the finding based on means.²⁷

HIGH ADDICTION STATES WITH A LICIT-DRUG SUBCULTURE

The 12 states shown in the "dotted" areas of Figure 2 are high addiction states in which less than 50 percent of the patients had a history of marihuana use. These southern, or opiate only states have a licit-drug subculture in the sense that legally manufactured drugs, such as morphine, dilaudid and paregoric, are used and these are not secured from underworld sources of supply. In these states, then, a quite different pattern of drug abuse obtains—and neither marihuana nor heroin use is prevalent.

The southern "opiate only" pattern of addiction is less markedly a metropolitan phenomenon than within the marihuana states. Although 57 percent of the 390 addicts were residents of SMSA's, in 6 of the 12 states more than half of the addicts

²⁶ Of the 337 addicts in the stratified sample, complete sequential data was available on 210; the principal reason for omissions were no arrest or no marihuana use, particularly among the 167 females included in this sample. Of the 210 addicts, 182 (87 percent) had used marihuana before opiates and 28 (13 percent) had first used it after the onset of opiate use. With respect to the sequence of marihuana use and arrest, 142 (68 percent) used marihuana first, while 68 (32 percent) were arrested first.

²⁷ Of the 1,755 addicts from the 16 state "lined" area, 168 or 9.6 percent had no arrest reported (no data was available for 4 subjects). Of the 1,587 with an arrest history, 52.7 percent were arrested before the onset of opiate use, 32.8 percent used opiates before their first arrest, and 14.6 percent were arrested and started to use opiates during the same year.

were from outside SMSA's. This pattern of addiction is, then, less concentrated and less metropolitan than the illicit-drug type (Tables 1 and 2).

Of the 390 addicts from the 12 opiate only states, 75 percent were male and only 5 percent were non-white. At the time of hospitalization in 1965, their mean age was 41.3 years. This older age was not simply a result of recidivism as the age at onset of opiate use (29.8 years) and the mean age of first admission patients in 1965 (37.0 years) were both significantly older than that found among the addicts from the marihuana states (Table 2).

A markedly different type of involvement in a drug subculture is evident among the 390 addicts from the 12 opiate only states. Although from states with high addiction rates, only 3.6 percent of these Southern residents were heroin users at time of hospital admission in 1965. Further, most received their drugs from doctors or drugstores—only 26 percent secured their drugs from underworld pushers (Table 2). Also, the intravenous route of administration was employed by less than half of these addicts.²⁸

With respect to criminality, the 390 southern addicts were less likely to have an arrest history, and if arrested this occurred at a later age (23 years). Among the 70 percent who had been arrested, this event commonly preceded the onset of opiate use, although the fact that 30 percent were without an arrest should be noted. As might be expected, few of these addicts were federal prisoners—only 2.8 percent.

In these 12 opiate only states, only 25 percent of the 390 addicts had a history of marihuana use. Although by the operational definition employed marihuana use could not be prevalent in any of these states, the fact remains that there were 12 high addiction states in which marihuana use was uncommon. In addition, these same 12 states were characterized by a different pattern of sub-cultural involvement.

WITHIN-AREA COMPARISON BY MARIHUANA HISTORY

The gross differences obtained between residents of the marihuana and opiate only states,

²⁸ For a discussion of the historical development of this means of administration in the United States, see: O'Donnell & Jones, *Diffusion of the Intravenous Technique Among Narcotic Addicts in the United States*, J. HEALTH & SOC. BEHAVIOR (forthcoming).

TABLE 3

WITHIN AREA COMPARISON OF WHITE MALE ADDICTS WITH AND WITHOUT A HISTORY OF MARIHUANA USE, FOR "LINED" AND "DOTTED" STATE RESIDENTS SEPARATELY BY SELECTED VARIABLES

