Iowa Board of Parole Risk Assessment Validation

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Board of Parole Risk Assessment Validation

As part of its effort to provide technical assistance to the Iowa Board of Parole, the Division of Criminal and Juvenile Justice Planning (CJJP) embarked on an effort to validate the risk assessment instrument used by the Board since the early 1980's. This instrument, originally designed by Dr. Daryl Fischer during his employment in CJJP's predecessor agency and later modified after his departure to Arizona, is designed to provide a statistical measurement of an offender's likelihood of recidivism. Unlike some other risk assessment tools, it was designed to predict violent recidivism as well as general recidivism; the highest risks, in other words, are high risk both for general **and** violent recidivism.

The rationale for re-validating the risk assessment instrument stemmed from its not having been validated since 1990, its critical role in the Board's decision-making process, and a statutory requirement that the highest statistical risks receive approval from all five Board members prior to release on parole.

In completing the research, the researchers have concluded that the Board of Parole should continue using the risk assessment instrument in concert with other information available to the Board at the time of release consideration. Upon validation, the instrument showed sufficient accuracy to be of benefit to the Board in its deliberations.

Recidivism Methodology

The database against which the risk assessment instrument was validated was the group of offenders released from Iowa's prison system in state FY1996. CJJP had begun post-release tracking of this group in 1999, using multiple definitions of recidivism. The study tracked *releases* rather than *offenders*, including only those releases capable of being a *final* release from the prison system. Releases to OWI facilities and work release, therefore, were not included in the cohort because each of these should eventually lead either to parole or expiration. In an effort to reduce duplication in the cohort, re-releases from state violator programs were also not included, as all of these releases would have been preceded by an earlier parole.

In tracking the FY96 release cohort, CJJP collected data from in-state (Computerized Criminal History, CCH) and out-of-state (Interstate Identification Index, III) criminal history files, the state community-based corrections database (ICBC) and the state prison database (ACDS). If data from these sources were inconclusive, the state court information system (ICIS) was also consulted, although this occurred in very few cases.

The in-state and out-of-state record systems have different strengths and weaknesses. Iowa's in-state criminal history system is very good in identifying new arrests that lead to conviction and new imprisonments, but by law it does not include arrests that resulted in dismissal or acquittal. The record systems accessed through III typically are more inclusive than Iowa's system in identifying records **not** leading to conviction, but they frequently lack dispositions or incarcerations.

The release cohort studied included 2,679 releases. In 257 cases (mostly OWI's) no assessment had been done and insufficient data existed to create a new assessment. This yielded a total cohort of 2,322. In some of the analyses, a few cases "dropped out" because data were not available on the particular criterion measure used in that analysis.

There were 11 individuals who were in the database more than once due to multiple releases during the period. This occurred when individuals were initially paroled, then revoked, and then either re-paroled or released by discharge, with all of these occurring during FY96.

In tracking releases, the concept of "time at risk" was used. Generally, in determining time at risk the date of the release from prison was subtracted from the date of the most recent record check. This resulted in time at risk ranging from 1,615 to 2,572 days, a broad range resulting from not including all offenders in the final update in June and July of 2002[1].

Among the offenders having shortened time at risk were three offenders who died with no recidivism prior to the end of the tracking period. Fifteen offenders went directly from Iowa prisons to other incarceration without being released during the tracking period. They were not included in the recidivism analysis except when using **return to prison** as the recidivism criterion.

Any time spent incarcerated during the follow-up period was not counted in assessing an offender's time at risk. This would come into play, for example, when examining re-arrest when an offender might be returned to prison on a technical violation of parole. Because the revocation would not be counted as a new arrest,[2] the time spent in prison on the revocation would not be regarded as time at risk in determining the time to a later arrest. While this incident would count as a return to prison, the time spent incarcerated would be subtracted from the time elapsing until an arrest for a new crime, as the return to prison itself would not be counted as a new arrest.

