THE EFFECTS OF TREATMENT:
A STATISTICAL INVESTIGATION

Prepared by
Research and Information Systems
Minnesota Department of Corrections
November, 1977

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Summary

1. The report is a follow-up on the post-institutionalization behavior of a random sample of juveniles admitted to state juvenile institutions in 1973-1974.

2. A previous study of the decision making process in juvenile institutions using these juveniles as subjects concluded that the decision whether or not to commit a juvenile to the treatment program of an institution was extremely haphazard and/or arbitrary. It also concluded empirically that most juvenile attributes are not related to whether or not juveniles are institutionalized.

3. More than half (55%) of the juveniles at the State Training School spent more than two hundred days in the institution (not counting the diagnostic evaluation periods). Only twenty-six percent of Minnesota Metropolitan Training Center and nineteen percent of Minnesota Home School subjects stayed for that long a time.

4. Twenty-four months after each juvenile's release from the institution - whether by parole or probation - it was found that sixty percent had not returned to a state juvenile or adult correctional institution; twenty-seven percent had one such recommitment and eleven percent had multiple recidivisms. The institution with the highest return rate was Minnesota Metropolitan Training Center (51%); Minnesota Home School (29%) and State Training School (31%) rates were similar. Urban-rural differences may account for these institutional differences to an unknown extent.

5. Of those juveniles placed on institutional probation, fifty-one percent recidivated as compared to thirty-seven percent of those institutionalized.

6. Multivariate analysis (multiple linear regression) showed no significant relationship between length of institutionalization and subsequent recidivism when other factors were controlled statistically. In other words, all other things being equal, no advantage to longer periods of institutionalization was shown.

7. Only the age of the juvenile when committed was consistently and significantly related to subsequent recidivism - older juveniles were less likely to be recommitted.

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This report serves two purposes. The first purpose is as a follow-up study of the sample of juvenile offenders described in an earlier investigation (Decision-Making in Juvenile Correctional Institutions: Research Summary and Recommendations by David Chein, Minnesota Department of Corrections, 1976). The second purpose is to investigate statistically what characteristics of the individual, his/her offense or his/her treatment are associated with subsequent recidivism.

Part One: The Original Research

Noting that the concept of deviance involves a societal response as well as a deviant act, David Chein set out to examine how societal behavior norms are enforced by institutionalized agents of social control.

Specifically, the study was conducted to determine the criteria which are used by staff members of juvenile correctional institutions in making decisions regarding juveniles.

"The particular focus of this study was on decision-making within juvenile correctional institutions. Institution staff are given the task of deciding whether to detain juveniles who are committed to the institution or whether or not to return them to the community on probation. For those juveniles who are kept in the institution, the staff is given the task of deciding when and with what conditions or stipulations to return the juvenile to the community on parole. These two decisions were the focus of the study". (Chein, 1976, p.4)

Design

The research consisted of four styles of investigation.

1. A quantitative content analysis of staff reports on individual juvenile cases. A random sample of 214 (25%) of all juveniles committed to state institutions for diagnostic evaluations between January 1, 1973 through June 30, 1974 were examined. Information was gathered on the quantitative variables sex, age of commitment, race, size and location of home town, and previous correctional history. Qualitative information was gathered on the nature of the juvenile's home environment, his attitude or demeanor as well as educational and psychological variables; this information was quantified in the form of rating scales. Finally, the decision of whether to institutionalize the individual and his/her resulting length of stay in the institution (if applicable) were noted. An assessment was then made to see how the above factors related to disposition of cases and length of institutionalization.

It is the above analysis that is the focus of the follow-up report. For the record, the other analyses made by Chein include:

2. A questionnaire administered to staff which asked them to rank several decision-making factors;

3. A decision game; and

4. Systematic observation of actual staff meetings.

Findings

Summary of Research Findings.

1. The staff at juvenile institutions have difficulty naming the most important criteria they use to make decisions.
2. The staff see the juvenile's offense and attitude as the most important factors in deciding whether to institutionalize juveniles.

3. The staff see the attitude and growth of the juvenile as the most important factors in deciding whether to parole a juvenile.

4. There is no relationship between the juvenile's offense and the disposition of his case at either the State Training School or the Minnesota Home School.

5. Status offenders stay slightly longer in the institution than serious offenders; whites stay longer than non-whites; juveniles at the State Training School stay longer than juveniles at the other two institutions.

6. All in all, there are no consistent or systematic criteria used in making decisions about whether or not to institutionalize and when to parole juveniles.

7. The availability of community placements, and the presence of a caseworker to secure them for juveniles, are two factors which will greatly influence the decision of the staff.

8. There is a general presumption by institutional staff that juveniles committed to the Department of Corrections for evaluation are in need of institutionalization. Only in exceptional cases is probation granted.

9. The Action Panel confirms staff recommendations in over 95% of its decisions.

Part Two: The Original Data

As mentioned above, Chein analyzed the contents of official institutional files of 214 juveniles admitted to state correctional institutions for diagnostic evaluations. This represents a random sample of twenty-five percent of all such admissions between January 1, 1973 through June 30, 1974. It should be noted that members of minority races were proportionately over-sampled to insure adequate numbers for statistical analyses. Subsequent to Chein's original report, two individuals were removed from the sample because they represented unique circumstances unsuited to the purposes of the following investigation. These individuals were out of state juveniles who were transferred to other jurisdictions. The remaining 212 are described in Tables 1 through 3.

Table 1 describes the sex, race and age of these individuals by institution of original commitment.

