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MENTAL DISORDER AND VIOLENT CRIME:

A 20 YEAR COHORT STUDY

Final Report

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BACKGROUND

"The issues of violence and mental disorder need to be systematically investigated to clarify ... conflicting reports and to develop information on which policy can be based" (NIJ 1987:19). While this observation could be made about many other areas of violence, it is particularly relevant to violence and mental disorder. It is especially relevant because of the paucity of prior work on this topic and because of the widely divergent approaches taken in the research that is available. As Taylor has noted specifically for schizophrenics, "There is no doubt that schizophrenics are capable of violent behavior and, there, are certainty about the relationship between schizophrenia and violence ends" (1982:269).

One of the serious difficulties in the research investigating the relationships of mental disorder to crime is the absence of direct comparisons at the same points in time in the same jurisdictions of the rates of offending of persons with and without mental disorder. There has been no test of whether mental disorder is a less important factor in arrest than the usual criminologic factors. For example, while it is presumed that both prison inmates and mental patients have high rates of subsequent offending, no study has directly compared the two groups. Even within the mental patient group there have been no consistent research findings on whether certain diagnostic groups of patients have higher rates of offending.

One of the reasons for the conflicting findings on the relationship between diagnosis and future violence may be the confounding effect of prior violence. Prior violence may have such a powerful effect on future violence that it masks the effect of other factors, such as diagnosis. In the study reported here, we directly compare for the first time long-term patterns of crime for mentally disordered patients and for prison inmates who were institutionalized at the same time in New York State. We compared subsequent crime and violence across four groups: prisoners with no mental health history, prisoners with a mental health history, patients with a prior arrest history, and patients with no prior arrests.

Our hypothesis, based on prior literature showing that criminologic variables are the best predictors of subsequent arrests, was that both prisoner groups and patients with prior arrests would have higher arrests than mental patients with no prior arrests. Our secondary interest was to assess the predictive value of a diagnosis of schizophrenia in patients controlling for arrest history to evaluate the impact of diagnosis. To assess the stability of the results over time, we collected information for patients from two time periods a decade apart and traced their arrest records for eleven years.

SAMPLE AND METHOD

This study capitalizes and builds on data collected as part of 1979-1982 LEAA/NIJ sponsored research project co-directed by Henry J. Steadman and John Monahan. That project collected data on 397 inmates admitted to New York State prisons in 1968 and 399 inmates admitted in 1978. Likewise, data were collected on 398 and 400 patients admitted to New York State psychiatric centers in 1968 and 1978 respectively. The records for these four cohorts contained information on adult arrests, incarcerations, and mental hospitalizations as to dates, types, sequence, and duration through 1978. This research described here supplemented the existing data base to provide a 20-year follow-up of the two 1968 admission cohorts and a 10-year follow-up of the two 1978 admission cohorts.

Sample Selection

Our sample included four cohorts of subjects; a prisoner cohort and a mental patient cohort each from the two time periods. Sample selection was restricted to males and was accomplished by selecting every nth name on the admission lists to bring about the desired sample size of 400 for each cohort. When the computer, nonetheless, produced a female, or other type of ineligible subject, the following name on the list was selected until an eligible subject was found. This number was chosen simply because within the LEAA study that was the most cases that could be studied with the funding available.

Sample selection did not preclude an individual from being in more than one sample (e.g., an individual could have been both a mental patient in 1968 and a prisoner in the 1978 sample), although this rarely occurred.

For the mental patient sample, specifically, all adult males under the age of 65 admitted into a New York State Psychiatric Center during the study years were eligible. The mental patient samples included: voluntary patients, involuntary civil commitments, evaluations for competency to stand trial, defendants found incompetent to stand trial, transfers from prisons and jails, and persons found not guilty by reason of insanity. Persons defined as ineligible for inclusion in the study were those patients: transferred from other state mental hospitals; admitted into special facilities for the mentally retarded or for alcoholics; admitted into the Department of Corrections (DOC) operated mental health facility; or admitted to special secure facilities operated by the Department of Mental Health (DMH).

All adult offenders admitted into New York State prisons under 65 years of age were eligible for selection in the two prisoner samples. This included inmates convicted of new offenses and inmates returned to prison for parole violation. Inmates ineligible for selection were those state prisoners transferred from another prison within the state or returned to the prison from a mental hospital. Persons charged with or convicted of crimes but only placed in city or county jails were not included in our prison population.

Data Collection

We followed all subjects for at least eleven years from their time of admission. Data were collected in three major areas: mental hospitalizations, incarcerations and arrests to supplement the existing data base. In total, the following types of data in each of these three areas were collected for all samples.

Hospitalization Histories

- Inpatient hospital in state operated mental hospitals were coded.
- Admission and discharge dates and legal status for all state hospitalizations occurring through 1988.
- Primary diagnosis for target admission and the most recent admission.
- Placements in DOC Mental Hospitals were recorded in the hospitalization history.
- All facilities used specifically for the mentally retarded or for alcoholics were excluded.

Incarceration Histories

- Only time spent in adult state prisons were recorded.
- Incarcerations through 1988 were included.
- All imprisonments not separated by a release to the community (transfers) are recorded as one incarceration period -- one date of admission and one date of release.
- Special DOC Mental Health Facilities are not recorded under incarcerations, but as mental hospitalizations.
- Due to limited availability, no out-of-state incarcerations were coded.
- Date of release refers to the date the subject re-entered the community (parole, outright release, escape).

Arrest Histories

- Arrest Histories were coded, but not conviction data.
- All arrests were coded from the first adult arrest through 1988.
- For each incident only the most serious charge was coded.
- Both in-state and out-of-state arrests were coded when available.

The arrest information on both prisoner and mental patient groups comes from the system maintained by the New York State Division of Criminal Justice Services (DCJS). Every fingerprint check by a local law enforcement authority is recorded. All FBI fingerprint checks on arrests outside of New York are also included in this system. Exactly how complete they are is not certain, but for

the most serious felonies, they are thought to be quite comprehensive. Thus, differential mobility of the cohorts that could produce differential ratios of out-of-state arrests should not be a major problem. These rap sheets were requested on an individual basis, using all available identifiers, and abstracted by project research staff.

All hospitalizations that occur in New York State Psychiatric Centers for both prisoners and mental patients were obtained from computer printouts generated by the NYS Office of Mental Health (OMH). When information was unclear or incomplete, research staff went to the central files of the OMH to abstract information. The incarceration history data were obtained from the NYS Department of Correctional Services from computer printouts (for the more recent incarcerations) and by manually conducting computer checks at the central office of DOCS and checking for each subject in off-site record storage facilities. The abstract forms used to record the data are attached as Appendix A.

In addition to these data, date of birth, race, legal status, and diagnosis were recorded. An overview of the four study groups is presented in Table 1. A crime classification sheet detailing the categories of target arrests listed on Table 1 is attached as Table 2. For our purposes in this project, violent crimes included murder, manslaughter, rape, assault, kidnapping, and sodomy.

RESULTS AND DISCUSSION

Table 3 displays the occurrence and rate of subsequent arrests and subsequent violent arrests for the four cohorts (1968 and 1978 patients and prisoners). The prisoners are significantly more likely to have subsequent arrests and subsequent violent arrests as one would expect. Patients from the 1978 cohort had a higher proportion with arrests and higher rate of arrest than the 1968 cohort. The rate of violence across all groups was very low. Time at risk represents the average number of years spent in the community (not including any hospitalizations or incarcerations).

Analysis of the data focused on the bivariate relationship of the independent variables and subsequent violence. While only had a limited number of variables were available for analysis, the results are found for the four cohorts in Table 4. We used contingency tables to test for relationships with the dichotomous variables and, because the rates were so highly skewed, the Kruskal-Wallis One-Way Analysis of Ranks Test with the rates. Table 4 displays the results. A clear pattern emerged. Among both prisoners and patients in both 1968 and 1978 cohorts, younger, non-white subjects with more extensive incarceration and arrest histories were more likely to be subsequently arrested and to be criminally violent. The one variable not often significant was prior hospitalization. Clearly, the criminologic variables were better predictors than the mental disorder variable.

Logistic regression analyses were employed to test for differences in the percentage of group members that were subsequently arrested or arrested for a violent crime. These results are reported in "Mental Illness as a Factor in Criminality: A Study of Prisoners and Mental Patients" which has been submitted for publication to Criminology (paper attached). These results indicate that there were clear distinctions among the four groups: prisoners with or without prior mental hospitalizations were the most prone to subsequent arrest and patients with no prior arrest histories were the least likely to exhibit such behavior. As hypothesized for both 1968 and 1978, prisoners with prior hospitalizations and patients with prior arrests had the intermediate levels of arrest rates, and in 1978, there were no statistically significant differences between these two groups. Finally, the difference between patients with prior arrests and other patients was greater for the 1978 cohort than the 1968 cohort.

This ordering has several implications. The typical prisoner poses a much higher risk of criminality than the typical patient. Because prisoners with prior hospitalizations routinely had rates and probabilities lower than prisoners without prior hospitalizations, there was some evidence that mentally disordered prisoners pose a slightly lower risk, but not by so much as to be statistically significant in our samples. This might suggest that the difference was due to pre-existing differences

between these groups of prisoners and/or to differences in how they are managed or treated by the criminal justice system. The ordering of the two hybrid groups has similar implications. While not often statistically significant, patients with prior arrests had lower rates and probabilities than prisoners with prior hospitalizations. And there does not appear to be support for the hypothesis that mentally disordered prisoners were a higher risk than other prisoners — if anything, they might be lower risks.

A second focus of the analyses was to examine the relationship of diagnosis, specifically schizophrenia, and subsequent violent arrest for the two patient cohorts. The results are reported in "Schizophrenia as a Risk Factor for Violence" currently under review at Nervous and Mental Disease (paper attached). When diagnosis is dichotomized (schizophrenia / not schizophrenia), patients with schizophrenia are clearly more likely to be violent than the non-schizophrenics (see Table 5). The more interesting question and the focus of this second paper was how the diagnosis of schizophrenia relates to other more criminologic predictor variables in the relationship with subsequent violence.

Our results produced a number of interesting patterns (see Table 6). For the 1968 cohort, the effect of schizophrenia on subsequent arrest for violence was significant only for patients with no prior arrests. It was not significant for other patients with prior arrest. For purposes of prediction, schizophrenia was an important risk factor (with an odds ratio of almost 10 for patients with no prior arrests) in this cohort. Based on these data, the correct procedure for prediction would have been to first ask about a patient's prior arrest history. Only if there had been no prior arrests would one, need to determine whether or not a patient was schizophrenic.

For the 1978 cohort, the results were quite different. When controlling for age, race, and legal status, schizophrenia was not a significant predictor, regardless of the prior arrest pattern. The magnitude of the effect size (a schizophrenic was approximately 1.5 times as likely to be subsequently criminally violent) was generally the same for all types of arrest histories. If schizophrenia had any

effect, it had the same effect for all history types. Both the low base rate of violence and the small sample sizes contribute to the lack of significance of the odds ratio of 1.5.