While it would be useful to also have access to the amount of time offenders spend in jail (awaiting parole revocation or other returns to prison), this information was not available in this research because Iowa does not maintain a central repository for such jail data. It is likely, then, that on average the data on length of time until re-imprisonment is somewhat of an over-estimation, as some of the period between release in FY96 and re-imprisonment would probably have been spent in jail awaiting transfer to the prison system. It is also possible that some offenders paroled to detainer also went to jail without any new arrest or conviction; their time at risk

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[1] Collection of the final batch of rapsheets occurred during two periods. Those added to the original cohort in 2002 were tracked until mid-2002. The original cohort was tracked until December of 2000. Because the "time at risk" concept was used in the research, the differing length of the tracking period should not present any statistical problems. As noted above, all offenders included in the final cohort were tracked at least four years.

[2] Revocations were only counted as new arrests if they involved an offense in addition to the parole or probation revocation.

would also be over-estimated, affecting not only the length of time until a return to prison, but also the time to first new arrest or conviction.

Characteristics of the cohort

Table 1 through Table 5 present demographic information on the characteristics of the FY96 release cohort used to validate the risk assessment instrument. The group appears to be representative of Iowa prison releases during the 1990's, although there was a gradual but large increase in the percentage of released offenders serving sentences on drug crimes through the period. As shown in Table 1, the group was overwhelmingly male, and most had been released on parole. Women were more likely to have been released on parole than men.

Table 1. Sex and Release Type of FY1996 Release Cohort

Release Type	Sex		Total
	Female	Male	
Expiration	17	424	441
Parole	257	1,981	2,238
Total	**274**	**2,405**	**2,679**

Table 2 shows that the cohort was about 80 percent white, with the majority of the remainder being African-American. African American women, in particular, were over-represented in the cohort, as they constituted about 25 percent of the female cohort. African-Americans generally were over-represented based upon the composition of the Iowa population (2.5 percent African-American in 2000).

Table 2. Sex and Race of FY96 Release Cohort

Race	Sex		Total
	Female	Male	
Caucasian	192	1,818	2,010
African American	71	464	535
Hispanic	2	81	83
Native American	9	31	40
Asian/Pacific Islander	0	7	7
Other	0	4	4
Total	**274**	**2,405**	**2,679**

Table 3 presents the age and sex of the FY96 release cohort. Women in the cohort (median age 32) tended to be slightly older than the men (median age 31).

Table 3. Sex and Age of FY96 Release Cohort

Age Group	Sex		Total
	Female	Male	
Unknown	0	4	4
<21	14	77	91
21-24	21	447	468
25-29	65	524	589
30-34	75	498	573
35-39	54	418	472
40-44	28	205	233
45-49	9	113	122
50+	8	119	127
Total	**274**	**2,405**	**2,679**

Table 4 shows that most released offenders in the cohort had served sentences for felonies rather than misdemeanors, with most of the felonies being Class D felonies (5-year maximum) not against persons. While the FY96 release cohort is similar to those released in 1990-1995 in its small numbers of B felonies (25-year maximum) not against persons, later cohorts include more of these offenders due to the creation of Class B drug offenses in the early 1990's.

Table 4. Sex and Offense Class of FY96 Release Cohort

Offense Class	Sex		Total
	Female	Male	
B Felony not vs. persons	1	4	5
B Felony vs. persons	0	39	39
B Felony sex offense	1	18	19
C Felony not vs. persons	47	524	571
C Felony vs. persons	6	76	82
C Felony sex offense	1	76	77
Compact prisoner	0	1	1
D Felony not vs. persons	120	1,068	1,188
D Felony vs. persons	7	70	77
D Felony sex offense	1	53	54
Other Felony not vs. persons	2	29	31
Other Felony vs. persons	0	9	9
Agg Misdemeanor not vs. persons	76	300	376
Agg Misdemeanor vs. persons	10	80	90
Agg Misdemeanor sex offense	0	29	29
Serious Misd. Not vs. persons	1	14	15
Serious Misd. vs. persons	1	12	13
Serious Misd. sex offense	0	3	3
Total	**274**	**2,405**	**2,679**

Table 5 shows that most Iowa prison releases in FY96 left prison after serving sentences for non-violent offenses. Less than 20% were released with a "lead" (i.e.,

most serious) charge either involving a crime against persons or a sex offense. This has been characteristic of Iowa prison releases in recent years, although in the late 1990's there was a significant increase in releases of drug offenders.