Table 1 shows that this sample is primarily male (77%), white (64%) and 15 or 16 years of age (55%). Minnesota Metropolitan Training Center (MMTC) received the most individuals, 86 or 41%; the State Training School (STS) received 65 (31%) and the Minnesota Home School (MHS) received the least, 61 or 29%. The Minnesota Home School has the highest proportion of females (30%) as compared to MMTC (21%) and STS (19%). Blacks make up about one-third of all MMTC commitments but were less than two percent at STS and non-existent at MHS (0%). American Indians were distributed more evenly among the three institutions ranging from 11% of STS admissions through 16% of MMTC admissions and 28% of MHS juveniles.

One final word concerning institution of commitment. Assignment to a specific institution was made on a geographic basis during this time period (1973-1974). That is, the county of commitment (almost always the county of residence) determined to which institution the individual would be committed. Those juveniles from the major urban counties of Hennepin, Ramsey, and Anoka went to MMTC; the remaining counties were divided into an Eastern Region (STS) and a Western Region (MHS).

TABLE I: Sex, Race and Age by Institution

	MMTC		STS		MHS		Total	
	N	%	N	%	N	%	N	%
Sex								
Male	68	79	53	82	43	71	164	77
Female	18	21	12	19	8	30	48	23
Race								
White	39	45	53	83	42	69	135	64
Black	29	34	1	2	0	0	30	14
Indian	14	16	7	11	17	28	38	18
Other	4	5	3	5	2	3	9	4
Age								
12-14	13	15	15	23	11	18	39	18
15	14	16	13	20	18	30	45	21
16	34	40	21	32	17	28	72	34
17-18	25	29	16	25	15	25	56	27
Totals	86 (41%)	100*	65 (31%)	100*	61 (29%)	100*	212 (100%)	100

*In this, and subsequent tables, percentages summed may not precisely equal 100% due to rounding error.

Table 2 describes, for each institution, the number of juveniles who were subsequently institutionalized versus the number who were released on institutional probation status after the diagnostic period. (Table 2 - see Page 5.)

For all institutions, the majority of juveniles admitted for diagnostic evaluations are routed through that institution's programming rather than recommended for probation. Chein noted that a smaller percentage of juveniles are institutionalized at MMTC (71%) than at STS (88%) or MHS (82%). This difference (when MHS and STS are combined) is statistically significant at the .005 level. He attributed this to "the greater availability of community programs in the metropolitan area, and the use of a caseworker who is more aware of these options". (Chein, 1976, p. 24). When analyzed by breaking down percentage institutionalized by status and non-status community offenses, the difference disappeared for non-status offenses. A similar breakdown by sex further noted that the percentage institutionalized differed among institutions only for females. Thus there were significant differences of percentage institutionalized among institutions only for female status offenders; due probably to a greater number of group homes for females in the Twin Cities area -- the area served by MMTC.

Some of the other relationships between juveniles' attributes and disposition decisions are shown in Table 3. (From Chein, 1976, pp. 28-29). (Table 3--see Page 5.)

Based on these results, Chein concluded that:

> "On the whole the table shows that most juvenile attributes are not related to whether or not juveniles are institutionalized." (Chein, 1976, p.2).

The findings relating to sex and committing offense are discussed above as they relate only to MMTC.

TABLE 2: Disposition Decision by Institution

	Institutions							
	MMTC		STS		MHS		Total	
Disposition Decision	N	%	N	%	N	%	N	%
Probation	25	29	8	12	11	18	45	21
Institutionalization	61	71	57	88	50	82	167	79

TABLE 3: Determinants of Disposition Decision

		Percent Institutionalized	Statistical Significance*
Race:	White	81	P = .06
	Black	73	(White vs.
	Indian	76	Non-White)
	Other	78	
Sex:	Male	82	P = .03
	Female	67	
Age:	12-14	74	P = .53
	15	73	
	16	80	
	17-18	84	
Size of Home Community	under 30,000	80	P = .56
	over 30,000	76	
Most Serious Offense Committed	Serious & Drug	78	P = .80
	Status	77	
Commitment Offense	Serious & Drug	83	P = .03
		67	
Reading Aptitude	Above Average	76	P = .83
	Average	78	
	Below Average	81	
Attitude of Community	Negative	88	P = .26
	Non-Negative	77	
Psychological Profile	Normal or Mild Problems	76	P = .63
	Disturbed	84	
	Sociopathic	80	
Prior Treatment Experiences	None	84	P = .22
	One or More	76	
Family Home Environment	Good	77	P = .30
	Poor	84	
Use of Drugs	No	76	P = .55
	Yes	80	
Attitude and Demeanor	Good	76	P = .67
	Poor	81	
Child Doesn't Possess Insight	True	83	P = .01
	False	65	

*Based on Chi-Square tests of statistical significance. Results are said to be statistically significant if their probability of occurring by chance (P) is .05 or less.

He also concluded that neither size of community, parents' occupations nor parents' education is related to disposition; nor were the most serious offenses ever committed, intelligence or scholastic aptitudes, the psychological profile of the juvenile, use of drugs, prior treatment experiences, the child's attitudes, and the quality of the family/home environment. Only one item -- staff perception of the individual's possession of insight -- from the Dimension Scale as well as one item from the Family Home Environment Scale -- Parents' ability to control the child -- were significantly related to disposition in the predicted directions.

Chein concluded then that the decision whether or not to commit a juvenile to the treatment program of an institution was extremely haphazard and/or arbitrary.

> "The staff is correct when they claim to be judging each case on its own, but they are not applying any consistent criteria to their decisions." (Chein, p. 35.)

Part Three: The Follow-Up

Method

The subjects in the study discussed above were followed up by the Research Unit of the Minnesota Department of Corrections during June of 1977. The Department's computerized and manual files of the 212 subjects were examined and all incidences of recidivism -- return to a juvenile institution due to revocation of probation/parole or due to recommitment as well as all commitments to adult correctional institutions -- were noted for the two year period following institutional release (probation and parole). (In addition, certain data concerning the individual's previous court histories not included in the original study were collected.)