While it was true that the results of this study indicated that the patients who had previously been criminally violent were more likely to be subsequently criminally violent, the findings suggest caution in accepting the claim that risk assessment can and should only be made when extensive prior histories of violence are present. For both cohorts, patients with prior arrests for violent crimes were more likely to be subsequently criminally violent than patients with prior arrests for only non-violent crimes, but the largest different in probability of future violence was between patients with no priors and patients with priors, violent or not. The results for diagnosis in the 1968 cohort offer further evidence. A diagnosis of schizophrenia clearly was a risk marker that would merit attention in the 1968 cohort.

FUTURE DIRECTIONS

There are additional research questions which can be explored with the data from this project. The most interesting set of questions focus on the sequence of crime and mental disorder in the history of an individual. If time permits, we would like to employ event history analysis or a similar technique to look at the sequencing of events, for those persons with both arrests and hospitalizations.

Still, this data set is very limited in sample size and in the number of predictor variables available to fully examine the relationship of mental disorder and crime. For example, our data do not allow us to analyze particular facets of schizophrenia, such as thought disorders, delusions, or hallucinations. The only other variables not measuring prior histories available to us were age and race. The lack of a sufficient sample size prohibited us from disaggregating by specific arrest charge. Clearly future work demands additional comparative work with larger samples of both prisoners and mentally disordered persons, within the same jurisdictions and during the same time periods. We need better

measures of mental disorder and much greater discrimination of the types of disorder and their histories to conduct more thorough investigations of the relationship of crime and mental disorder.

REFERENCES

National Institute of Justice. Research Program Plan: Fiscal Year 1988. October, 1987.

Taylor, P. Schizophrenia and Violence. Pp. 269-844 in Abnormal Offenders, Delinquency and the Criminal Justice System ed. J. Gunn and D.P. Farrington. New York: John Wiley & Sons, 1982.

APPENDIX A

MENTAL HOSPITALIZATION HISTORY FORM

Study ID Number _____

Check here if no follow-up mental hospitalization history

Check here if outpatient history

Legal Status

- 1 = Voluntary civil admission
- 2 = Civil commitment (involuntary)
- 3 = Competency Evaluation
- 4 = Transfer from prison / jail
- 5 = Not guilty by reason of insanity
- 6 = Incompetent to stand trial
- 9 = No information

Diagnosis

Target diagnosis: _____

Most recent diagnosis: _____

Date of most recent diagnosis: _____

Any alcohol diagnosis?

Any drug diagnosis?

- 1 = Yes
- 2 = No
- 8 = Not Applicable
- 9 = No Information

	<u>Admission Date</u>	<u>Legal Status</u>	<u>Release Date</u>	<u># of days in Hospital</u>		<u>Admission Date</u>	<u>Legal Status</u>	<u>Release Date</u>	<u># of days in Hospital</u>
Target	_____	_____	_____	_____					
Follow-Ups									
1.	_____	_____	_____	_____	11.	_____	_____	_____	_____
2.	_____	_____	_____	_____	12.	_____	_____	_____	_____
3.	_____	_____	_____	_____	13.	_____	_____	_____	_____
4.	_____	_____	_____	_____	14.	_____	_____	_____	_____
5.	_____	_____	_____	_____	15.	_____	_____	_____	_____
6.	_____	_____	_____	_____	16.	_____	_____	_____	_____
7.	_____	_____	_____	_____	17.	_____	_____	_____	_____
8.	_____	_____	_____	_____	18.	_____	_____	_____	_____
9.	_____	_____	_____	_____	19.	_____	_____	_____	_____
10.	_____	_____	_____	_____	20.	_____	_____	_____	_____
					Most Recent	_____	_____	_____	_____

PRISON HISTORY FORM

Study ID Number _____

Check here if no follow-up prison history

Type of Incarceration

- 1 = New Sentence
- 2 = Return from Mental Hospital
- 3 = Parole Violation

- 4 = Return from Court Order
- 5 = Return from Absconding
- 6 = Return from Conditional Release
- 9 = No Information

	<u>Type of Incarceration</u>	<u>Admission Date</u>	<u>Release Date</u>
Target	_____	_____	_____
Follow-Ups			
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____
5.	_____	_____	_____
6.	_____	_____	_____
7.	_____	_____	_____
8.	_____	_____	_____
9.	_____	_____	_____
10.	_____	_____	_____
Most Recent	_____	_____	_____

ARREST HISTORY FORM

Study ID Number _____

Check here if no follow-up arrest history

	<u>Type of Arrest</u>	<u>Arrest Date</u>	<u>Crime Classification Code</u>
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____
5.	_____	_____	_____
6.	_____	_____	_____
7.	_____	_____	_____
8.	_____	_____	_____
9.	_____	_____	_____
10.	_____	_____	_____
11.	_____	_____	_____
12.	_____	_____	_____
13.	_____	_____	_____
14.	_____	_____	_____
15.	_____	_____	_____
16.	_____	_____	_____
17.	_____	_____	_____
18.	_____	_____	_____
19.	_____	_____	_____
20.	_____	_____	_____
21.	_____	_____	_____
22.	_____	_____	_____
23.	_____	_____	_____
24.	_____	_____	_____
25.	_____	_____	_____

	<u>Type of Arrest</u>	<u>Arrest Date</u>	<u>Crime Classification Code</u>
26.	_____	_____	_____
27.	_____	_____	_____
28.	_____	_____	_____
29.	_____	_____	_____
30.	_____	_____	_____
31.	_____	_____	_____
32.	_____	_____	_____
33.	_____	_____	_____
34.	_____	_____	_____
35.	_____	_____	_____
36.	_____	_____	_____
37.	_____	_____	_____
38.	_____	_____	_____
39.	_____	_____	_____
40.	_____	_____	_____
41.	_____	_____	_____
42.	_____	_____	_____
43.	_____	_____	_____
44.	_____	_____	_____
45.	_____	_____	_____
46.	_____	_____	_____
47.	_____	_____	_____
48.	_____	_____	_____
49.	_____	_____	_____
50.	_____	_____	_____
Target Arrest	_____	_____	_____
Most Recent Arrest	_____	_____	_____

TABLE 1

Characteristics of 1968 and 1978 Patients / Prisoners

	1968 <u>Patients</u> (N=398)	1978 <u>Patients</u> (N=400)	1968 <u>Prisoners</u> (N=397)	1978 <u>Prisoners</u> (N=398)
<u>Mean Age in Years</u> <u>at Target Admission</u>	39.2	34.4	27.7	27.7
<u>Race</u>				
White	71.1%	67.5%	49.5%	31.4%
Black	21.0%	23.7%	47.9%	51.6%
Hispanic	7.3%	7.8%	2.6%	17.0%
Other	0.6%	1.0%	0.0%	0.0%
<u>Legal Status at Target Admission</u>				
Civil				
Voluntary	53.8%	62.7%	--	--
Involuntary	44.0%	35.3%	--	--
Criminal	2.2%	2.0%	--	--
<u>Primary Diagnosis at Target Admission</u>				
Schizophrenia	40.0%	47.3%	--	--
Substance Abuse	28.0%	25.7%	--	--
Organic Brain Syndrome	20.0%	10.8%	--	--
Personality Disorders	4.3%	3.1%	--	--
Other Major Disorders	7.7%	13.1%	--	--
<u>Arrest Charge for Target Admission</u>				
Murder / Manslaughter	--	--	10.5%	9.5%
Other Violent Crimes	--	--	19.2%	21.6%
Potentially Violent	--	--	17.1%	32.4%
Other Crimes Against Person	--	--	4.2%	4.5%
Sex	--	--	0.3%	0.3%
Property	--	--	38.0%	22.6%
Drug	--	--	9.7%	8.8%
Minor	--	--	1.0%	0.3%

TABLE 2

CRIME CLASSIFICATION

Blank = No Charge

00 = No Conviction Charge (no resolution, trial pending)

01 = Parole Violation

02 = Recidivism

10 = Murder, Manslaughter, Deliberate Homicide

20 = Forcible Rape, Sexual Intercourse Without Consent (MT)

OTHER VIOLENT

- 31 = Physical Assault (e.g., Assault and Battery, Aggravated Assault)
- 37 = Assault on Police Officer / Correctional Officer
- 32 = Criminal Negligent Homicide, Vehicular Homicide
- 33 = Attempted Rape, Assault with Intent to Commit Rape
- 34 = Attempted Murder
- 35 = Non-Sexual Child Abuse, cruelty to child
- 39 = Other Violent Crimes

POTENTIALLY VIOLENT

- 41 = Kidnapping
- 42 = Arson
- 43 = Robbery
- 49 = Other Potentially Violent

SEX

- 51 = Statutory Rape (Consensual), Misdemeanor Rape
- 52 = Sodomy
- 53 = Sexual Abuse, Sexual Misconduct, Sexual Assault
- 54 = Incest
- 55 = Lewd and Lascivious Conduct
- 56 = Lewd and Lascivious with Minor
- 59 = Other Sex Crimes

OTHER CRIMES AGAINST PERSON

- 60 = Families and Children (contributing to the delinquency of a minor)
- 61 = Criminal Possession of Weapon, Carrying a Concealed Weapon (Manufacture of Explosives)
- 62 = Reckless Endangerment ("Pistol Pointing")
- 63 = Coercion
- 64 = Unlawful Imprisonment, Unlawful Restraint
- 65 = Menacing, Harassment, Verbal Assault (e.g., Simple Assault, Terroristic Threat, Intimidation)
- 66 = Hit and Run
- 67 = Other Crimes Against Person (Conspiracy, Mutiny in a penal institution)

PROPERTY

- 68 = Forged Check, Bad Check
- 69 = Bribery
- 70 = Embezzlement
- 71 = Burglary
- 72 = Criminal Mischief, Tampering, False Alarm, Vandalism
- 73 = Criminal Trespassing, Unlawful Entry
- 74 = Larceny (Grand and Petty), Theft, Shoplifting, Pickpocketing
- 75 = Forgery and Counterfeiting
- 76 = Possession of Stolen Property, Criminal Receiving
- 77 = Auto Theft, Joy Riding
- 78 = Fraud (Deceptive Practices)
- 79 = Other Property Crimes (e.g., Possession of a Forged Instrument)

DRUG

- 81 = Drug, Selling Dangerous
- 82 = Drug, Possession Dangerous
- 83 = Other Drug Crimes (possession of a forged drug document, illegal Rx)