Table 5. Sex and Offense Type of FY96 Release Cohort

Offense Type	Sex		Total
	Female	Male	
Compact	0	1	1
Drug	89	901	990
Not vs. persons	156	968	1,124
Vs. persons	24	286	310
Sex offense	3	179	182
Weapons	2	70	72
Total	**274**	**2,405**	**2,679**

Finally, Table 6 presents the distribution of the FY96 release cohort by risk assessment score:

Table 6. Risk level of Offense Type

Risk Score	Offense Type		Total
	Non-person	Vs. Person	
2	506	157	663
3	38	70	108
4	164	2	166
5	366	1	367
6	265	91	356
7	116	0	116
8	188	52	240
9	198	106	304
Total	1841	479	2,320

Validation Methodology

As a first step in validating the parole risk assessment, CJJP met with the Board of Parole in January of 2002 to discuss how the parole risk assessment was being used and how the statistical calculations were done. Risk assessment scores for the FY96 cohort were initially taken from the ACDS data system. Because initial examination of the data showed that a number of assessment scores were missing, CJJP first collected assessment data from archival paper files and then collected missing data from computer files in the BOP office. It was also found that, because the ACDS system "over-wrote" scores whenever prior releases were returned to prison, the scores of many inmates had to be re-calculated to ignore the effect of any later

offenses.[3] It was also learned that the Board had modified the risk assessment instrument in 1999 so that the scores found in ACDS were based on two different scoring systems.

After these discoveries, CJJP worked with the parole board to ensure consistent and accurate assessments, including calculating risk assessments by hand. In this process considerable time was spent in reviewing relevant policies and procedures and informally interviewing BOP staff and other key players (e.g., Daryl Fischer) pertaining to the development, design, and implementation of the risk assessment instrument. In this process, all scores were re-calculated. By October 2002, researchers were confident that scores for all offenders were accurate for the time of the FY96 release (but using the 1999 modification). These scores were then used in the validation.

CJJP undertook a number of activities in examining the validity of the risk assessment instrument, including the creation of a validation database, cleaning and coding the data, and running a number of statistical tests, including Mean Cost Rating (MCR), Pearson's R, ROC, and logistic regression. Each of these tests is described below:

- **MCR** may be interpreted as the proportional improvement over chance in the predictive efficiency of the device in question. In the case of chance or null-prediction, this improvement is zero, hence MCR equals 0.00, while in the case of perfect prediction, this improvement is 1.00, hence the value of 1.00 for MCR. MCR was determined to be an appropriate test to assess the validity of the BOP risk assessment instrument, given the use of dichotomous criteria (e.g., arrested or not arrested, convicted or not convicted). MCR allowed the CJJP to measure predictive accuracy in terms of the proportion of cases correctly classified (high risk cases that fail and low risk cases that succeed).
- **Pearson's R** is a statistic usually symbolized as r showing the degree of linear relationship between two variables that have been measured on interval or ratio scales. While there was initial concern that this measure might be inappropriate because it requires two continuous variables (both the independent and dependent variables), we were advised that Pearson's R was appropriate for this study given the relatively large population size.[4]

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[3] That is, whenever an offender was returned to prison and a new assessment was completed, the score from any previous assessment was automatically deleted from the data system. Because the new score was likely to be higher than the previous score (due to the return to prison and/or any new arrests and convictions), recalculations had to be performed without using information from the return or new arrests or convictions.