Although recommitment data available to the Department were usually limited to those occurring within the State of Minnesota, where information concerning extra-state commitments was available such recidivism events were included. Finally, all recommitments -- whether juvenile or adult, whether through revocation or new court commitment -- were weighted equally and all recidivism events for each individual during the follow-up period were summed to provide the number of recommitments described below.

The Data

Subsequent to the original treatment decision made by the institution's Action Panel (whether to release the juvenile on probation status or to commit to the institution's residential program) the actual physical disposition of each youngster is additionally affected by a continuum of decisions made by the institution staff (among others). As evidence of this fact during the follow-up study, it was found that twelve (27%) of the 45 juveniles who were ordered by the Action Panel to be placed on probation actually went instead into an institutional program for periods ranging from five days to six months before parole. (In each of those cases, the original decision was probation to a group home placement; such placement then fell through causing the institution to commit the youngster to institutional programming.)

Thus, the follow-up study constructed a single variable called Number of Days in Treatment which represents the sum or product of all institutional decisions concerning when each juvenile should be released to the community. It consists of the number of days between the individual's diagnostic evaluation (usually two to three weeks after his admission) and his release by probation or parole. Since those released by probation took no part in the institutional treatment program per se, the variable was defined as equal to zero in each such disposition of probation. Thus it is greater than zero only for juveniles who were given institutional programming and reflects the number of days subsequent to diagnostic evaluation and before release by parole. Note that all juveniles -- whether released by probation or parole -- experienced a comparable, although unmeasured, period of institutional residence during diagnostic evaluation.

The sum of all treatment decisions, "Days in Treatment", is displayed in Table 4, broken down by Institution of Commitment. It must also be pointed out

that in a few cases the institution of commitment may have transferred the individual to a different state institution prior to parole release -- these transfers are not reflected in the follow-up study and must be regarded as sources of error. Since such transfers were uncommon, this error is assumed to be small and the results are not believed to have been appreciably affected.

TABLE 4: Days in Treatment by Institution of Commitment

	Institution							
	MMTC		STS		MHS		Total	
Days in Treatment	N	%	N	%	N	%	N	%
0 (Probation)	17	20	8	12	8	13	33	16
1-50 (Program)	10	12	1	2	3	5	14	7
51-100	19	22	1	2	15	25	35	17
101-200	18	21	19	29	24	39	61	29
201-300	13	15	17	26	7	12	37	18
301-719*	9	11	19	29	4	7	32	15
	86	100	65	100	61	100	212	100

*Extreme cases include individuals with multiple escapes as well as frequent unsuccessful temporary paroles.

Table 4 shows considerable differences among institutions concerning the length of time spent in program for these juveniles. While over half (55%) of STS juveniles spend more than 200 days in the institution (due to their particular treatment philosophy ("Positive Peer Culture") which is said to require longer stays), only about one-quarter (26%) of MMTC juveniles and one-fifth (19%) of MHS commitments spend that much time at the institution. For the population as a whole, however, the mean is 159.3 days.

The second follow-up variable is a measure of total recidivism after release. A follow-up period of 24 months following institutional release (probation or parole) was chosen; for 210 of the 212 juveniles these two years have elapsed. The records of the Minnesota Department of Corrections (computerized and manual) were searched to record for each individual the number of reinstitutionalizations -- adult as well as juvenile -- which occurred during the time period. This variable is the simple sum of all reinstitutionalizations and is termed the "Number of Recidivism Events". This variable is summarized by institution as well by probation/institutionalization disposition in Tables 5 and 6.

TABLE 5: Number of Recidivism Events by Institution

Number of Recidivism Events	Institution MMTC N	%	STS N	%	MHS N	%	Total N	%
0	40	47	45	69	43	71	128	60
1	27	31	15	23	16	26	58	27
2-4	17	20	5	8	2	3	24	11
Unknown	2	2	0	-	0	-	2	1
Total	86	100	65	100	61	100	212	100

Table 5 reveals that from the 212 randomly selected juvenile commitments, 128 (60%) have not returned to a Minnesota Correctional Institution within two years of release; fifty-eight (27%) have had one such recommitment; and twenty-four (11%) have multiple recommitments. Two individuals are reported as "unknown" due to the fact that their follow-up period has not yet fully elapsed. Neither has yet been recommitted. Thus, the recommitment or recidivism rate for this sample is 39%.

There are striking differences among institutions in recidivism rates: whereas only 29% of MHS juveniles and 31% of STS juveniles have been recommitted, over half (51%) of MMTC admissions have recidivated. Furthermore, over three times as many MMTC commitments (20%) had multiple recommitments as the other two institutions combined (6%).

It must be noted that it would be hazardous to infer differences in the quality of programs among institutions based on Table 5. Because of the fact that assignment to institution was based on county of commitment (residence) for this sample, urban/rural differences in juvenile characteristics may account for a substantial proportion of the institutional differences in Table 5. In fact, Table 5 could almost as well be labeled "Number of Recidivism Events by County of Residence" substituting Hennepin, Ramsey and Anoka for the column header MMTC, "Eastern-Rural" for STS and "Western-Rural" for MHS. To put it simply: because of institutional assignment by county of commitment, program differences and metropolitan-non-metropolitan area differences are hopelessly confounded and cannot be adequately separated.