MINOR

- 84 = DWI
 - 85 = Public Intoxication
 - 86 = Escape, Bail Jumping
 - 87 = Gambling
 - 88 = Probation Violation
 - 89 = Prostitution, Solicitation
 - 90 = Criminal Nuisance
 - 91 = Disorderly Conduct, Breach of Peace, Resisting Arrest
 - 92 = Loitering, Vagrancy
 - 93 = Indecent Exposure, Obscenity, Public Lewdness
 - 94 = Theft of Service
 - 95 = Other Violations
 - 96 = Traffic Infractions
 - 97 = Other Minor Offenses
- 98 = Other Crime (Impersonating an Officer, Cruelty to Animals)
- 99 = Insufficient Information (Attempt)

TABLE 3

Statistics for Persons Admitted to Prisons or Mental Hospitalsin New York: 1968 and 1978

	<u>10 Year Period</u>				<u>20 Year Period</u>	
	<u>1968</u> <u>Prisoners</u> (N=397)	<u>1978</u> <u>Prisoners</u> (N=398)	<u>1968</u> <u>Patients</u> (N=398)	<u>1978</u> <u>Patients</u> (N=400)	<u>1968</u> <u>Prisoners</u> (N=397)	<u>1968</u> <u>Patients</u> (N=398)
% with Subsequent Mental Health Hospitalizations	7.8	8.8	62.3	68.0	11.3	64.8
% with Subsequent Incarcerations	46.3	50.0	2.5	5.5	49.9	3.5
% with Subsequent Arrests	75.0 (N=264)	68.6 (N=398)	29.2 (N=390)	40.6 (N=399)	80.8 (N=364)	32.8 (N=390)
Rate of Subsequent Arrests	.435 (N=362)	.487 (N=398)	.105 (N=390)	.141 (N=398)	.301 (N=362)	.068 (N=390)
% with Subsequent Violent Arrests	29.4 (N=364)	26.4 (N=398)	8.2 (N=390)	10.0 (N=399)	35.4 (N=364)	9.2 (N=390)
Rate of Subsequent Violent Arrests	.067 (N=363)	.074 (N=398)	.014 (N=390)	.017 (N=399)	.043 (N=362)	.008 (N=390)
Mean Subsequent Time at Risk (Years)	7.6 (N=395)	6.5 (N=398)	9.2 (N=398)	9.5 (N=399)	16.1 (N=395)	18.3 (N=398)

TABLE 4

Factors Associated With Any Crime and With Violent Crime

Variable	<u>Prisoners</u>						<u>Patients</u>						
	<u>1968</u>		<u>1978</u>		<u>1968</u>		<u>1978</u>		<u>1968</u>		<u>1978</u>		
	Any Arrest	Violent Arrest	Any Arrest	Violent Arrest	Any Arrest	Violent Arrest	Any Arrest	Violent Arrest	Any Arrest	Violent Arrest	Any Arrest	Violent Arrest	
<u>Age</u>													
Under 20	.52 ¹	.08	.90 ³	.11 ²	.87.2 ²	.35 ⁴	.00 ³	.00.0 ²	.03 ²	.16.7	.00 ¹	.00.0 ¹	
20 - 30	.50	.08	.52	.08	73.4	.19	.03	.38.9	.19	47.6	.02	15.6	
30 - 40	.31	.05	.39	.06	74.2	.13	.02	34.1	.16	44.0	.02	10.3	
40 - 50	.38	.04	.44	.02	61.9	.05	.00	30.5	.07	35.8	.01	04.5	
Over 50	.34	.08	.04	.00	28.6	.01	.00	09.4	.09	29.5	.00	04.5	
<u>Prior Incarceration</u>													
No	.34	.06 ¹	.47 ²	.07	69.8 ²	.10 ²	.01	27.7 ²	.13 ⁴	40.1 ³	.02 ¹	09.8 ¹	
Yes	.49	.08	.58	.07	79.3	.22	.01	47.8	.41	69.6	.05	21.7	
<u>Non-White</u>													
No	.33 ⁴	.04 ⁴	.43 ¹	.07	69.0	.07 ³	.01 ¹	25.1 ¹	.12 ²	39.0 ¹	.01 ⁴	06.9 ²	
Yes	.56	.10	.55	.08	75.8	.19	.02	39.2	.21	47.9	.03	18.2	
<u>Prior Hospital</u>													
No	.45	.07	.54 ²	.07	74.3	.13	.01	25.8	.11 ²	34.7 ²	.01	09.0	
Yes	.42	.06	.32	.08	67.6	.08	.02	31.5	.17	46.2	.02	11.4	
<u>Prior Arrests</u>													
None	.22 ¹	.02 ²	.20 ¹	.02	50.0	.05 ⁴	.01 ³	18.3 ⁴	.04 ⁴	21.8 ⁴	.00 ⁴	02.3 ⁴	
Non-Violent	.45	.05	.54	.07	75.3	.20	.01	42.0	.19	55.5	.01	12.5	
Violent	.51	.10	.51	.09	73.8	.18	.03	55.6	.30	64.1	.06	25.6	

¹p < .1; ²p < .05; ³p < .01; ⁴p < .001

TABLE 5

Patterns of Subsequent Violence

For Schizophrenia and Prior Arrest History

(Percentage Violent)

	1968				1978			
	<u>No Priors</u>	<u>Non-Violent Priors</u>	<u>Violent Priors</u>	<u>Total</u>	<u>No Priors</u>	<u>Non-Violent Priors</u>	<u>Violent Priors</u>	<u>Total</u>
	(N=209)	(N=85)	(N=42)	(N=336)	(N=171)	(N=124)	(N=73)	(N=368)
<u>Diagnosis</u>								
Other	0.9	9.1	14.3	5.2	1.2	8.4	17.1	6.9
Schizophrenia	10.1	10.0	21.4	11.2	3.4	17.0	34.2	13.9
TOTAL	5.3	9.4	16.7	7.7	2.3	12.1	26.0	10.3

TABLE 6

Logistic Regression of Effects of Schizophrenia For Each History Type

	<u>1968</u>			<u>1978</u>		
	<u>B</u>	<u>S.E.</u>	<u>Odds Ratio</u>	<u>B</u>	<u>S.E.</u>	<u>Odds Ratio</u>
Schizophrenia / No Priors	2.2964**	1.0762	9.94	.5684	1.1819	1.76
Schizophrenia / Non-Violent	-.0937	.7984	.92	.3926	.6021	1.48
Schizophrenia / Violent	.5044	.8956	1.66	.6630	.6185	1.94
Arrest	1.5869	.6116	4.89	2.4938****	.6296	12.11
Violent / Non-Violent	1.0518*	.6165	2.86	.9553**	.4313	2.60
Age	-.0545**	.0230	.95	-.0728****	.0245	.93
Non-White	.4975	.4470	1.64	.8469**	.3939	2.33
Involuntary	-.7669	.4756	.46	-.0582	.4187	.94
Constant	-.2698	.8993		-.3202	.8346	

*p < .10; **p < .05; ***p < .01; ****p < .001

**SCHIZOPHRENIA AS A
RISK FACTOR FOR VIOLENCE**

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SCHIZOPHRENIA AS A CONTINGENT
RISK FACTOR FOR CRIMINAL VIOLENCE +

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**SCHIZOPHRENIA AS A CONTINGENT
RISK FACTOR FOR CRIMINAL VIOLENCE**

ABSTRACT

The occurrence of violence among diagnostic groups from 1968 and 1978 cohorts of admissions to New York State Psychiatric Centers is reported. Each cohort was followed for eleven years. Logistic regression models which assessed the relationship between diagnosis and criminal violence (an arrest for a violent crime) for patients with similar prior arrest histories were used. The models also controlled for age, race, and legal status at target admission. For the earlier cohort, significant differences in the probabilities of subsequent violence existed between schizophrenic and other patients only for patients with no prior arrests. For the 1978 cohort, only when patients had previously been arrested was there a significant relationship between diagnosis and violence. For these patients, schizophrenics were more likely to be violent than substance abusers.

The public has long perceived the mentally ill as unpredictable and dangerous and has believed that mental illness predisposes persons to violent behavior (Chuang et al., 1987; Lagos et al., 1977; Monahan, 1988; Mullen, 1984). Consistent with these assumptions, the state has the power to confine and detain the mentally ill who are deemed dangerous (Fagin, 1976). Such actions by the state are contingent upon a finding that an individual by reason of mental disorder poses a substantially high probability of committing a violent act. The role of clinicians in assessing such risks had become so common that Megargee (1976, p.15) claimed that most mental health professionals will, at some time in their careers, be required to assess the risk of harm to others and/or self.

Estimating the risk of violence among mentally disordered persons is a central task of mental health law. The American Psychiatric Association's Model State Law on Civil Commitment (1983) explicitly includes those "likely to cause harm to others" within the purview of involuntary hospitalization. Likewise, the National Center for State Courts' Guidelines for Involuntary Civil Commitment (1986) states that predictions of violence "will continue to provide a basis for involuntary civil commitment, even amid controversy about the scientific and technological shortcomings and the ethical dilemmas that surround them." In the criminal law, the American Bar Association's Criminal Justice Mental Health Standards (1984) endorse the position that posing "a substantial risk of serious bodily harm to others" should be the standard for the commitment of persons acquitted of crime by reason of insanity.

While demands for clinical assessments of risk of violent behavior seem ubiquitous, research seeking to establish a link between mental disorder and violence has been contradictory and inconclusive (Bloom, 1989; Binder and McNiel, 1990; Monahan and Steadman, 1983; Steadman et al., 1978a; Steadman et al., 1978b). In recent years, the research in this area has moved away from whether or not the base rate of community violence is higher for the mentally ill than for the general population. Instead, current investigations have sought to identify whether or not particular subgroups of mental

patients have significantly higher base rates of violence (Bloom, 1989). The purpose of this latter stream of research has been to identify which disorders and symptoms might be linked to violent behavior. Many of these studies have centered upon schizophrenia and violence (Bradford, 1983; Binder and McNiel, 1990; Chuang et al., 1987).

Research seeking to establish a link between schizophrenia and violent behavior has also been inconclusive. Some studies indicate that patients diagnosed as schizophrenic are more violent than other patients (Binder and McNiel, 1990; Blomhoff et al., 1980; Yeseavage et al., 1981). Rossi and colleagues (1986) have gone so far as to argue that so many studies have found a relationship between schizophrenia and violence, that the only question is whether the same relationship exists for different subtypes of schizophrenia. Others disagree. Krakowski, Valovka, and Brizer (1988) reviewed seven recent studies investigating the effects of diagnosis on violence. They found four that reported paranoid schizophrenics to have higher rates of violence than those with other diagnoses, two that reported paranoid schizophrenics to have lower rates of violence than those with other diagnoses, and one that reported no differences. Taylor (1982) has stated, "There is no doubt that schizophrenics are capable of violent behavior and, there, any certainty about the relationship between schizophrenia and violence ends."

While the results of examinations of the predictive value of diagnosis have been mixed, prior research has consistently shown sociodemographic (age, sex, and race) variables and prior history of violence to be the best predictors of future violence (Gunn, 1982; Monahan and Steadman, 1983). These findings are true for both the general population and for mental patients. These studies have also shown that the single best predictor of future violence is prior violence.