[4] In the course of attempting to interpret results from the study, CJJP staff met with statisticians from the University of Iowa and Iowa State University to determine the appropriateness of the statistical tests and research conclusions. Dr. Mack Shelley, from Iowa State University, used the word "robust" in describing the study's population, noting that the study was actually examining a "census population" rather than a "sample." Dr. Shelley indicated that using Pearson's R has become common practice with larger data sets, although its value is sometimes difficult to interpret. Shelley indicated that if the value of Pearson's R were squared then it could be interpreted as the coefficient of the portion of the variance explained by the scoring system (e.g., .07 could be interpreted as seven percent of the explained variance between risk score and new arrest).

- The Receiver Operating Characteristic **(ROC)** was also used as one measure of the risk assessment instrument's accuracy in predicting recidivism. ROC analysis is part of a field called "Signal Detection Theory" developed during World War II for the analysis of radar images. Signal detection theory measures the ability of radar receiver operators to distinguish among enemy targets, friendly ships, or just noise. One advantage of ROC is that its interpretation may be easier for a layperson to understand than the interpretation of Pearson's R. ROC lies on a scale of 0 to 1, with .50 being considered the point at which statistical significance is obtained.
- **Logistic Regression** was also used to provide a matrix showing the overall relationship between observed and predicted cases. This yields an overall prediction percentage between the independent and dependent variables. Using regression was suggested to the CJJP staff by one of its statistical consultants because of the ease with which non-statisticians can grasp its results.

This research was designed to validate the predictive accuracy of the risk assessment instrument itself rather than to study its use or the process used by the Board of Parole in applying it. CJJP did not, for example, attempt to determine if inmates assessed as lower risk tended to be released earlier than those with higher scores. Similarly, there was no attempt to determine **how** the Board used the risk assessment in concert with other assessments or institutional factors. The basic question addressed here was whether the risk assessment instrument predicted recidivism.

Results

In assessing the predictive power of the BOP risk assessment instrument a variety of criterion measures were used:

- New arrests
- New arrests within one year of release
- Felony arrests
- Felony arrests within the first year
- Arrests for crimes against persons
- Arrests for crimes against persons within the first year
- New convictions
- New convictions against persons
- Return to Iowa prison

The parole board risk scores for the FY96 cohort ranged from 2-9. Prediction occurred in the desired direction (i.e., lower scores tended to have lower rates of recidivism, and higher scores tended to have higher rates). There was some suspicion among the study's statistical consultants that the (moderately) positive results may stem in part from the large number of offenders included in the study.

The **MCR** scores for the Iowa Board of Parole risk assessment ranged between .159 and .271 for the various definitions of recidivism. These results were slightly better when only those imprisoned for crimes against persons were included.

The **Pearson's R** statistic ranged between .111 and .217; squaring them resulted in scores from.012 to .047 for all offenders. These results again improved slightly when only those committed for crimes against persons were included.

The **ROC** statistics ranged from .580 to .636 for all offenders and increased slightly for the "person offenders" only, indicating moderately significant prediction.

Logistic Regression yielded results consistent with those achieved through use of the other statistical tests. The overall percent correct or prediction accuracy was 64.4 percent (between observations and predictions). The odds ratio of 2.347 implies that offenders with scores between seven and nine were more than twice as likely to recidivate as those with lower scores.

Because cohort members with a score of four showed higher-than-expected rates of recidivism, some effort was expended analyzing the recidivism rates at each score and then trying to identify a cut point (a score that divided the scores into high and low levels of risk). While doing this continued to show a correlation between risk score and recidivism**,** only when those scoring four were omitted from calculations was a marginally significant MCR score (.200) obtained.

Conclusions

It is the conclusion of the researchers and study consultants that the Board of Parole should continue using the risk assessment instrument in conjunction with other data available to the Board in its decision-making process. Upon validation, the instrument showed sufficient accuracy to assist the Board in protecting society from further victimization.