TABLE 6: Number of Recidivism Events by Disposition

Number of Recidivism Events	Disposition Probation N	%	Parole N	%	Total N	%
0	16	49	112	63	128	60
1	12	36	46	26	58	27
2-4	5	15	19	11	25	12
Unknown	0	-	2	1	2	1
Total	33	100	179	100	212	100

Table 6 shows that 51% of these juveniles placed on probation recidivated during their follow-up periods while only 37% of those institutionalized recidivated during the same period of risk. But it must be pointed out that the problems concerning geographical assignment to institutions mentioned above in reference to Table 5 may be operating concerning the relationships shown in Table 6. A greater proportion of MMTC juveniles are released on probation, a greater proportion of MMTC juveniles recidivate; however, we cannot be sure if the difference in Table 6 (as well as Table 5) are due to differences in program among institutions, to an urban/rural difference in juveniles or to differences between probation and parole. An analysis of these 33 juveniles released on institutional probation -- i.e. not exposed to full institutional programming -- showed no significant differences in recidivism between metro and non-metro juveniles. Clearly, a more powerful method of analysis is needed to provide clear answers.

A Statistical Investigation into the Correlates of Recidivism

Chein's work measured the actual criteria used by state correctional institution staff members in making decisions concerning whether juveniles should be institutionalized. The explicit purpose underlying juvenile correctional institution programming is to "reduce and control juvenile crime"; (MDOC, 1977, p. 6.) implicitly as well, juvenile programming attempts to forestall individual's entry into adult crime. The measure of effectiveness of this type of purpose available to most researchers is <u>recidivism</u> -- the return to correctional institutions due to illegal behavior. If the actual correlates ("causes") of juvenile recidivism could be identified it is hoped that such knowledge will be useful to institutions in treating youngsters. Specifically, a comparison of these determinants of recidivism to both the expressed and actual criteria used by program staff when making treatment decisions could improve such decision-making.

There are two requirements for a study of this type.

1) A model which purports to show how one or more variables (e.g. characteristics of the juvenile, his socio-economic status or his length of time spent in treatment) "cause" or are correlated with recidivism. Since recidivism is subsequent to both the juveniles' characteristics and upbringing, as well as the treatment administered by the program, any observed correlation between these variables and recidivism is taken to be "causal", that is, we may say these variables affect (to some degree) subsequent recidivism;

2) A method of describing numerically the <u>unique</u> affect (correlation) of each possible causal variable on recidivism.

The Model

Traditionally it has been assumed that treatment affects recidivism in a desired direction -- negatively. However, it is also admitted that no treatment can be 100% responsible for a person's behavior -- thus, when examining the effects of treatment on recidivism one must also take into account other variables'

independent effect on recidivism -- such variables may include the persons' cultural backgrounds, physical characteristics, etc. Such a model is represented by the diagram in Figure 1.

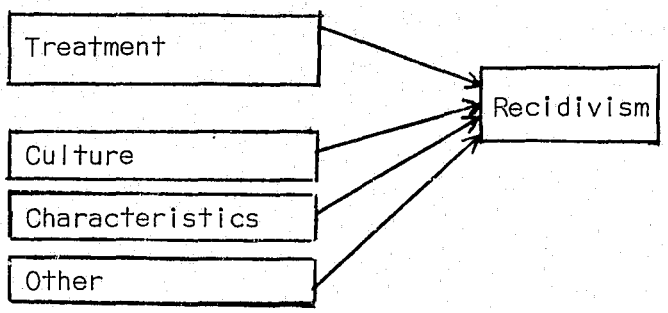


Figure 1.

Table 7 describes the list of "background variables" - variables independent of treatment which may be related to recidivism and are available to this analysis.

TABLE 7: Variables Independent of Treatment

Sex
Race
Residence
Age
Scholastic Achievements (Math, Reading)
Prior Juvenile Correctional History
Attitude and Insight into Own Problems
Psychiatric Problems
Drug Use
Family Background
Community Reaction to Youth's Offense

Thus, by measuring the relationship of each of these types of variables to recidivism, we arrive at these relationships. However, it is known that many of these background variables are related to one another, and this can hide or inflate the relationship of each to recidivism. For example, we know that race and residence can be related in Minnesota -- almost all Blacks live in the metropolitan cities. Thus, we cannot be sure if the measured correlation between race and recidivism is, in fact, due to the correlation between residence and recidivism. We must, in any non-experimental study, statistically control for the effects of each on the others' relationship to recidivism.

It was found that the uncontrolled relationship of "number of days in treatment" with "number of recidivism events" equals -.16 (statistically significant at the p=.01 level) signifying a slight-to-moderate negative relationship (the greater the length of institutionalization, the less the recidivism). But the interaction of treatment and recidivism with the other determinants of recidivism (which may determine the length of treatment as well

as the subsequent recidivism) is uncontrolled. In other words, is the measured relationship between amount of treatment and recidivism due to the treatment, or to the fact that those children who are less likely to recidivate automatically get less treatment (which is what the diagnostic process intends to do)? We cannot tell unless we control for these interacting factors.

Uncontrolled relationships (measured by Pearson's r as well as Spearman's Rho -- both bivariate correlations) are presented in Appendix A.

A statistical method which can remove the interactions of causal variables on each's relationship to recidivism will give us the unique and independent effect of length of juvenile institutionalization on the subsequent recidivism of this sample of juveniles. The statistical method most commonly used to control for such confounding intercorrelations and to preserve the unique relationship of each variable to the result (in this case recidivism) is Multiple Linear Regression.

This technique requires that we make certain assumptions about the data and the sample.