The relationship between past and future violence has been found to be so strong that a number of scholars have argued that clinicians should only predict violence potential when a past history exists (Litwack and Schlessinger, 1986; Pollack, 1990, p.211). Pollack (1990) has stated "One fundamental

tenet of predicting dangerousness is that violent behavior cannot be predicted in the absence of an established pattern of violence." The primary justification for this conclusion is that only when such a restriction is in effect will the base rate of violence be sufficiently high so as to allow adequate accuracy in prediction.

The view that meaningful violence prediction can only be made when prior histories of such behavior are present also suggests that the predictive validity of other factors, including diagnosis, might be contingent upon previous patterns of behavior. One of the reasons for the conflicting findings on the relationship between diagnosis and future violence may be the confounding effect of prior violence. Prior violence may have such a powerful effect on future violence that it masks the effect of other factors, such as diagnosis.

The purpose of this study is to assess the predictive value of a diagnosis of schizophrenia in patients controlling for arrest history. We define subsequent violence as an arrest for a violent crime (murder, manslaughter, rape, attempted murder, attempted manslaughter, attempted rape, assault, kidnapping, and sodomy) after release into the community. To assess the stability of the results over time, we collected information for patients from two time periods a decade apart and traced their arrest records for eleven years.

SAMPLE AND METHODS

The two study cohorts were adult males admitted to a New York State Office of Mental Health civil facility in 1968 or 1978.³ The samples included both voluntary and involuntary patients. Excluded were persons transferred from other state mental hospitals, admitted into special facilities for the mentally retarded or for alcoholics, admitted into a New York State Department of Corrections mental health facility, or admitted to special secure facilities operated by the New York State Department of

Mental Health. All arrest history data were obtained from New York State Division of Criminal Justice Services and all hospitalization data were obtained from the New York State Office of Mental Health.

We recorded each patient's chart diagnosis at target admission, age at admission (in years), race (white or non-white), and prior arrest history (none, arrests for only non-violent crimes, or at least 1 arrest for a violent crime). For all of the analyses except for the initial description of the samples, we recoded primary diagnosis into three categories: schizophrenia, substance abuse (alcohol or drug use), and other. The majority of cases, 86.7%, had a primary diagnosis of either schizophrenia or substance abuse. The proportion of cases receiving any other specific diagnosis was too low to allow any meaningful statistical analysis of those diagnostic categories. For example, there were only four patients with a diagnosis of mental retardation.

We collected data on subsequent arrests from the New York State Division of Criminal Justice Services for 11 years after inpatient admission (i.e., 1968 to 1978 and 1978 to 1988). Over that time, we recorded whether or not a patient was arrested for a violent crime. Using these variables and limiting our analyses to (1) those patients under the age of 50 at admission, (2) those patients for whom we had complete records, (3) those with an Axis I diagnosis, and (4) those who had been released within 5 years of their target admission, the sample sizes of the 1968 and 1978 cohorts were 255 and 327, respectively.⁴ This last restriction was to guarantee at least the potential for a lengthy time at risk.⁵ For the 1968 and the 1978 cohorts, the mean number of years at risk during the follow-up were 9.2 and 8.8 respectively. These numbers represent the average number of years each patient was in the community until the end of the follow-up if they were never arrested for a violent crime or until they were arrested for a violent crime. The average times at risk prior to arrest for patients who were arrested in the follow-up were 5.1 years for the earlier cohort and 3.6 years for the later one.

RESULTS

Table 1 displays the descriptive statistics of all the variables for both cohorts. Patients in the 1978 cohort were on average 2.2 years younger, at the time of their target admission, than patients in the 1968 cohort ($t = 3.07$, $df = 580$, $p < .01$). Patients in the latter cohort tended to have more extensive criminal histories ($X^2 = 9.37$, $df = 2$, $p < .01$) and were less likely to be admitted involuntarily ($X^2 = 5.16$, $df = 1$, $p < .05$). Racial composition was not significantly different across the two cohorts. Clearly, the diagnostic category with the largest number of cases was schizophrenia. The second largest category was substance abuse. The only other diagnostic category with more than 4% of a cohort was affective disorder/depression in the 1978 cohort. Based upon the three categories of diagnosis, there was no difference between the two cohorts in the distribution of diagnosis.

INSERT TABLE 1

The analysis consisted of two steps. First, we assessed the bivariate relationship between each of the independent variables and subsequent arrest for violence. The analytic techniques used to assess these relationships were t-tests (for age differences between those who were subsequently violent and those who were not) and contingency tables. Second, we employed logistic regression to test the predictive value of diagnosis as a function of prior arrest history while controlling for age, race, and legal status.

Table 2 displays the results of the initial tests for significant relationships between each of the independent variables and subsequent violence. For the 1968 cohort, the only variable significantly related to subsequent violence was prior arrest history ($X^2 = 6.14$, $df = 2$, $p < .05$). In the later cohort, prior arrest history was again significantly related to subsequent violence ($X^2 = 30.79$, $df = 2$, $p < .001$). Additionally, non-whites were significantly more likely to be violent than whites ($X^2 = 8.96$, $df = 1$, $p < .01$) and those who were arrested for a violent crime were on average 3.9 years younger than those who were not ($t = 2.65$, $df = 325$, $p < .01$). The significant findings for age, race, and arrest histories

in the latter cohort were consistent with prior research examining both mental health patients and the general population.

INSERT TABLE 2

We next calculated the probability of subsequent violence for each combination of diagnosis and arrest history in each cohort (c.f. Table 3). In the 1968 cohort, the percentage of schizophrenics subsequently violent is somewhat higher than that for substance abusers for every type of arrest history, but the difference is rather small where there has been a prior arrest. The largest difference occurs when examining patients with no prior arrests. Of the schizophrenics, 10.7% were subsequently violent and only 2.2% of the substance abusers were. The pattern for patients with a diagnosis other than schizophrenia or substance abuse is rather uneven, but small sample sizes (19 with no priors, 8 with non-violent priors, and 5 with violent priors) contributed much to this instability. In the 1978 cohort, the difference between schizophrenics and substance abuse with no prior arrests disappears, 3.5% versus 2.6%. There were only a total of 4 patients with no prior arrests who were subsequently arrested for a violent crime. Concurrently, the percent of schizophrenics with an arrest history, violent or not, who were subsequently violent was higher than that of substance abusers with the same arrest history. For those with no prior arrests, the percentage of patients subsequently violent was highest for patients with a diagnosis other than schizophrenia or substance abuse, but small sample sizes limit such conclusions. While there were 27 such patients with no prior arrests, there were only 14 with non-violent priors and only 4 with violent priors. An inspection of these data suggest that differences across the diagnostic groups in the probability of a subsequent arrest for a violent crime did depend upon prior arrest history. This interactive effect was not constant over time. These data do not, however, control for patient age, race, and legal status.

INSERT TABLE 3

To address the potential effects of these other variables, we next employed logistic regression analysis, a technique suited to the prediction of a dichotomous dependent variable, to test the predictive value of diagnosis for each arrest history (Hosmer and Lemeshow, 1989). For each cohort, we first analyzed the data for patients who had no prior arrests and then analyzed the data for those who had at least one prior arrest. For the analysis of patients with no prior arrests, we first entered patient age (in years), race (non-white or not), and legal status (involuntary or not). We then added two diagnostic variables. One was a 0/1 coded variable indicating whether or not the primary diagnosis was substance abuse and the other was a 0/1 coded variable indicating whether or not the primary diagnosis was "other" than substance abuse or schizophrenia. Patients whose primary diagnosis was schizophrenia were coded zero on both of these variables and served as the referent group. In other words, the parameters associated with these indicator variables compare the probability of a subsequent arrest for a violent crime for patients with these diagnoses and patients with a diagnosis of schizophrenia. The test of the effect of diagnosis is the test of whether or not both of these parameters are simultaneously equal to zero. We performed a log-likelihood test of whether or not the addition of diagnosis added significantly to the prediction of violence over and above the effects of age, race, and legal status.

For the analysis of patients with prior arrests, we used procedures identical to those used for patients with no prior arrests except that the variables initially entered in the logistic regression equation also included a 0/1 coded variable indicating whether or not a patient had previously been arrested for a violent crime. We would have preferred to have run separate analyses for patients with priors but none for violent crimes and for patients with at least one prior arrest for a violent crime, but the sample sizes would have been too small to allow meaningful results from the hypothesis tests.

Table 4 displays, for each cohort, the resulting logistic regression models for patients with no prior arrests. In the 1968 cohort, diagnosis was significant ($X^2=6.767$, $df=2$, $p<.05$) even after controlling for age, race, and legal status. The probability of a subsequent arrest for a violent crime

was highest for schizophrenics and lowest for patients in the other diagnostic category. In the 1978 cohort, diagnosis did not add significantly ($X^2=4.103$, $df=2$, $p > .12$) to the prediction of violence.

INSERT TABLE 4

Table 5 displays for each cohort the resulting logistic regression models for patients with at least one prior arrest. In the 1968 cohort, diagnosis was not significant ($X^2= 0.032$, $df=2$, $p > .98$). For these patients, the presence of a prior arrest for a violent crime, age, and race were statistically significant. In the 1978 cohort, diagnosis did add significantly ($X^2=6.799$, $df=2$, $p < .05$) to the prediction of violence above and beyond age, race, and legal status. Schizophrenics were significantly more likely to be violent than patients diagnosed with a substance abuse problem. There was no statistically significant difference in the probability of subsequent arrest for a violent crime between schizophrenic patients and those in the "other" category. The presence of at least one prior arrest for a violent crime, age, and race were significant as well.

INSERT TABLE 5

DISCUSSION

Our results produced a number of interesting patterns between diagnosis and subsequent arrests for violent crimes that did not change even when controlling for age, race, and legal status. For the patients in the 1968 cohort, who had no prior arrests, diagnosis was a significant predictor. Schizophrenics were the most likely group to be arrested for a violent crime. Nine of the eighty-four schizophrenics had violent arrests while only one of the forty-five substance abusers and none of the 19 other patients were. For patients in this cohort who had previously been arrested, diagnosis was not a significant risk marker. Based upon these data, the correct procedure for predicting would have been to first ask about a patient's prior arrest history. Only if there had been no prior arrests would one need to determine patient diagnosis.

The results for the 1978 cohort were the opposite of those in the 1968 cohort. For patients with no prior arrests, diagnosis was not a significant risk marker. Only 4 of the 151 patients with no priors were subsequently arrested for a violent crime. For patients with at least one prior arrest, diagnosis was again a significant risk marker for subsequent criminal violence. Schizophrenics were significantly more likely to be violent than substance abusers. There was no difference between schizophrenics and patients in the "other" diagnosis category. For the 1978 patients the correct procedure for predicting would have been to first ask about a patient's arrest history. Only if there had been at least one prior arrest would one need to determine diagnosis.