While most of the statistics obtained in this study are considered statistically significant (see the Appendix), the associations between risk assessment scores and the various measures of recidivism were, nonetheless, relatively weak. As was suggested by Stephan Arndt, one of the study's statistical consultants, the statistical significance levels found may be a product of the large sample size. However, after careful review of the study's results, the authors and consultants believe that continued use of the risk assessment instrument is warranted, at least until further evaluation of the instrument is undertaken.

Results suggest several courses of action by the Board of Parole:

- In using the risk assessment instrument, the Board should pay special attention to those with scores of four. Those in this group showed significantly higher recidivism than those scoring two and three, and also higher recidivism than those scoring five and six. While extensive analyses were completed to identify the source of this discrepancy, these efforts found no apparent reasons for high recidivism among this group.
- The non-empirical modifications made to the risk assessment instrument in 1999 may have reduced its predictive accuracy. No similar modifications to the instrument should be contemplated without sufficient empirical support.

- Given sufficient resources, the Board should consider further validation. Such research should use a different cohort and consider a comparison of the current tool with that adopted in 1990. Doing so would have a number of benefits and might shed light on the higher recidivism rate of those scoring four found in the current research.

Appendix

Parole Risk Assessment Validation
Description of Risk Scale
List of dependent variables used

Population: Offenders released from prison during FY1996

Sample Size: 2,322

Independent Variable: Risk Score

Risk Score Scale:	2	Good Safety Risk, Very Good Violent Risk
	3	Good Safety Risk, Good Violent Risk
	4	Fair Safety Risk, Good Violent Risk
	5	Poor Safety Risk, Good Violent Risk
	6	Poor Safety Risk, Fair Violent Risk
	7	Very Poor Safety Risk, Good Violent Risk
	8	Very Poor Safety Risk, Poor Violent Risk
	9	Very Poor Safety Risk, Very Poor Violent Risk

Dependent Variable:
- New Arrest
- Violent Arrest
- Arrest during 1st year
- Felony Arrest during 1st year
- Return to Iowa Prison
- New Conviction
- New Violent Conviction

Statistics Run:
- Crosstabs
- MCR (Sommer's d)
- Pearson's R
- ROC
- Linear Regression

Iowa Parole Risk Assessment Validation
Summary of cases falling within risk levels
Summary: arrests within one year, by risk level

Dependent Variable: Arrest within one year

Results

Risk Level	Total Cases	Arrest within one year	
9 (VP-VP)	(304)	156	51.3%
8 (VP-P)	(241)	114	47.3%
7 (VP-G)	(116)	55	47.4%
6 (P-F)	(356)	128	36.0%
5 (P-G)	(367)	143	39.0%
4 (F-G)	(166)	67	40.4%
3 (G-G)	(108)	18	16.7%
2 (G-VG)	(664)	148	22.3%
All Cases	(2,322)	829	35.7%