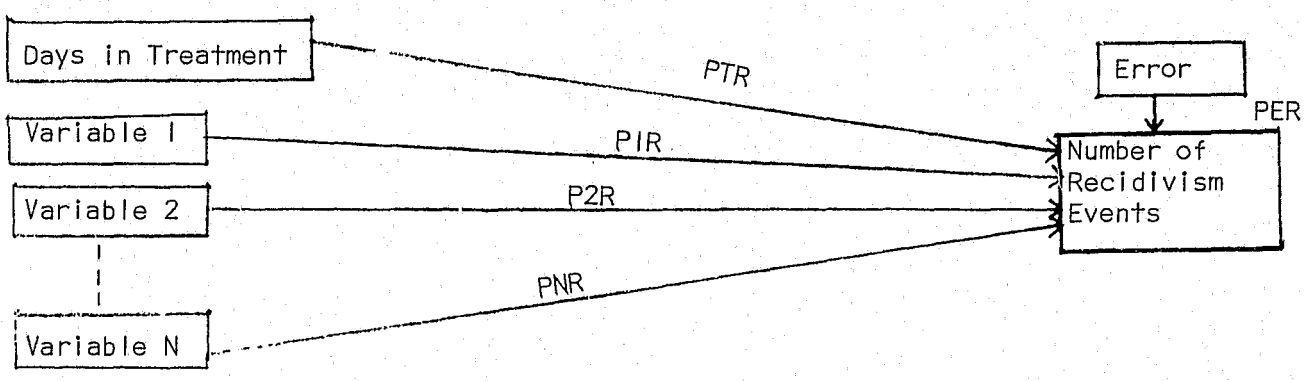
1) Data - a) The variables measured relate linearly to each other and to the result,
b) Each variable consists of interval level data and is distributed normally about its mean,
2) The sample was chosen randomly from a known population.(Nie, 1975)

In the following analysis assumptions about the linearity of relationships is taken for granted although some spot-checking of critical relationships showed no significant departure from the assumption. Further, some ordinal level data were treated as interval data as is common practice. (Asher, 1976). In addition some nominal data (sex, race) were transformed to dummy variables (values of 0 and 1) as is generally accepted practice. (Nie, 1975.)

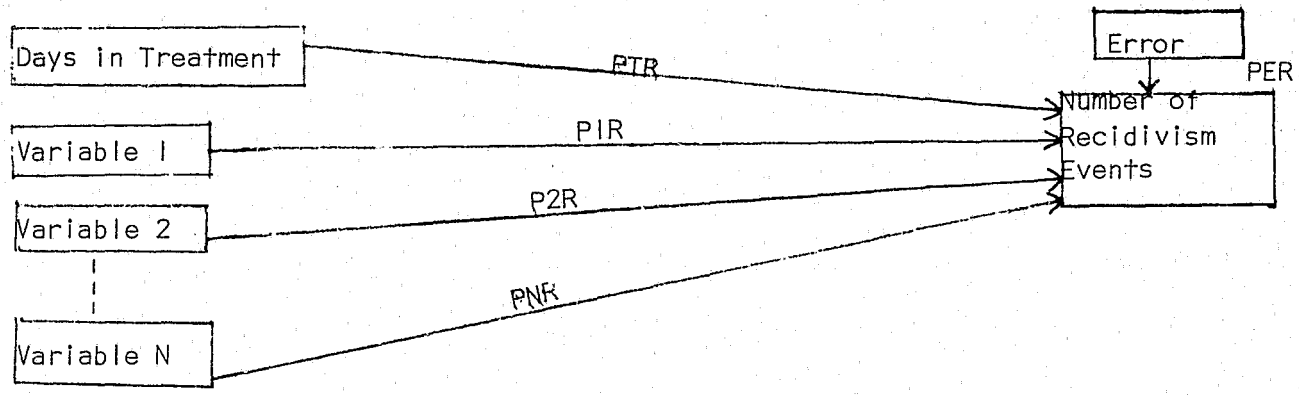
Regression analysis in essence combines the effects of all independent variables to produce an equation which can be used to predict the dependent (result) variable. In doing this it "partials out" the effects of interrelations among variable to preserve the <u>unique</u> contribution of each variable to the result. (Nie, 1975.)

The sample was randomly selected from a known population but because institutional assignment was made on the basis of geographic residence (as mentioned above) it generates a problem of extreme multicolinearity between residence and institution of admission. Therefore, the sample was separated by institution; into one sample went all MMTC admissions (all Hennepin, Ramsey and Anoka County residents) and into the other sample were combined the out-state county (STS and MHS) juveniles. Then separate regression equations were derived for each sample, resulting in a measure for each relationship for each of two samples. The extent to which the two solutions converge will determine the generalizability of results to the entire population.

The result model now appears as Figure 2.



For MMTC Juveniles



For STS, MHS Juveniles

Figure 2.

In Figure 2 variables 1 through N signify the background variables (individual characteristics, residences, history of offense, etc.) mentioned earlier. PTR, PIR, etc. signify the relative strengths of relationship (effect) of each variable on outcome. Error is seen as the sum of all unknown and unmeasured variables which affect recidivism as well as the measurement error resulting from variables 1 through N; PER is the relative effect on recidivism unexplained by the variables in the model. PTR, PNR and PER are called path coefficients and are measured by the Beta weights generated by the Regression Analysis. The Null hypothesis then explicitly tested is that the length of treatment has no effect on subsequent recidivism. In order to reject this hypothesis, we wish to be 95% certain that, given the limits of the data, the size of the sample and the laws of probability, the results were not obtained by chance. Therefore, tests of statistical significance were performed at the $p=0.05$ level on the resulting solutions.