The probability of subsequent violence for patients diagnosed with a mental illness other than schizophrenia or substance abuse was never significantly different from that for other patients. One reason for this finding was the extremely small sample sizes of that group. The results do suggest that the probability of subsequent criminal violence for these patients increased over time, but the change in the composition of this group contributed to this difference. In the earlier cohort, patients diagnosed with an affective disorder or depression comprised 15% of the patients with a diagnosis other than schizophrenia or substance abuse. In the 1978 cohort, they represented 68.9%.

When diagnosis was significant, substance abusers were the least likely to be subsequently violent. This result was somewhat inconsistent with the recent research that has found a relationship between substance abuse and violence (Nurco, et al., 1991). Part of this discrepancy could have been due to our inability to differentiate alcohol abusers from drug users in the data and to differentiate narcotic drug users from nonnarcotic drug users. Research has found that the relationship between crime and substance abuse can vary according to type of substance being abused (Nurco, et al., 1991). Another difficulty with our data was that we only had primary diagnosis. Results from recent research suggests that there is an interaction effect between substance abuse and other diagnosis as they relate to violence (Swanson, et al., 1990). Our data would not allow such investigations.

Regarding the stability of the results over time, the findings showed several clear differences. As already stated, the interactive effect of diagnosis and arrest history in predicting violence changed. The biggest change between the two cohorts was in the percentage of schizophrenics with no prior arrests who were subsequently violent. This went from 10.7% in 1968 to 3.5% in 1978, a remarkable decline. Unfortunately, the amount of information available to interpret this difference was limited. It may be that the deinstitutionalization of the 60's and 70's increased the number of "acting out" patients who were arrested instead of hospitalized, thereby decreasing the number of patients with the potential for subsequent arrest who were in the no prior group. However, our data do not allow us to test this explanation.

Even with the difficulties due to small sample size and an inability to disaggregate diagnosis fully, the results from this study have direct implications for understanding the relationships between mental disorder and violent crime. First, while it was true that the results of this study indicated that the patients who had previously been criminally violent were more likely to be subsequently violent, the findings suggest caution in accepting the claim that risk assessment can and should only be made when extensive prior histories of violence are present. For both cohorts, patients with prior arrests for violent crimes were more likely to be subsequently violent than patients with prior arrests for only non-violent crimes, but the largest difference in probability of future violence was between patients with no priors and patients with priors, violent or not. The results for diagnosis in the 1968 cohort offer further evidence. Diagnosis clearly was a risk marker that would merit attention in the 1968 cohort. In the 1978 cohort, however, it was true that the base rate of violence for patients with no priors was too low (2.6%) to allow for meaningful analysis.

Second, the results also argue that the risk assessment of violence can be enhanced by the consideration of interaction effects. In both cohorts, the predictive power of diagnosis was dependent upon prior arrest history. This was the only interaction we addressed in this paper. Ideally, a fully

parameterized model which would allow for the interaction among the complete set of predictors should be employed. Due to the sample size and the small number of patients subsequently violent, such an approach was impossible with the data in this study. For example, our data did not allow use to assess particular facets of schizophrenia. Much of the current literature suggests that it is not so much the diagnosis of schizophrenia per se that is a risk factor for violence, but more specific aspects of schizophrenia, such as thought disorders, delusions, hallucinations (Blomhoff, et al., 1990; Bradford, 1983; Craig, 1982; Taylor, 1985).

This study indicates that there were real changes in the mental health system in New York over time. An number of prior studies have suggested that inconsistencies in findings examining mental disorder and violence results from the eras of the studies. Research based on samples of patients hospitalized prior to 1965 revealed that released patients were less likely to be criminally violent than the general population, while those studies based on samples of patients hospitalized after 1965 have produced the opposite (Monahan and Steadman, 1983; Teplin, 1984). For instance, Steadman et al. (1984) found that while 15% of the patients in New York State mental Hospitals in 1947 had at least one prior arrest, 40% of the patients had priors in 1975 and 51% had priors in 1978. Regardless of why the results occurred, they point for the type of research questions examined here is that such changes have dramatic implications for risk assessment. The mental health and criminal justice systems are dynamic rather than static. Therefore, how the factors that accurately predict who will be violent may vary by the composition of the persons in the system at particular points in time.

FOOTNOTES

1. Carmen Cirincione, B.A., Henry J. Steadman, Ph.D., and Pamela Clark Robbins, B.A., Policy Research Associates, Inc., 262 Delaware Avenue, Delmar, New York 12054.
2. John Monahan, Ph.D., School of Law, University of Virginia, Charlottesville, Virginia 22901.
3. While the sampling procedure could have lead to a subject being included in both cohorts, no subject was in both cohorts.
4. The data set was originally collected for the LEAA/NIJ funded study, "The Movement of Offender Populations Between Correctional and Mental Health Facilities" 1979-1982. The original sample size of each cohort was 400. Most of the cases that were omitted were so because of missing information and being 50 years of age or older.
5. The restriction lead to the exclusion of only three cases.

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TABLE 1
SAMPLE CHARACTERISTICS FOR 1968 AND 1978 COHORTS

	<u>1968</u> (N=255)		<u>1978</u> (N=327)	
<u>Age</u>				
Mean		34.3		32.1
	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>
<u>Race</u>				
Non-white	83	32.5	117	35.8
White	172	67.5	210	64.2
<u>Prior Arrest History</u>				
No prior arrest	148	58.0	151	46.2
At least 1, but none for a violent crime	73	28.6	108	33.0
At least 1 for a violent crime	34	13.3	68	20.8
<u>Legal Status</u>				
Voluntary	136	53.3	206	63.0
Involuntary	119	46.7	121	37.0
<u>Diagnosis</u>				
Schizophrenia	123	48.2	168	51.4
Substance Abuse	100	39.2	114	34.9
Affective / Depression	5	2.0	31	9.5
Neurosis	5	2.0	0	0.0
OBS - Psychosis	9	3.5	1	0.3
Paranoid	0	0.0	2	0.6
Mental Retardation	2	0.8	4	1.2
Other Developmental	2	0.8	1	0.3
Other	9	3.5	6	1.8
<u>Subsequent Violence</u>				
No	230	90.2	291	89.0
Yes	25	9.8	36	11.0

TABLE 2
BIVARIATE RELATIONS WITH SUBSEQUENT VIOLENCE

	<u>Percent Subsequently Arrested for a Violent Crime</u>	
	<u>1968</u>	<u>1978</u>
<u>Diagnosis</u>		
Schizophrenia	12.2	14.3
Substance Abuse	8.0	6.1
Other	6.3	11.1
<u>Prior Arrests</u>		
No Priors	6.8**	2.6 ****
Non-Violent	11.0	12.0
Violent	20.6	27.9
<u>Race</u>		
White	8.1	7.1****
Non-White	13.3	17.9
<u>Legal Status</u>		
Voluntary	11.0	9.7
Involuntary	8.4	13.2

*p < .10; **p < .05; ***p < .01; ****p < .001

TABLE 3
 PATTERNS OF SUBSEQUENT VIOLENCE
 BY DIAGNOSIS AND PRIOR ARREST HISTORY

	<u>Percent Subsequently Arrested for a Violent Crime</u>							
	1968				1978			
	<u>No Priors</u>	<u>Non- Violent Priors</u>	<u>Violent Priors</u>	<u>Total</u>	<u>No Priors</u>	<u>Non- Violent Priors</u>	<u>Violent Priors</u>	<u>Total</u>
	(N=148)	(N=73)	(N=34)	(N=255)	(N=151)	(N=108)	(N=68)	(N=327)
<u>Diagnosis</u>								
Schizophrenia	10.7	11.1	25.0	12.2	3.5	16.7	37.1	14.3
Substance Abuse	2.2	7.9	23.5	8.0	2.6	4.3	13.8	6.1
Other	0.0	25.0	0.0	6.3	0.0	21.4	50.0	11.1
TOTAL	6.8	11.0	20.6	9.8	2.6	12.0	27.9	11.0

TABLE 4
 LOGISTIC REGRESSION RESULTS:
 PATIENTS WITH NO PRIOR ARRESTS

	<u>1968</u> (n=148)		<u>1978</u> (n=151)	
	<u>B</u>	<u>S.E.</u>	<u>B</u>	<u>S.E.</u>
Age	-.0244	.0424	-.4178	.2233*
Non-White	.3424	.7087	-.4365	1.1526
Involuntary	-.9332	.7116	1.2499	1.4774
Diagnosis				
Substance Abuse	-1.8112	1.1077	2.2117	1.6198
Other	-8.1723	36.9221	-7.9841	41.6828
Constant	-1.0002	1.4334	5.8856	5.2037

*p < .10; **p < .05; ***p < .01; ****p < .001

TABLE 5
LOGISTIC REGRESSION RESULTS:
PATIENTS WITH AT LEAST ONE PRIOR ARREST

	<u>1968</u> (n=107)		<u>1978</u> (n=176)	
	<u>B</u>	<u>S.E.</u>	<u>B</u>	<u>S.E.</u>
Age	-.0642	.0392	-.0949	.0326***
Non-White	.7712	.6115	.9241	.4600**
Involuntary	-.9338	.7018	-.1762	.4805
Violent	1.0521	.6532	1.4218	.4812***
Diagnosis				
Substance Abuse	-.1129	.6714	-1.0719	.5615*
Other	-.0105	.9540	.6924	.6654
Constant	.1301	1.3509	.6864	1.0413

*p < .10; **p < .05; ***p < .01; ****p < .001

**MENTAL ILLNESS AS A FACTOR IN CRIMINALITY:
A STUDY OF PRISONERS AND MENTAL PATIENTS +**

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The general public, at least since the time of ancient Rome, has been concerned that the mentally ill present a threat to the safety of the community (Monahan, 1988). While a relationship between mental disorder and criminality has long been presumed, research has not established what the nature of that relationship might be (Binder and McNeil, 1990). The most consistent finding in the literature is that the correlates of crime and violence are the same for the mentally disordered and the general public (Monahan and Steadman, 1983). Typically, young males with an established pattern of crime present the highest risk, whether or not mental disorder is present (Klassen and O'Connor, 1988; Swanson, Holzer, Ganju, and Jono, 1990).

One of the serious difficulties in the research investigating the relationships of mental disorder to crime is the absence of direct comparisons at the same points in time in the same jurisdictions of the rates of offending of persons with and without mental disorder. For example, while it is presumed that both prison inmates and mental patients have high rates of subsequent offending, no study has directly compared the two groups. Steadman, Vanderwyst, and Ribner (1978) did compare jail detainees and mental patients in Albany County, New York, in 1968 and 1975. They found that jail detainees had consistently higher rates of subsequent arrests for all offense classes than the released mental patients. Both groups had higher rates than the general population. Among the mental patients, those with the higher rates were younger and more often previously arrested, just as among the jail inmates, suggesting mental disorder was a less important factor in arrest than the usual criminologic factors.