Statistics

MCR	.253
Pearson's R	.217
ROC	.626

MCR Scores, by Offender types, by various recidivism definitions

Offenders	MCR SCORES (Risk 2-9)												
	New Arrest	New Felony	IA Arrest	Violent Arr	ViolFelArr	Arrest-1yr	Arrest-2yr	Arrest-3yr	Arrest-4yr	FelArr-1yr	FelArr-2yr	FelArr-3yr	FelArr-4yr
All	0.210	0.208	0.198	0.159	0.188	0.253	0.226	0.225	0.216	0.271	0.216	0.221	0.222
Expired	0.332	0.329	0.314	0.156	0.281	0.279	0.283	0.315	0.314	0.326	0.292	0.300	0.297
Paroled	0.176	0.177	0.162	0.148	0.141	0.213	0.193	0.190	0.186	0.227	0.182	0.191	0.200
Rel-OWI	0.275	0.269	0.279	0.287	0.427	0.189	0.225	0.224	0.201	0.188	0.173	0.141	0.247
Rel-WR	0.223	0.204	0.202	0.137	0.132	0.226	0.195	0.257	0.234	0.249	0.201	0.233	0.225
Rel-Prison	0.205	0.211	0.198	0.156	0.206	0.270	0.242	0.217	0.212	0.289	0.225	0.224	0.221
Person	0.258	0.290	0.252	0.292	0.260	0.309	0.304	0.313	0.251	0.341	0.316	0.337	0.312
Non-person	0.191	0.190	0.179	0.107	0.145	0.250	0.207	0.198	0.202	0.263	0.195	0.197	0.201
Drug	0.234	0.177	0.193	0.163	0.210	0.237	0.234	0.259	0.255	0.180	0.130	0.154	0.127
Pub Ord	0.333	0.089	0.219	0.220	-0.031	0.194	0.114	0.083	0.398	0.258	0.179	0.162	0.094
OWI	0.213	0.248	0.190	0.240	0.436	0.282	0.302	0.255	0.214	0.359	0.282	0.245	0.276
Property	0.173	0.189	0.177	0.063	0.084	0.255	0.182	0.164	0.185	0.255	0.186	0.189	0.209
Person	0.148	0.162	0.144	0.166	0.127	0.224	0.208	0.235	0.160	0.266	0.225	0.255	0.220
Sex	0.286	0.436	0.320	0.474	0.505	0.382	0.373	0.340	0.258	0.392	0.408	0.398	0.389
Traffic	0.280	0.320	0.280	-0.301	0.000	0.401	0.254	0.265	0.280	0.438	0.438	0.438	0.320
Weapons	0.005	-0.027	0.107	-0.071	0.066	0.129	0.051	0.066	-0.043	0.171	0.065	0.093	0.039
Felons	0.214	0.196	0.186	0.164	0.198	0.265	0.228	0.221	0.211	0.258	0.198	0.202	0.207
Misd'ants	0.204	0.243	0.264	0.145	0.146	0.232	0.231	0.260	0.254	0.331	0.282	0.293	0.273

Significant Level .01
Significant Level .05
Not Significant

MCR Scores, by Offender types, by various recidivism definitions

Offenders	MCR SCORES (Risk 2-9)									
	RetIAPris	RetPrison	Pris-1yr	Pris-2yr	Pris-3yr	Pris-4yr	New Conv.	Felony Conv.	IAFelArr	IAFelConv
All	0.203	0.206	0.092	0.173	0.175	0.199	0.209	0.209	0.222	0.209
Expired	0.276	0.250	0.167	0.263	0.287	0.274	0.325	0.241	0.346	0.241
Paroled	0.209	0.217	0.130	0.182	0.172	0.205	0.172	0.199	0.188	0.199
Rel-OWI	0.352	0.352	0.191	0.366	0.270	0.263	0.230	0.189	0.300	0.189
Rel-WR	0.232	0.239	0.067	0.171	0.184	0.231	0.219	0.191	0.218	0.191
Rel-Prison	0.187	0.188	0.090	0.157	0.166	0.185	0.208	0.220	0.225	0.220
Person	0.308	0.293	0.178	0.245	0.283	0.285	0.256	0.315	0.343	0.315
Non-person	0.178	0.185	0.079	0.161	0.149	0.178	0.192	0.187	0.195	0.187
Drug	0.163	0.158	0.076	0.133	0.118	0.152	0.194	0.127	0.171	0.127
Pub Ord	-0.002	-0.031	0.022	0.136	0.006	-0.050	0.137	0.094	0.107	0.094
OWI	0.231	0.255	0.193	0.275	0.200	0.223	0.200	0.222	0.228	0.222
Property	0.193	0.204	0.060	0.151	0.168	0.203	0.192	0.200	0.200	0.200
Person	0.235	0.220	0.079	0.172	0.200	0.215	0.165	0.246	0.207	0.246
Sex	0.349	0.322	0.307	0.278	0.316	0.292	0.281	0.313	0.552	0.313
Traffic	0.351	0.351	0.280	0.394	0.142	0.220	0.280	0.438	0.320	0.438
Weapons	0.065	-0.002	-0.127	0.088	0.112	0.065	0.174	0.058	-0.014	0.058
Felons	0.184	0.190	0.064	0.150	0.152	0.184	0.208	0.192	0.203	0.192
Misd'ants	0.274	0.256	0.222	0.263	0.260	0.246	0.226	0.271	0.290	0.271