TABLE 8: Relationships with Recidivism

Variable	MHS, STS	MMTC
Age	-.45 (p=.001)	-.20 (p=.01)
Sex (1=Male)	-.14 (p=N.S.)	.18 (p=N.S.)
Race: White	-.28 (p=.001)	-.03 (p=N.S.)*
Black	-.16 (p=.001)	.04 (p=N.S.)*
Indian	-.27 (p=.001)	.05 (p=N.S.)*
Other	0* *	0 * *
Size of Home Community	-.06 (p=N.S.)	.00 (p=N.S.)
Reading Aptitude (1=below average)	.14 (p=.01)	.07 (p=N.S.)*
Math Aptitude (1=below average)	.19 (p=.001)	.12 (p=N.S.)
Age at First Court Contact	-.02 (p=N.S.)	.08 (p=N.S.)*
Number of Previous Court Contacts	-.22 (p=.001)	-.04 (p=N.S.)*
Number of Prior Correctional Commitments	.12 (p=.05)	.10 (p=N.S.)*
"Poorness" of Family Home Environment	-.01 (p=N.S.)	-.19 (p=.05)
Severity of Drug Use	.08 (p=N.S.)	.05 (p=N.S.)*
Poorness of Attitude During Diagnostic Evaluation	.13 (p=.05)	.00 (p=N.S.)*
Seriousness of Offense Record	.32 (p=.001)	-.06 (p=N.S.)*
Existence and Severity of Psychiatric Problems-	.01 (p=N.S.)	-.22 (p=.01)
Lack of Insight	.05 (p=N.S.)	-.01 (p=N.S.)*
Juvenile Requested Own Institutionalization	.00 (p=N.S.)	.07 (p=N.S.)*
Negativeness of Community Response to Juvenile	.06 (p=N.S.)	-.15 (p=N.S.)*
Number of Days in Institutional Treatment	-.08 (p=N.S.)	-.05 (p=N.S.)
(Combined Effect of all Measured Variables)	Multiple Correlation= .65 (p=.001) (R)	Multiple Correlation= .42 (p=.05) (R)
Error (Combined Effect of all Unmeasured Variables and Measurement Error)	Multiple Correlation= .75 (R)	Multiple Correlation= .91 (R)

(Statistical significance where N.S. signifies lack of statistical significance.)

*Not included in final solution due to insignificant effect on recidivism.

**By definition.

Testing the Hypothesis

Table 8 (Page 14) describes the path cooeficients for the variables (including number of days in treatment) for MHS and STS juveniles as well as MMTC juveniles. The coefficients (also known as Beta coefficients) range from -1 to 1 with values close to zero indicating no relationship; -1 meaning a perfect negative relationship and +1 a perfect positive relationship. Only those coefficients which are statistically significant at the p=.05, p=.01 or p=.001 level should be regarded as sufficiently distinguishable from zero.

Table 8 shows that, in terms of the models for each sample (MMTC and MHS-STS), the Error terms (coefficients of .91 and .75) are more strongly related to recidivism than the combined relationships of all known variables. Clearly, the data are not successful in describing the bulk of the causes of recidivism; the equations adequately describe less than half the observed variance in recidivism. This may be due to too small a sample, invalid or poorly chosen variables, or chance error.

Of that smaller proportion of effect which is described by the model, we note that only the effect of age on recidivism is large and statistically significant for both samples. The negative coefficients show that older juveniles recidivated less than younger juveniles (when all other factors are controlled statistically). This may be seen, at least partially, as an effect of the legal age of majority (18 years in Minnesota) and the fact that adult recidivism probably is less frequent within a two year period. Adult court proceedings may be lengthier and resulting adult sentences are longer, thus reducing the risk of recommitment during the follow-up period. In addition, adults may be more likely to leave the State.

Other than age, no variables are significantly related to recidivism in both samples. Sex is near significant (p=.06) as a factor for MMTC juveniles and is moderate in strength, showing that MMTC males recidivated more often than females.

Race shows no effect for the MMTC group but large effects for the STS-MHS sample. Because of the way the categorical variable race was decomposed into three dummy variables and one reference category, we must view the individual race components only in relation to one another. In doing so, we find that whites were significantly less likely to recidivate than blacks and "others". However, there was such a low number of blacks and others in these two institutions that their coefficients may indeed be due to chance alone, despite their observed statistical significance. It is wisest to sum up racial effects by stating that the data shows no difference between whites and Indians at MHS and STS.

Scholastic achievement/aptitude deficiencies in reading and math (measured on standardized performance tests given during the diagnostic phase) show effects which are significantly and positively related to recidivism for the out-state institutions and, although not significant, were in the same direction at MMTC. Other research into adolescents have shown deficiencies in reading and math achievement to be independently correlated with behavior problems. (Hirschi, 1969.)

Opposite effects on recidivism were noted for the non-MMTC group by the number of previous court contacts and the number of previous correctional commitments. Apparently those previously seen often by juvenile courts did well on release while those with previous institutionalizations had a poor prognosis. At MHS and STS greater seriousness of previously committed offenses marked candidates for recommitment.

Only from MMTC did those individuals with known psychiatric problems recidivate significantly more often. Perhaps the diagnostic procedures differed between institutions on this variable.

Finally, the effect of differential lengths of treatment, for each institutional group independent of the other, is shown to be slight and not statistically significant; in other words, not sufficiently distinguishable from zero effect. We, therefore, cannot reject the null hypothesis and must conclude that, all other things being equal, there is no advantage to longer periods of institutional treatment in reducing recidivism.

It must be noted that since each individual received some form of institutional treatment or probation supervision, the above conclusion cannot be construed to mean that treatment has no effect; simply that longer periods of institutional treatment have no observable advantage over shorter periods.

Conclusions

The conclusion that length of time in institutional treatment, all other factors being equal, did not have an impact on subsequent reinstitutionalization confirms the findings made in an earlier, experimental, study conducted by the Minnesota Department of Corrections. (MDOC, 1976.) In this study consisting of random assignment to short-term and long-term treatment, no substantive differences in recidivism were noted upon twenty month follow-up. The results of these two studies together support the cost-effectiveness of short-term residential treatment.