Comparison Groups	N	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)
		Vol. Patients in 1965, Percent	In SMSA, Percent	Arrest Before Opiate Use, Percent	Heroin Diag., Percent	Intravenous Route, Percent	Pushers as Source of Drugs, Percent	Age at 1st Arrest, Mean	Age at Onset of Opiates, Mean	Age at Hospital Admission, 1965 Mean
"Lined" States, With Marihuana History.....	764	78.3	96.3	49.7	84.9	93.7	88.9	17.7	19.1	27.8
"Lined" States, No Marihuana Use.....	206	88.3	87.9	42.6	44.7	59.2	49.5	21.1	27.2	40.2
"Dotted" States, With Marihuana History...	72	94.4	65.3	61.1	8.3	83.3	50.0	19.7	21.8	35.5
"Dotted" States, Never Used Marihuana.....	205	98.5	51.7	48.0	0.0	41.5	15.6	23.5	32.4	43.6
Statistical Test				χ^2 test				t-test		
"Lined" States Comparison: P =		< .01	< .001	< .001	< .001	< .001	< .001	< .001	< .001	< .001
"Dotted" States Comparison: P =		< .10	< .05	< .001	< .001	< .001	< .001	< .003	< .001	< .001

although important in themselves, tend to obscure the issue of the positive association of marihuana smoking with opiate addiction. In order to transcend the marked effect of region, a within-area comparison of marihuana users and non-users, controlled for sex and race, was undertaken.

Of the 970 white male addicts from the 16 illicit-drug states, 77.8 percent had a history of marihuana use and 21.2 percent had never used marihuana (Table 3). Those who had used marihuana were more likely to be metropolitan residents, arrested at an earlier age and arrested before the onset of opiate use. The 764 marihuana users were twice as likely (85 vs. 45) to be heroin addicts, to use the intravenous method of administration and to secure their drugs from underworld pushers or sellers than the 206 addicts without a history of marihuana use. In addition, the earlier age at arrest (17 years), at onset of opiate use (19 years), and of Lexington or Fort Worth hospitalization (27 years) of the marihuana group indicates that marihuana use is associated with an early age of entrance into a deviant subculture. Statistically significant differences on all nine variables between the addicts with a marihuana history from those without such a history are presented in Table 3.

There were 277 white male addicts from the 12 opiate only states. Of these, 26.0 percent had a history of marihuana use and 74.0 percent had

never used marihuana. The 72 marihuana users were more likely to be metropolitan residents, more often arrested before the onset of opiate use, and arrested at an earlier age (19 vs. 23 years). The marihuana users were more than three times as likely to be securing their drugs from pushers, and twice as likely to be taking drugs intravenously. Heroin addiction was uncommon in these 12 states, only 6 heroin users were included among the 277 addicts. As in the previous comparison within the "lined" states, the addicts with a marihuana history were notably younger at first arrest, at onset of opiate use, and at time of 1965 hospitalization (Table 3). Within the "dotted" states, then, those addicts who had a marihuana history were significantly different from those without such a history, on 8 of the 9 variables compared. These differences were often marked—age at onset of opiate use was ten years earlier for the marihuana subjects—and in all eight instances they were in the same direction as in the previous comparison within the lined states.

A similar statistical comparison between marihuana users and non-users was undertaken for the non-white and female addicts. The 703 non-white addicts were almost exclusively Negroes²⁹ from the "lined" states residing in metropolitan

²⁹ Of the 703 non-white addicts, 699 were Negro, 2 Chinese, 1 Hawaiian and 1 Philippino.

areas. Thus, the only meaningful comparison of the non-white addicts was between the marihuana users and non-users in the 16 "lined" states. There were 561 male Negro addicts from these states; 502 of this number (89.5 percent) had a history of marihuana use and 59 did not have a marihuana history. Meager but statistically significant differences between the 502 users and the 59 non-users were found with respect to: use of heroin (94 vs. 85 percent), use of the intravenous route (95 vs. 88 percent), and securing opiates from pushers (96 vs. 86 percent). More meaningful age differences between the two male Negro groups were found. Among the 502 addicts with a history of marihuana use, the mean age at first arrest was 18.5 years, mean age at onset of opiate use was 20.1 years, and the mean age at the time of hospitalization for addiction in 1965 was 30.2 years. The comparable mean ages of the 59 Negro addicts without a history of marihuana use for these three events were: first arrest 20.6 years, onset of opiates 24.0 years and current hospitalization 32.8 years; each of these age differences was statistically significant.³⁰