In the study reported here, we directly compare for the first time long-term patterns of crime for mentally disordered patients and for prison inmates who were institutionalized at the same time in New York State. We compared subsequent crime and violence across four groups: prisoners with no mental health history (Group 1), prisoners with a mental health history (Group 2), patients with a prior arrest history (Group 3), and patients with no prior arrests (Group 4). Group 1 and Group 4 represent the "pure" types; they have only been treated by one of the two systems (criminal justice or mental

health). Group 2 and Group 3 represent the "hybrid" types because they have been treated at various times in both systems.

Our particular interest in these comparisons was to compare prisoners with no history of institutionalization for mental disorder (Group 1) with both mental patient groups. Our hypothesis, based on prior literature showing that criminologic variables are the best predictors of subsequent arrests, was that both prisoner groups and patients with prior arrests would have higher arrests than mental patients with no prior arrests.

SAMPLE AND METHOD

Our sample included four cohorts of male subjects; a prisoner cohort and a mentally disordered patient cohort each from two time periods. They were chosen by selecting every *n*th name in the admission list to obtain an initial sample size of 400 for each cohort. The mental patient samples consisted of adult males under the age of 65 admitted into New York State Department of Mental Health facilities in 1968 (Era 1) and those admitted to these same facilities in 1978 (Era 2). The prisoner samples were drawn in the same way from inmates admitted to New York State prisons in the same two years (c.f. Steadman, et al., 1984).

We followed all subjects for eleven years from their time of admission. The follow-ups went through 1978 for the earlier cohorts and through 1988 for the later cohorts. We collected each subject's age at admission, number of incarcerations prior to target admission, race (non-white and white), mental health hospitalization history prior to target admission, and arrest history prior to target admission. Violent crimes included murder, manslaughter, rape, assault, kidnapping, and sodomy. To assess subsequent crime, we used two measures: (1) a dichotomous variable which indicated if a subject had ever been arrested for any crime during the follow-up period; and (2) each subject's arrest rate (the number of arrests per year at risk). Time at risk was the time spent in the community. We used the

same two measures to assess subsequent criminal violence, with occurrence limited to arrests for violent crimes. All data were collected from official records. Hospitalization histories were obtained from the New York State Office of Mental Health; arrest histories were obtained from the New York State Division of Criminal Justice Services; and incarceration histories were obtained from the New York State Department of Correctional Services.

Our definitions of mental disorder, an admission to a New York State mental health facility, and of criminality, an arrest, are certainly less than ideal. As Monahan and Steadman (1983) pointed out, a hospitalization is a measure of treated mental disorder rather than actual mental disorder. Likewise, arrest is a measure of "treated" crime rather than "actual" crime.

Nonetheless, as Monahan and Steadman (1983) argue, "while arrest may reflect selective treatment for any given criminal act, it may also be a reasonably accurate indicator of those who are true criminal actors." If one assumes a high probability that a true criminal and someone truly mentally ill eventually enter the appropriate forms of treatment, these measures should capture the correct populations.

The use of both subsequent rates and the dichotomous variable indicating whether there was at least one subsequent arrest was based on one primary consideration. The factors affecting whether or not a person will do something and the rate at which they will do it can differ (Barnett, Blumstein, and Farrington, 1987). We excluded cases for which information on all the variables was not known, for which there was no time at risk, and for whom the date of release was more than 5 years after admission. The last restriction was to allow for adequate and comparable times at risk across the cohorts. It led to the omission of only thirty-three cases. The resulting sample sizes for the 1968 and 1978 prisoners were 335 and 352 respectively, and for the 1968 and 1978 patients were 352 and 380 respectively. We had complete records and adequate follow-up for 89% of our initial sample. While the time restriction did not affect many cases, it did highlight a potential bias in our sample. Patients

and prisoners in our study had relatively short lengths of stay for their target admission. It is possible that those who would pose the greatest risk of subsequent criminal activity are those who are retained longer.

The analysis consisted of two steps. First, we compared the characteristics of the four cohorts (1968 and 1978, prisoners and patients) and examined the relationship between each of these characteristics and the dependent variables. The analysis consisted of contingency tables, analysis of variance, the Kruskal-Wallis One-way Analysis of Ranks Test (Siegel and Castellan, 1988), and logistic regression (Hosmer and Lemeshow, 1980). Next, using the Kruskal-Wallis Test and logistic regression, we compared levels of subsequent arrests and violence for the four groups (prisoners with no prior mental health history, prisoners with prior hospitalizations, patients with prior arrests, and patients with no prior arrests) in the two time eras.

Logistic regression was used when testing for differences among the groups in the percentage of group members that were subsequently violent or arrested. The dependent variable here is a dichotomous variable and logistic regression is a method that is well suited to the predictions of such variables. We employed the Kruskal-Wallis Test to compare the rates of subsequent crime and violence for the groups. With a dependent variable that is a ratio level measure, one would typically use an analysis of variance approach. An assumption of that procedure is that the dependent variable is normally distributed. The rates we observed were highly skewed and, therefore, results from an ANOVA could be misleading. The Kruskal-Wallis Test is a nonparametric procedure that tests the hypothesis that the groups come "from identical populations with the same median" (Siegel and Castellan, 1988). The test does not assume the groups are normally distributed, but does assume that the groups have the same distributions and that the dependent variable is at least ordinal.

RESULTS

Table 1 displays the descriptive statistics for each of the four cohorts. As expected, prisoners and patients differed in age ($F=113.28$; $df=3, 1416$; $p<.001$). Prisoners were younger than patients and the 1968 patients older than the 1978 patients. The two groups also differed significantly in prior incarcerations and prior hospitalizations (for incarcerations: $X^2=339.975$, $df=3$, $p<.001$ and for hospitalizations: $X^2=359.014$, $df=3$, $p<.001$). Prisoners were more likely to have been incarcerated than patients and the 1968 prisoners were more likely to have been incarcerated than the 1978 prisoners. Patients were more likely to have been previously hospitalized than prisoners. Because the target admission for prisoners was an arrest leading to an incarceration and the target admission for patients was a hospitalization, these results show that the likelihood of a prisoner having had multiple incarcerations was higher than that of a patient ever having been incarcerated and the likelihood of multiple prior hospitalizations for a patient was higher than that of a prisoner ever having been hospitalized.

Insert Table 1

The racial composition of the groups was different ($X^2=144.668$, $df=3$, $p<.001$). The groups also differed significantly on any prior arrest and for a prior arrest for a violent crime (for all arrests: $X^2=120.962$, $df=3$, $p<.001$ and for violent crimes: $X^2=422.686$, $df=3$, $p<.001$). Generally, the proportion of prisoners who were non-white and who had prior arrest histories was higher than the proportion of patients who were non-white and who had prior arrest histories. In addition to differences between prisoners and patients, there were differences between the 1968 and 1978 cohorts. For prisoners, the 1978 cohort had a higher proportion of non-whites, a lower proportion with prior incarcerations, and a higher proportion with a prior arrest for a violent crime than the 1968 cohort. For patients, the 1978 cohort was younger and had a higher proportion with prior arrests for both nonviolent and violent crimes than the 1968 patients. This same result has been noted in other studies

of changes in state mental hospital populations post-deinstitutionalization (Steadman, Coccozza, and Melick, 1978; Sosowsky, 1980; Rabkin, 1979). Its exact causes are debated, but the steady increase in the proportion of state hospital patients with arrests prior to admission after deinstitutionalization is well established.

Subsequent Arrest Rates

Table 2 reports the subsequent rates and the percentage of subjects ever subsequently arrested for any crime and for violent crimes for both prisoners and patients in the 1968 and 1978 cohorts. In both years, prisoners were more likely to be subsequently arrested and to be criminally violent than patients. The only difference between 1968 and 1978 cohorts was for patient cohorts and arrest. The 1978 patients were more likely to be subsequently arrested than the 1968 patients. The results are the same for rates. These results are similar to the Steadman et al. (1978) data on jail detainees compared to state mental hospital patients in New York.

Insert Table 2

Correlates of Crime/Violence

We next tested the relationship between each of the independent variables and the dependent variables (both any crime and violent crime) measured both with the dichotomies and with the rates. We used contingency tables to test for relationships with the dichotomous variables and, because the rates were so highly skewed, the Kruskal-Wallis One-Way Analysis of Ranks Test with the rates. Table 3 displays the results. A clear pattern emerged. Among both prisoners and patients in both 1968 and 1978 cohorts, younger, non-white subjects with more extensive incarceration and arrest histories were more likely to be subsequently arrested and to be criminally violent. The one variable not often significant was prior hospitalization.

Insert Table 3

Tests of Group Differences in Subsequent Arrest

The purpose of this analysis was to determine whether there were differences in subsequent crime and/or violent crime rates among the four groups (prisoners with no prior mental hospitalization history (Group 1), prisoners with a prior mental hospitalization history (Group 2), patients with a prior arrest history (Group 3), and patients with no prior arrest history (Group 4)). This gets at the core questions of our investigation. The first analysis was to compare subsequent annual arrest histories for subjects in each of the two time eras. Table 4 displays the mean and median subsequent annual arrest rates for each of the groups, the average annual arrest rate ranks for each group, and the results from the multiple comparison tests following the overall Kruskal-Wallis Test. To maintain an acceptable experimentwise Type I error rate, a Bonferroni correction was used (Hays, 1981). With six possible pairwise comparisons, the cutoff probability for each individual test was set at .008 (.05 divided by 6). Because this procedure is so conservative, we also reported the results with an experimentwise error rate of .10 (.017 for each pairwise comparison). For the 1968 cohort, prisoners had higher rates than patients, and patients with prior arrests had higher rates than patients with no prior arrests. For the 1978 cohorts, the multiple comparison test results were similar to those for the 1968 cohorts, except that prisoners with prior hospitalizations were no longer significantly different from patients with prior arrest histories. These results indicate that there were clear distinctions among the four groups: prisoners with or without prior mental hospitalizations were the most prone to subsequent arrest and patients with no prior arrest histories were the least likely to exhibit such behavior. As hypothesized, for both eras, groups 2 and 3 had the intermediate levels of arrest rates, and in the later era, there was no statistically significant difference between these two groups.

Insert Table 4

In addition to examining differences in the rate of subsequent arrest, we tested for differences in the probabilities of ever being arrested among the four groups in each cohort. Table 5 displays the percentage of each group subsequently arrested and the relative likelihoods of being subsequently arrested (the odds ratio). This table also includes the adjusted odds ratios and the test results from the logistic regression model that included age and race as covariates. In the 1968 cohort, patients with no prior arrests were less likely to be subsequently arrested than each of the other groups, and prisoners with no prior mental hospitalizations were more likely to be arrested than patients with prior arrests. For the covariates, age ($X^2=31.71$; $df=1$; $p<.001$) was inversely related to subsequent arrest, and nonwhites ($X^2=12.23$; $df=1$; $p<.001$) were more likely to be subsequently arrested. This set of results is fairly consistent with those for the 1978 subjects. In the latter cohort, the difference between prisoners with no prior hospitalization was no longer significantly different from patients with prior arrests. The ordering of the groups was consistent across years, but the differences among the two prisoner groups and the patients with prior arrests was smaller. Age was again inversely ($X^2=16.92$; $df=1$; $p<.001$) related to arrest, and nonwhites were somewhat ($X^2=3.31$; $df=1$; $p<.07$) more likely to be subsequently arrested than whites.