In regards to the factors that were shown to be related significantly to recidivism the policy implications are less clear. This is for two major reasons:

1) The fact that the sample was assigned to institutions on the basis of county of residence means the most relevant residential factor (urban/rural differences) was so thoroughly confounded with possible program differences that no clear assignation of effect can be drawn between those two variables and subsequent recidivism. Furthermore, the possibility that these factors (urban/rural differences and differences among programs) could have altered the findings had they been more adequately controlled must be acknowledged.

2) Those factors which emerged from the analysis as significantly related to recidivism varied much between the sub-samples; and the cause of variation cannot be safely assigned to either urban/rural differences, programmatic differences or any combination of the two.

Finally, the significant factors are generally not of the type that are generally amenable to intervention. However, staff members may be well advised to give those factors more serious consideration when making treatment decisions.

APPENDIX A

Variables		Pearson r (n) (p=significance) Disposition (probation=0 institution=1)	Days in Treatment	Outcome (no recidivism=0 recidivism=1)	Number of Recidivism Events	Spearman Rho (n) (p=significance) Disposition	Days in Treatment	Outcome	Number of Recidivism Events	Beta (n) (p=significance) STS, NHS Days in Treatment	STS, NHS Number of Recidivism Events	NHTC Days in Treatment	NHTC Number of Recidivism Events
Sex	CA5 (Dummy: 1=male)	.17 (212) (p=.006)	.02 (212) (p=.39)	.05 (210) (p=.25)	.04 (210) (p=.27)	.17 (212) (p=.005)	.09 (212) (p=.10)	.05 (210) (p=.25)	.04 (210) (p=.27)	.04 (124) (p=n.s.)	-.14 (124) (p=n.s.)	.12 (71) (p=n.s.)	.18 (71) (p=n.s.(.06)
Age	CA4 (Interval)	.09 (212) (p=.10)	-.03 (212) (p=.36)	-.32 (210) (p=.001)	-.28 (210) (p=.001)	.09 (212) (p=.10)	-.03 (212) (p=.34)	-.30 (210) (p=.001)	-.31 (210) (p=.001)	.01 (124)* (p=n.s.)	-.45 (124) (p=.001)	-.20 (71) (p=.05)	-.20 (71) (p=.01)
Race	White (1=yes)	-.03 (212) (p=.36)	.21 (212) (p=.001)	-.20 (210) (p=.002)	-.20 (210) (p=.002)	-.03 (212) (p=.33)	.21 (212) (p=.001)	-.20 (210) (p=.002)	-.21 (210) (p=.001)	.17 (124) (p=.001)	-.28 (124) (.001)	.11 (71) (p=n.s.)	-.03 (71)* (p=n.s.)
	Black (1=yes)	.03 (212) (p=.36)	-.19 (212) (p=.002)	.08 (210) (p=.14)	.12 (210) (p=.04)	.03 (212) (p=.36)	-.22 (212) (p=.001)	.08 (210) (p=.14)	.10 (210) (p=.08)	.06 (124) (p=n.s.)	-.16 (124) (p=.001)	-.24 (71) (p=n.s.)	.04 (71)* (p=n.s.)
	Indian (1=yes)	-.04 (212) (p=.30)	-.08 (212) (p=.14)	.16 (210) (p=.012)	.14 (210) (p=.05)	-.04 (212) (p=.30)	-.06 (212) (p=.20)	.16 (210) (p=.01)	.14 (210) (p=.02)	-.01 (124) (p=n.s.)* 0**	-.27 (124) (p=.001) 0**	-.10 (71) (p=n.s.) 0**	.05 (71)* (p=n.s.))**
	Other (1=yes)	.10 (212) (p=.08)	-.03 (212) (p=.34)	.05 (210) (p=.24)	.04 (210) (p=.26)	.10 (212) (p=.08)	.00 (212) (p=.49)	.05 (210) (p=.24)	.05 (210) (p=.21)				
Home Community Size	CA10 (ordinal)	.02 (212) (p=.39)	.04 (212) (p=.28)	.19 (210) (p=.003)	.23 (210) (p=.001)	.04 (212) (p=.30)	-.07 (212) (p=.17)	.17 (210) (p=.006)	.19 (210) (p=.003)	.09 (124) (p=n.s.)	-.06 (124) (p=n.s.)	.24 (71) (p=.01)	.00 (71) (p=n.s.)
	RCA10 (Dummy)	.01 (212) (p=.44)	-.01 (212) (p=.44)	.20 (210) (p=.002)	.24 (210) (p=.001)	.01 (212) (p=.44)	-.04 (212) (p=.30)	.20 (210) (p=.002)	.22 (210) (p=.001)				
	Metro (Dummy)	-.07 (212) (p=.16)	-.12 (212) (p=.04)	.18 (210) (p=.005)	.23 (210) (p=.001)	-.07 (212) (p=.16)	-.17 (212) (p=.008)	.18 (210) (p=.005)	.20 (210) (p=.002)				
Reading Aptitude	CA27 (ordinal)	.12 (187) (p=.05)	.08 (187) (p=.14)	.02 (187) (p=.41)	.00 (187) (p=.48)	.12 (187) (p=.05)	.08 (187) (p=.14)	-.03 (187) (p=.36)	-.03 (187) (p=.36)				