Of the 109 Negro females from the 16 "lined" states, 83 had used marihuana and 26 had not. All 109 subjects were residents of SMSA's in 1965. For the comparisons other than age, the only statistically significant difference was with respect to intravenous use—those with a marihuana history were more likely to be using opiates intravenously (94 vs. 73 percent). The other differences were in the same direction as reported in Table 3, although not statistically significant. With respect to the three age variables, the marihuana group was younger at first arrest (19.8 vs. 22.9 years), younger at onset of opiate use (20.2 vs. 24.1 years), and younger at time of hospitalization at Lexington (29.2 vs. 32.2).³¹

In sum, the Negro addicts who had used marihuana were notably different from those who had not by a younger age involvement in deviancy—arrest, onset of opiate use, and hospitalization for addiction. The other intergroup differences (on variables A, C, D, E and F, Table 3), even if statistically significant, were attenuated by comparison with the differences noted between the white marihuana users and non-users who were

residents of these same 16 states, the District of Columbia and Puerto Rico.

MARIHUANA USE AMONG WHITE FEMALE ADDICTS

Of the 119 white female addicts from the "lined" states, 66 had used marihuana and 53 had not. Those female addicts with a history of marihuana use were more likely than those without such a history to be metropolitan residents (97 vs. 87 percent), twice as likely to be heroin users (82 vs. 45 percent), using intravenously (85 vs. 47 percent) and securing their drugs from pushers (89 vs. 49 percent). Again, there was marked evidence of earlier involvement in deviancy among the marihuana users: mean age at first arrest (19.4 vs. 23.9), mean age at the onset of opiates (19.3 vs. 27.4), and mean age at 1965 hospitalization (26.8 vs. 35.6).³²

The female addicts from the 12 "dotted" states were less likely to have used marihuana than those from the "lined" states. Of the 92 white female addicts from the "dotted" states, only 12 had a history of marihuana use. These 12 were three times more likely to be using drugs intravenously (83 vs. 25 percent), and three times as often securing drugs from underworld pushers (50 vs. 15 percent). The two groups did not differ (in terms of statistical significance) with respect to voluntary status at the hospital, residence in SMSA, (although 75 percent of users vs. 51 percent of non-users were SMSA residents), or heroin addiction.³³ As in all previous within area comparisons, the addicts with a history of marihuana use became involved in deviancy at an earlier age than those who did not use marihuana. The mean age at first arrest for the 12 white female marihuana subjects was 23.9 years, mean age at onset of opiate use was 23.0 years, and mean age at Lexington hospitalization was 31.8 years. The comparable figures for the 80 white female addicts without a history of marihuana use from the 12 "dotted" states were: first arrest 28.9 years, onset of opiates 32.7 years, and 1965 hospitalization 43.5 years.³⁴

INTERPRETATION OF THE RESEARCH FINDINGS

Before considering the particular question of the association of marihuana use with opiate addiction

³⁰ The *t*-test probabilities were: arrest $P < .05$, onset $P < .001$, and hospitalization $P < .005$.

³¹ The probabilities were (*t*-test): $< .05$, $< .01$, and $< .08$.

³² Probabilities (*t*-test): $< .003$, $< .001$, and $< .001$.

³³ Only 3 of the 92 females were heroin users in 1965.

³⁴ Probabilities (*t*-test): $< .02$, $< .001$, and $< .001$.

in the United States, several more general points require comment. The absence of Negro addicts from the Southern states in the present national sample as well as similar findings from previous studies³⁵ supports the contention that ethnicity is an important variable with respect to addiction liability. The high addiction rates among Negroes and Puerto Ricans in northern metropolitan areas also support this contention.³⁶ It appears, however, that drug addiction as a form of deviance: (1) affects some ethnic populations more than others (the lack of opiate use among Japanese-Americans, Polish or Italian immigrants may be contrasted with the prevalence of addiction among the Chinese-Americans and northern Negroes), and (2) depends upon a suitable host environment. This latter factor accounts for the differential prevalence of addiction among Negroes in the United States. In addition to differential liability by ethnicity and host environment, opiate addiction is affected by cultural changes in a given society with the result that the prevalence of addiction with respect to specific populations and geographical designations also changes. Thus, opiate addiction among infants, females, and Chinese-Americans has markedly decreased during the twentieth century in the United States.³⁷ Conversely, addiction among young male metropolitan members of certain racial or ethnic groups has increased.³⁸