Insert Table 5

Several patterns emerged from the two sets of analyses of subsequent arrest. First, no matter how measured, the two "pure" groups -- prisoners with no prior hospitalizations and patients with no prior arrests -- always differed significantly. The former group was more likely to be rearrested than the latter is of ever being arrested. Second, the two prisoner cohorts were never statistically significantly different from one another. Third, these findings suggest that the two hybrid cases are intermediate cases. Finally, the difference between patients with prior arrests and other patients was greater for the 1978 cohort than the 1968 cohort.

Tests of Group Differences in Subsequent Arrest for Violent Crimes

We next performed these same tests while focusing on arrests for violent crimes. These results are similar to those for all arrests. Table 6 displays the results for the test of differences in subsequent arrest rates for violent crimes. For the 1968 cohorts, prisoners with no prior mental health history had significantly higher rates than both patient groups while the 1978 cohort patients with no prior arrests had rates significantly lower than those for all other groups. For all four groups, the median rate was 0.00 in both eras which means that very few subjects were ever subsequently arrested for a violent crime.

Insert Table 6

Table 7 displays the results for the test of differences in the probabilities of ever being arrested for a violent crime in the follow-up period. The post hoc tests were consistent for each era. Patients with no prior arrests were less likely to be subsequently criminally violent than any of the other groups. The number of prisoners with prior mental hospitalizations could have contributed to the lack of significance for the difference between that group and patients with prior arrests in both cohorts and between that group and prisoners with no prior mental hospitalizations in the 1978 cohort. For the covariates, age was inversely related to criminal violence in both eras (for 1968, $X^2=9.17$; $df=1$; $p<.01$ and for 1978, $X^2=23.94$; $df=1$; $p<.001$) and non-whites were generally more likely to be arrested for a violent crime for the 1968 cohort (for 1968, $X^2=13.73$; $df=1$, $p<.001$ and for 1978, $X^2=2.62$; $df=1$; $p<.11$).

Insert Table 7

These results highlighted two points. Rates of violence were very low. The only differences found by the test on rates involved the most extreme groups. A much clearer and more stable picture results from the analysis of probabilities. Patients with no prior arrests were the least likely to be subsequently arrested for a violent crime.

DISCUSSION

These analyses revealed a number of consistent findings. First, in line with previous research (Monahan, 1981), having a prior arrest history is a stronger predictor of subsequent arrest than is a history of state mental hospitalization. A patient with no prior arrest history posed a much lower risk of subsequent arrest than a prisoner or a patient who had at least one prior arrest. Second, prisoners with no prior hospitalization consistently posed the highest risk. For all cases, except for subsequent arrest for a violent crime in the 1978 cohort, prisoners with no prior hospitalizations had the highest rates and probabilities (although never statistically significantly higher than those for prisoners with prior hospitalizations). Third, the estimated rates and probabilities for the two "hybrid" cases fell between the two "pure" groups (with the one exception cited above). Finally, the ordering of the estimates was fairly consistent (from most to least risk: prisoners with no prior hospitalizations, prisoners with prior hospitalizations, patients with prior arrests, and patients with no prior arrests).

This ordering has several implications. The typical prisoner poses a much higher risk of criminality than the typical patient. Because prisoners with prior hospitalizations routinely had rates and probabilities lower than prisoners without prior hospitalizations, there was some evidence that mentally disordered prisoners pose a slightly lower risk, but not by so much as to be statistically significant in our samples. This might suggest that the difference was due to pre-existing differences between these groups of prisoners and/or to differences in how they are managed or treated by the criminal justice system. The ordering of the two hybrid groups has similar implications. While not often statistically significant, patients with prior arrests had lower rates and probabilities than prisoners with prior hospitalizations.

All of these conclusions must be tempered by a number of the limitations of the study. The first is the problems associated with the use of arrest data to assess criminality and criminal violence. One could argue that rather than assessing the risk of subsequent criminality, the findings can be due to

differences in management methods. The results for the two most extreme groups would then show a consistency in treatment systems. The middle range values for the two hybrid cases might be due to the combined use of the two systems and thus the reduced use of any given system. All of these are plausible alternative interpretations, but our data cannot address these issues.

The second difficulty in interpretation of the impact of mental disorder on arrest is the lack of a control group -- i.e., people who had never been arrested and never been hospitalized. Without such data, we could not fully assess the relationship between mental illness and criminal arrest -- both the probability of an arrest and the number of arrests per time at risk.

While individual-level data for the general population are not available, statewide, aggregate data for our study years 1968 through 1988 provide some useful comparisons.¹ There were 0.43 arrests per adult male (aged 16 to 65) in New York State from 1968 through 1978 and for the years 1978 to 1988, those figures were 0.64. While these data do not capture the proportion of the population that was arrested and the individual rate of arrest, they do offer some insights for our study. We calculated the number of arrests per person for each of the four groups in each of the two eras. For the 1968 cohort, the results were: 3.25 arrests per prisoner with no prior hospitalizations; 2.4 arrests per prisoner with prior hospitalizations; 1.77 arrests per patient with prior arrests; and 0.37 arrests per patient with no prior arrests. For the 1978 cohort, the results were 3.22 arrests per prisoner with no prior hospitalization; 1.89 arrests per prisoner with prior hospitalization; 2.06 arrests per patient with prior arrests; and 0.42 arrests per patient with no prior arrests. Just as Steadman and colleagues found in Albany County, New York (1978b) and statewide in New York (1978a), our rates of arrest for patients with no prior arrests in both study years are similar to or slightly lower than the general population rates. All other study groups are substantially higher than the general population with both

¹ We could not obtain arrest data for 1968 and 1978, but using a regression model, we extrapolated the values. Population figures were obtained from census reports.

prisoner groups the highest by far. These data suggest mental illness is much less important than other criminologic factors in arrest.

Third, while we would have preferred to control for additional factors potentially related to crime and violence, our data were limited. The only variables not measuring prior histories available to us were age and race. Therefore, our data are largely limited to measures of the degree to which subjects were criminally active or were treated for mental disorder, type of crime, and type of mental disorder. Even within the constraints of these types of data, there were problems. Our measures treat both arrests and hospitalizations as relatively homogenous classes of events. We did not desegregate arrests by charge because of the large number of potential categories and the small sample sizes. For similar reasons, we also ignored differences in types of mental disorder. Prior studies trying to link diagnosis and criminality have produced inconclusive results. The lack of sufficient sample sizes manifested itself in the hybrid cases, and rendered the assessment of the impact of these variables -- type of crime and diagnosis -- difficult. It might be that particular types of mental illness could explain our results, but we were unable to determine that with the constraints of our sample.

Because the results of prior studies attempting to link diagnosis with criminal behavior have produced mixed results, it is difficult to assess the bias introduced by the omission of diagnosis in this study. A recent paper by Swanson, Holzer, Ganju, and Jono (1990) suggests that mental disorder and diagnosis are related to violent behavior. Their study did not rely on hospitalization and arrest data. Instead, they used the Diagnostic Interview Schedule (DIS) to identify mental disorders by diagnostic category for a sample of adult household residents (after statistically weighing the observations, the sample size was 10,024). Five items from the DIS were used to measure violent behavior by self reports. Swanson et al. found that (1) people diagnosed with at least one mental disorder were more likely to be violent than people with no disorders, (2) people with multiple diagnoses were more likely to be violent than people with single diagnoses, and (3) violent behavior was more common among

people with certain diagnoses (e.g. substance abuse) than among people with other diagnoses (anxiety disorder). These findings suggest that the omission of diagnosis might be problematic. The study further highlights the potential problems of using arrests as the measure of criminal violence.

One problem that has been raised about our data which we feel is not an issue is the concern that arrest is not an equally valid measure of true criminality across the two populations. One could argue that biases against former inmates exist and that suspects who are former inmates are more likely to be arrested for a given act than other suspects. One could also argue that the probability that a mentally disordered suspect will be arrested differs from that for other suspects. Prior research has argued that the police are a primary mental health resource and that they do refer people for psychological treatment (Teplin, 1984). There has been work suggesting that the police's referral role has been expanding (Cohen and Marcos, 1990 and Finn and Sullivan, 1988). Cohen and Marcos reported that "the number of mentally ill individuals brought by police officers to psychiatric emergency rooms in New York City increased by 69% from 1983 to 1989." With these patterns, one might argue that the police might tend to refer mentally ill suspects to helping agencies rather than arrest them and that the probability that a mentally ill suspect will be arrested for a given act is then lower than that of other suspects.

There is, however, some evidence against the latter argument. First, as Teplin (1984) has argued, most contact between the mentally ill and the police are due to calls for assistance for the mentally ill. Second, prior work suggests that police officers are reluctant to use hospitalization as alternative treatment (Bittner, 1967; Teplin, 1984; and Teplin, 1987). Third, there is even some evidence that arrest is used as a case management tool. Teplin (1984) found that suspects who appeared to be mentally ill were 2.8 times as likely to be arrested as suspects who did not. This finding suggests that, if anything, the mentally ill are more likely to be arrested than other suspects. There were, however, no controls for the type of incident or prior histories in that study.

So, even with all of the caveats that must be placed on our data, this study revealed a rather stable pattern with prisoners with no prior mental hospitalizations consistently more often arrested than mental patients with no prior history. Again, the criminologic variables were better predictors than the mental disorder variable. Whether mental disorder functions to elevate the risk of violence in people who are not already institutionalized as prisoners or patients cannot be addressed by this study. Further, there does not appear to be support for the hypothesis that mentally disordered prisoners were a higher risk than other prisoners -- if anything, they might be lower risks. Clearly, future work demands additional comparative work with larger samples of both prisoners and mentally disordered persons, but within the same jurisdictions and during the same time periods. We need better measures of mental disorder and much greater discrimination of the types of disorder and their histories to conduct more thorough investigations of these perplexing issues.