Significant Level .01
Significant Level .05
Not Significant

Pearson's R Scores, by Offender types, by various recidivism definitions

Offenders	Pearson's R												
	New Arrest	New Felony	IA Arrest	Violent Arr	ViolFelArr	Arrest-1yr	Arrest-2yr	Arrest-3yr	Arrest-4yr	FelArr-1yr	FelArr-2yr	FelArr-3yr	FelArr-4yr
All	0.172	0.187	0.172	0.118	0.091	0.217	0.202	0.195	0.180	0.193	0.175	0.186	0.191
Expired	0.281	0.293	0.292	0.115	0.133	0.278	0.274	0.291	0.275	0.265	0.255	0.270	0.267
Paroled	0.147	0.163	0.142	0.112	0.070	0.182	0.172	0.166	0.158	0.161	0.148	0.162	0.174
Rel-OWI	0.180	0.236	0.191	0.236	0.162	0.173	0.207	0.188	0.159	0.150	0.155	0.129	0.226
Rel-WR	0.184	0.180	0.176	0.099	0.052	0.191	0.175	0.225	0.198	0.170	0.163	0.196	0.192
Rel-Prison	0.170	0.190	0.173	0.118	0.107	0.235	0.216	0.189	0.178	0.208	0.182	0.188	0.189
Person	0.238	0.248	0.234	0.238	0.148	0.236	0.273	0.287	0.234	0.205	0.232	0.261	0.253
Non-person	0.153	0.174	0.156	0.079	0.069	0.219	0.185	0.170	0.166	0.194	0.163	0.170	0.177
Drug	0.195	0.165	0.173	0.132	0.101	0.202	0.212	0.228	0.214	0.123	0.101	0.124	0.105
Pub Ord	0.202	0.085	0.179	0.188	-0.047	0.158	0.080	0.040	0.253	0.219	0.164	0.153	0.102
OWI	0.166	0.229	0.153	0.179	0.173	0.253	0.272	0.219	0.180	0.283	0.242	0.217	0.251
Property	0.139	0.172	0.153	0.044	0.042	0.222	0.162	0.140	0.152	0.189	0.159	0.165	0.184
Person	0.137	0.145	0.132	0.148	0.078	0.172	0.200	0.221	0.151	0.165	0.172	0.204	0.189
Sex	0.267	0.331	0.304	0.355	0.251	0.289	0.318	0.295	0.239	0.214	0.275	0.262	0.250
Traffic	0.262	0.292	0.262	-0.189	0.000	0.387	0.255	0.281	0.262	0.383	0.383	0.383	0.292
Weapons	0.029	-0.024	0.105	-0.071	0.013	0.117	0.060	0.069	-0.010	0.120	0.064	0.087	0.038
Felons	0.177	0.177	0.164	0.120	0.096	0.225	0.203	0.193	0.178	0.183	0.162	0.171	0.180
Misd'ants	0.169	0.227	0.229	0.121	0.076	0.210	0.214	0.229	0.210	0.241	0.231	0.248	0.237