	RCA27 (Dummy)	.09 (200) (p=.14)	.04 (200) (p=.27)	.00 (198) (p=.47)	.00 (198) (p=.50)	.08 (200) (p=.14)	.05 (200) (p=.22)	.00 (198) (p=.47)	.00 (198) (p=.46)	.11 (124) (p=n.s.)	-.14 (124) (p=.01)	-.04 (71) (p=n.s.)	.07 (71)* (p=n.s.)
Math Aptitude	CA28 (ordinal)	.10 (189) (p=.08)	.06 (189) (p=.20)	.13 (189) (p=.04)	.12 (189) (p=.05)	.10 (189) (p=.09)	.07 (189) (p=.17)	.09 (189) (p=.10)	.09 (189) (p=.10)				
	RCA28 (Dummy)	.07 (200) (p=.17)	-.01 (200) (p=.46)	.12 (198) (p=.05)	.12 (198) (p=.05)	.07 (200) (p=.17)	.04 (200) (p=.31)	.12 (198) (p=.05)	.12 (198) (p=.04)	.00 (124)* (p=n.s.)	.19 (124) (p=.001)	.04 (71)* (p=n.s.)	.12 (71) (p=n.s.)
Age at First Court Contact	AGNAGE (Interval)	.00 (211) (p=.50)	.07 (211) (p=.15)	-.13 (209) (p=.03)	-.11 (209) (p=.06)	.03 (211) (p=.36)	.07 (211) (p=.15)	-.16 (209) (p=.01)	-.15 (209) (p=.01)	.00 (124)* (p=n.s.)	-.02 (124) (p=n.s.)	.15 (71) (p=n.s.)	.08 (71)* (p=n.s.)
Number of Previous Court Contacts	PREVCC (Interval)	.11 (209) (p=.06)	.00 (209) (p=.49)	-.05 (207) (p=.25)	-.04 (207) (p=.27)	.09 (209) (p=.11)	.01 (209) (p=.45)	-.06 (207) (p=.20)	-.08 (207) (p=.14)	.13 (124) (p=.05)	-.22 (124) (p=.001)	-.03 (71)* (p=n.s.)	-.04 (71)* (p=n.s.)
Number of Prior Commitments	PC (Interval)	.01 (212) (p=.43)	.05 (212) (p=.24)	.12 (210) (p=.04)	.16 (210) (p=.01)	-.03 (212) (p=.33)	-.01 (212) (p=.46)	.15 (210) (p=.015)	.16 (210) (p=.009)	.07 (124) (p=n.s.)	.12 (124) (p=.05)	.21 (71) (p=.05)	.10 (71)* (p=n.s.)
Family Home Environment	FHE (ordinal)	.08 (211) (p=.12)	.08 (211) (p=.12)	-.04 (209) (p=.31)	-.04 (209) (p=.27)	.08 (211) (p=.13)	.07 (211) (p=.16)	-.03 (209) (p=.36)	-.03 (209) (p=.31)	.04 (124) (p=n.s.)	-.01 (124) (p=n.s.)	.07 (71) (p=n.s.)	-.19 (71) (p=.05)
	RFHE (Dummy)	.09 (212) (p=.10)	.03 (212) (p=.33)	.00 (210) (p=.49)	-.02 (210) (p=.37)	.09 (212) (p=.10)	.04 (212) (p=.27)	.00 (210) (p=.49)	-.02 (210) (p=.41)				
Severity of Drug Use	Drugs 3 (Interval)	.00 (212) (p=.48)	.11 (212) (p=.05)	.07 (210) (p=.15)	.06 (210) (p=.19)	.02 (212) (p=.40)	.11 (212) (p=.05)	.08 (210) (p=.14)	.06 (210) (p=.18)	.11 (124) (p=n.s.)	.08 (124) (p=n.s.)	.00 (71)* (p=n.s.)	.05 (71)* (p=n.s.)
"Poormess" of Demeanor at Diagnostic	Demean (ordinal) RDemean (Dummy)	.13 (212) (p=.03) .07 (212) (p=.15)	.14 (212) (p=.03) .06 (212) (p=.19)	.08 (210) (p=.11) .08 (210) (P=.13)	.16 (210) (p=.01) .14 (210) (p=.02)	.13 (212) (p=.03) .07 (212) (p=.15)	.15 (212) (p=.02) .08 (212) (p=.11)	.06 (210) (p=.18) .08 (210) (p=.13)	.10 (210) (p=.08) .10 (210) (p=.07)	.20 (124) (p=.001)	.13 (124) (p=.05)	.19 (71) (p=n.s.)	.00 (71)* (p=n.s.)
Most Serious Offense	OFF2 (Interval)	.10 (212) (p=.07)	-.01 (212) (p=.47)	.12 (210) (p=.05)	.10 (210) (p=.09)	.10 (212) (p=.08)	.03 (212) (p=.34)	.05 (210) (p=.25)	.04 (210) (p=.26)	.06 (124) (p=n.s.)	.32 (124) (p=.001)	.17 (71) (p=n.s.)	-.06 (71)* (p=n.s.)

REFERENCES

Asher, Herbert B. Causal Modeling. Sage Publications, Beverly Hills, 1976.

Blalock, Hubert M., Jr. Social Statistics. McGraw-Hill, New York, 1972.

Chein, David B. Decision Making in Juvenile Correctional Institutions. Minnesota Department of Corrections, St. Paul, 1976.

Cohen, Lawrence E. Delinquency Dispositions: An Empirical Analysis of Processing Decisions in Three Juvenile Courts. Law Enforcement Assistance Administration, Washington, D.C., 1975.

Hirschi, Travis. Causes of Delinquency. University of California Press, 1969.

Minnesota Department of Corrections. Past Effort 1970-1977, Future Directions 1978-1981 - Report to the 1977 Minnesota Legislature, St. Paul, 1977.

Minnesota Department of Corrections. Short-Term Research Project - Follow-Up Report. St. Paul, 1977.

Nie, N.H., Hull, C.H., Jenkins, J.G., Steinbrenner, K., Bent, D.H. Statistical Package for the Social Sciences, Second Edition. McGraw-Hill, New York, 1975.

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