The present research findings provide inferential evidence that marihuana smoking has become more common among opiate addicts in recent years. The older age of the 655 addicts without a history of marihuana use (40.3) when contrasted with the 1,558 who had smoked marihuana (29.1) provides substance for such an interpretation. Furthermore, the absence of references to marihuana use among opiate addicts by Terry and Pellens³⁹ (1928) and Pescor's findings in 1937 that only a few Lexington patients had used marihuana before opiates seems significant when contrasted with the dominant pattern of marihuana use followed by opiate abuse reported by Fort,⁴⁰ Finestone,⁴¹ Chein,⁴² and Ball⁴³

in more recent years. The available evidence suggests, then, that marihuana smoking has increased among opiate addicts in the United States.

A further general comment concerning the significance of dependence upon specific opiate drugs is relevant. At the time of hospitalization in 1965, 1,486 of the 2,213 patients were diagnosed as heroin users. The other opiates being abused were: morphine (by 201 addicts), dilaudid (135), paregoric (131), meperidine (108), codeine (86), and the remaining 66 patients were using methadone, percodan, pantopon, opium, cocaine and numorphan. The association of heroin dependence with a history of marihuana use within each of the two regional high addiction areas has been delineated. What is not apparent, however, is the extent to which opiate use may be drug-specific for some persons. Thus, most of the 129 meperidine and methadone users have never used heroin and only 16 have ever used marihuana. The point being that within the general addict population one finds particular drug-specific behavioral patterns which appear to insulate the individual from other types of drug abuse.⁴⁴

As to the issue of association, marihuana smoking is seen as a predisposing influence in the etiology of opiate addiction in the United States. Among metropolitan residents of the high addiction eastern and western states, opiate use is commonly preceded by the smoking of marihuana cigarettes and arrest. Thus, both marihuana use and delinquency are predisposing factors within the metropolitan host environment.

But what is the relative effect of marihuana use with respect to subsequent addiction? Is it of greater import than delinquency, or an unstable home? An adequate answer to this question is not possible. Still, enough is now known about the association of marihuana and opiate use to delineate the dominant relationship of these two events.

The incipient addict is predisposed to opiate addiction by his use of marihuana for the following reasons: marihuana is taken for its euphoric effects—it produces a "high"; both marihuana and heroin are only available from underworld sources of supply; both are initially taken within a peer-group

³⁵ Bates, *Narcotics, Negroes and the South*, 45 SOCIAL FORCES, 61-67 (1966).

³⁶ Ball & Bates, *op. cit. supra* note 8.

³⁷ Ball & Lau, *The Chinese Narcotic Addict in the United States*, 45 SOCIAL FORCES 68-72 (1966).

³⁸ Chein *et al.*, *op. cit. supra* note 21, Chaps. 1-4.

³⁹ TERRY & PELLENS, *THE OPIUM PROBLEM* (1928).
⁴⁰ Fort, Jr., *Heroin Addiction among Young Men*, 17 PSYCHIATRY, 251-259 (1954).

⁴¹ Finestone, *Cats, Kicks and Color*, 5 SOCIAL PROBLEMS 3-13 (1957).

⁴² Chein *et al.*, *op. cit. supra* note 21, Ch. 6.

⁴³ Ball, *Marihuana Smoking and the Onset of Heroin Use*, paper read at the annual meeting of the Committee on Problems of Drug Dependence, National Research Council, February, 1967.

⁴⁴ RASOR & CRECRAFT, *Addiction to Meperidine (Demerol) Hydrochloride*, 157 J. AMER. MED. ASSOC. 654-657 (1955).

recreational setting; both are illegal; the neighborhood friends with whom marihuana use begins are often the same friends who initiate the incipient addict to the use of opiates. A principal effect, then, is one of differential association—becoming part of a drug-taking group.

In considering the association of marihuana and opiate use attention has been focused only upon the type 1 situation depicted in Figure 1. It

has now been shown that a type 2 situation also prevails in the United States—opiate addiction without marihuana use. It is evident that there are several patterns of behavior which lead to drug addiction. Data of the present study support the conclusion that marihuana use is closely associated with opiate addiction in the high drug use metropolitan areas of the East and West, but not associated with opiate addiction in 12 southern states.