TABLE 1. SAMPLE CHARACTERISTICS

<u>Variables</u>	<u>Prisoners</u>				<u>Patients</u>			
	<u>1968</u>		<u>1978</u>		<u>1968</u>		<u>1978</u>	
	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>	<u>N</u>	<u>%</u>
<u>Age</u>								
Under 20	48	14.3	39	11.1	8	2.3	6	1.6
20 - 30	182	54.2	192	54.5	95	27.0	147	38.7
30 - 40	81	24.1	93	26.4	82	23.3	116	30.5
40 - 50	20	6.0	21	6.0	82	23.3	67	17.6
Over 50	5	1.5	7	2.0	85	24.1	44	11.6
<i>Mean</i>		<i>27.1</i>		<i>27.7</i>		<i>39.0</i>		<i>34.4</i>
<u>Prior Incarceration</u>								
No	156	46.4	212	60.2	329	93.5	357	93.9
Yes	180	53.6	140	39.8	23	6.5	23	6.1
<i>Mean</i>		<i>0.89</i>		<i>0.78</i>		<i>0.10</i>		<i>0.11</i>
<u>Non-White</u>								
No	168	50.0	116	33.0	255	72.4	259	68.2
Yes	168	50.0	236	67.0	97	27.6	121	31.8
<u>Prior Hospital</u>								
No	286	85.1	315	89.5	155	44.0	144	37.9
Yes	50	14.9	37	10.5	197	56.0	236	62.1
<i>Mean</i>		<i>0.23</i>		<i>0.26</i>		<i>1.65</i>		<i>3.58</i>
<u>Prior Arrest</u>								
None	37	11.0	14	4.0	219	62.2	174	45.8
Non-Violent	181	53.9	174	49.4	88	25.0	128	33.7
Violent	118	35.1	164	46.6	45	12.8	78	20.5

**TABLE 2. NUMBER OF SUBSEQUENT ARRESTS PER YEAR AT RISK
FOR ANY CRIME AND FOR VIOLENT CRIME
BY COHORT**

	<u>Prisoners</u>		<u>Patients</u>	
	<u>1968</u>	<u>1978</u>	<u>1968</u>	<u>1978</u>
<u>(N)</u>	(336)	(352)	(352)	(380)
<u>Number of Arrests Per Year at Risk</u>				
<i>Mean</i>	.45	.51	.10	.15
<i>Median</i>	.29	.28	.00	.00
Percent with any arrests during follow-up	76.8	73.6	29.0	41.8
<u>Number of Violent Arrest Per Year at Risk</u>				
<i>Mean</i>	.07	.07	.01	.02
<i>Median</i>	.00	.00	.00	.00
Percent with violent arrests during follow-up	29.8	28.1	8.0	10.5

TABLE 3. FACTORS ASSOCIATED WITH ANY CRIME AND WITH VIOLENT CRIME

Variable	Prisoners						Patients									
	1968		1978		1968		1978		1968		1978					
	Any Arrest	Rate %	Violent Arrest	Rate %	Any Arrest	Rate %	Violent Arrest	Rate %	Any Arrest	Rate %	Violent Arrest	Rate %				
<u>Age</u>																
Under 20	.52 ³	91.7 ⁴	.08	33.3	.90 ³	87.2 ²	.11 ²	41.0 ²	.35 ⁴	50.0 ⁴	.00 ³	00.0 ²	.03 ²	16.7	.00 ¹	00.0 ¹
20 - 30	.50	79.7	.08	33.0	.52	73.4	.08	31.3	.19	38.9	.03	13.7	.19	47.6	.02	15.6
30 - 40	.31	71.6	.05	23.5	.39	74.2	.06	22.6	.13	34.1	.02	13.4	.16	44.0	.02	10.3
40 - 50	.38	40.0	.04	20.0	.44	61.9	.02	09.5	.05	30.5	.00	03.7	.07	35.8	.01	04.5
Over 50	.34	60.0	.08	20.0	.04	28.6	.00	00.0	.01	09.4	.00	01.2	.09	29.5	.00	04.5
<u>Prior Incarceration</u>																
No	.34	75.6	.06 ¹	24.4 ²	.47 ²	69.8 ²	.07	25.9	.10 ²	27.7 ²	.01	07.9	.13 ⁴	40.1 ³	.02 ¹	09.8 ¹
Yes	.49	77.8	.08	34.4	.58	79.3	.07	31.4	.22	47.8	.01	13.0	.41	69.6	.05	21.7
<u>Non-White</u>																
No	.33 ⁴	69.0 ²	.04 ⁴	20.8 ⁴	.43 ¹	69.0	.07	30.2	.07 ³	25.1 ³	.01 ¹	06.3 ¹	.12 ²	39.0 ¹	.01 ⁴	06.9 ²
Yes	.56	84.5	.10	38.7	.55	75.8	.08	27.1	.19	39.2	.02	12.4	.21	47.9	.03	18.2
<u>Prior Hospital</u>																
No	.45	78.7 ¹	.07	31.0	.54 ²	74.3	.07	27.6	.13	25.8	.01	07.1	.11 ²	34.7 ²	.01	09.0
Yes	.42	66.0	.06	22.0	.32	67.6	.08	32.4	.08	31.5	.02	08.6	.17	46.2	.02	11.4
<u>Prior Arrests</u>																
None	.22 ³	56.8 ³	.02 ²	13.5 ²	.20 ¹	50.0	.02	14.3	.05 ⁴	18.3 ⁴	.01 ³	05.0 ²	.04 ⁴	21.8 ⁴	.00 ⁴	02.3 ⁴
Non-Violent	.45	76.8	.05	28.7	.54	75.3	.07	28.2	.20	42.0	.01	10.2	.19	55.5	.01	12.5
Violent	.51	83.1	.10	36.5	.51	73.8	.09	29.3	.18	55.6	.03	17.8	.30	64.1	.06	25.6

¹p < .1; ²p < .05; ³p < .01; ⁴p < .001

TABLE 4. SUBSEQUENT RATES OF ARREST

		<u>1968 COHORTS A</u>				<u>1978 COHORTS B</u>					
		Mean	Median	Mean Rank	Sample Size	Group	1	2	3	4	
									<u>Multiple Comparisons¹</u>		
.45	.31	453.15			286	Prisoners w/o Mental Hospitalizations (1)	---		**	**	
.42	.22	406.53			50	Prisoners with Mental Hospitalizations (2)	---	---	**	**	
.20	.00	306.44			133	Patients with Arrests (3)	---	---	---	*	
.05	.00	211.56			219	Patients w/o Arrests (4)	---	---	---	---	
<u>1978 COHORTS B</u>											
.54	.32	459.05			315	Prisoners w/o Mental Hospitalizations (1)	---		**	**	
.32	.13	396.95			37	Prisoners with Mental Hospitalizations (2)	---	---	---	**	
.23	.10	346.49			206	Patients with Arrests (3)	---	---	---	**	
.05	.00	216.18			174	Patients w/o Arrests (4)	---	---	---	---	

¹*p < .1; **p < .05; --- not applicable or redundant
 (A Overall Test Results: X² = 216.67; p < .001)
 (B Overall Test Results: X² = 163.950; p < .001)

TABLE 5. PROBABILITY OF SUBSEQUENT ARREST

Sample Size	Percent Arrested	Odds Ratio	Adjusted Odds Ratio	Group	Multiple Comparisons ²			
					1	2	3	4
<u>1968 COHORTS A</u>								
287	78.7	16.50	9.03	Prisoners w/o Mental Hospitalization (1)	---	---	**	**
50	66.0	8.69	6.82	Prisoners with Mental Hospitalization (2)	---	---	---	**
133	46.6	3.91	4.15	Patients with Arrests (3)	---	---	---	**
219	18.3	1.00	1.00	Patients w/o Arrests (4)	---	---	---	---
<u>1978 COHORTS B</u>								
315	74.3	10.34	7.79	Prisoners w/o Mental Hospitalization (1)	---	---	---	**
37	67.6	7.46	7.03	Prisoners with Mental Hospitalization (2)	---	---	---	**
206	58.7	5.09	5.63	Patients with Arrests (3)	---	---	---	**
174	21.8	1.00	1.00	Patients w/o Arrests (4)	---	---	---	---

¹ The percentage arrested and the odds ratio are those values before adjusting for age and race. The adjusted odds ratio are the estimates from the logistic regression model to that individual age and race as covariates.

² *p < .1; **p < .05; --- not applicable or redundant

(A Overall Test Results: $\chi^2 = 247.682$; $df = 5$; $p < .001$)

(B Overall Test Results: $\chi^2 = 152.501$; $df = 5$; $p < .001$)

TABLE 6. SUBSEQUENT RATES OF CRIMINAL VIOLENCE

		<u>1968 COHORTS A</u>				<u>1978 COHORTS B</u>			
<u>Mean</u>	<u>Median</u>	<u>Mean Rank</u>	<u>Sample Size</u>	<u>Group</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>Multiple Comparisons¹</u>
.07	.00	389.89	286	Prisoners w/o Mental Hospitalizations (1)	---	---	**	**	
.06	.00	358.55	50	Prisoners with Mental Hospitalizations (2)	---	---	---	---	
.02	.00	321.21	133	Patients with Arrests (3)	---	---	---	---	
.01	.00	296.16	219	Patients w/o Arrests (4)	---	---	---	---	
.07	.00	400.24	315	Prisoners w/o Mental Hospitalizations (1)	---	---	---	**	
.09	.00	421.46	37	Prisoners with Mental Hospitalizations (2)	---	---	---	**	
.03	.00	357.14	206	Patients with Arrests (3)	---	---	---	*	
.00	.00	304.82	174	Patients w/o Arrests (4)	---	---	---	---	

¹p < .1; **p < .05; --- not applicable or redundant
 (A Overall Test Results: X²=65.01; p < .001)
 (B Overall Test Results: X²=54.93; p < .001)

TABLE 7. PROBABILITY OF SUBSEQUENT CRIMINAL VIOLENCE

Sample Size	Percent ¹ Violent	Odds Ratio	Adjusted Odds Ratio	Multiple Comparisons ²			
				Group	1	2	3
<u>1968 COHORTS A</u>							
287	31.1	8.53	4.94	Prisoners w/o Mental Hospitalization (1)	---	---	**
50	22.0	5.32	4.11	Prisoners with Mental Hospitalization (2)	---	---	**
133	12.8	2.77	2.72	Patients with Arrests (3)	---	---	*
219	5.0	1.00	1.00	Patients w/o Arrests (4)	---	---	---
<u>1978 COHORTS B</u>							
315	27.6	16.21	11.20	Prisoners w/o Mental Hospitalization (1)	---	---	**
37	32.4	20.39	20.79	Prisoners with Mental Hospitalization (2)	---	---	**
206	17.5	8.99	10.52	Patients with Arrests (3)	---	---	**
174	2.3	1.00	1.00	Patients w/o Arrests (4)	---	---	---

¹ The percentage arrested and the odds ratio are those values before adjusting for age and race. The adjusted odds ratio are the estimates from the logistic regression model to that individual age and race as covariates.

² *p < .1; **p < .05; --- not applicable or redundant

(A Overall Test Results: $X^2 = 89.050$; $df = 5$; $p < .001$)

(B Overall Test Results: $X^2 = 90.551$; $df = 5$; $p < .001$)

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