Significant Level .01
Significant Level .05
Not Significant

Pearson's R Scores, by Offender types, by various recidivism definitions

	Pearson's R											
Offenders	RetIAPris	RetPrison	Pris-1yr	Pris-2yr	Pris-3yr	Pris-4yr	Rev-New	Rev-Tech	New Conv.	Felony Conv.	IAFelArr	IAFelConv
All	0.181	0.185	0.064	0.145	0.153	0.177	0.066	-0.032	0.177	0.179	0.191	0.179
Expired	0.255	0.233	0.085	0.216	0.251	0.249			0.280	0.217	0.306	0.217
Paroled	0.188	0.195	0.094	0.155	0.150	0.182			0.149	0.172	0.165	0.172
Rel-OWI	0.283	0.283	0.157	0.323	0.232	0.216	0.236	0.070	0.164	0.175	0.266	0.175
Rel-WR	0.209	0.216	0.046	0.148	0.166	0.209	0.136	-0.050	0.185	0.164	0.183	0.164
Rel-Prison	0.164	0.167	0.061	0.130	0.143	0.162	-0.005	-0.039	0.178	0.185	0.192	0.185
Person	0.264	0.258	0.103	0.190	0.237	0.245	0.056	0.005	0.239	0.246	0.274	0.246
Non-person	0.162	0.167	0.059	0.139	0.134	0.161	0.072	-0.040	0.160	0.164	0.172	0.164
Drug	0.144	0.142	0.048	0.113	0.106	0.135			0.166	0.107	0.143	0.107
Pub Ord	-0.036	-0.069	-0.002	0.073	-0.029	-0.076			0.099	0.102	0.111	0.102
OWI	0.208	0.229	0.157	0.245	0.178	0.200			0.159	0.208	0.211	0.208
Property	0.175	0.186	0.045	0.131	0.151	0.184			0.161	0.174	0.175	0.174
Person	0.207	0.201	0.050	0.141	0.180	0.196			0.153	0.203	0.175	0.203
Sex	0.298	0.268	0.171	0.233	0.265	0.231			0.256	0.187	0.389	0.187
Traffic	0.302	0.302	0.232	0.343	0.154	0.218			0.262	0.383	0.292	0.383
Weapons	0.060	0.010	-0.108	0.050	0.083	0.060			0.156	0.068	-0.011	0.068
Felons	0.165	0.171	0.047	0.128	0.134	0.164			0.178	0.166	0.176	0.166
Misd'ants	0.235	0.226	0.128	0.201	0.217	0.212			0.194	0.227	0.253	0.227

Significant Level .01
Significant Level .05
Not Significant

Risk by Total Recidivism

			TOTRECID		
			No	**Yes**	**Total**
Risk Score	2	Count	262	402	664
		% within CORRISK	39.5%	60.5%	100.0%
		% within TOTRECID	39.0%	24.4%	28.6%
		% of Total	11.3%	17.3%	28.6%
	3	Count	53	55	108
		% within CORRISK	49.1%	50.9%	100.0%
		% within TOTRECID	7.9%	3.3%	4.7%
		% of Total	2.3%	2.4%	4.7%
	4	Count	31	135	166
		% within CORRISK	18.7%	81.3%	100.0%
		% within TOTRECID	4.6%	8.2%	7.1%
		% of Total	1.3%	5.8%	7.1%
	5	Count	97	270	367
		% within CORRISK	26.4%	73.6%	100.0%
		% within TOTRECID	14.4%	16.4%	15.8%
		% of Total	4.2%	11.6%	15.8%
	6	Count	100	256	356
		% within CORRISK	28.1%	71.9%	100.0%
		% within TOTRECID	14.9%	15.5%	15.3%
		% of Total	4.3%	11.0%	15.3%
	7	Count	28	88	116
		% within CORRISK	24.1%	75.9%	100.0%
		% within TOTRECID	4.2%	5.3%	5.0%
		% of Total	1.2%	3.8%	5.0%
	8	Count	46	195	241
		% within CORRISK	19.1%	80.9%	100.0%
		% within TOTRECID	6.8%	11.8%	10.4%
		% of Total	2.0%	8.4%	10.4%
	9	Count	55	249	304
		% within CORRISK	18.1%	81.9%	100.0%
		% within TOTRECID	8.2%	15.1%	13.1%
		% of Total	2.4%	10.7%	13.1%
Total		Count	672	1650	2322
		% within CORRISK	28.9%	71.1%	100.0%
		% within TOTRECID	100.0%	100.0%	100.0%
		% of Total	28.9%	71.1%	100.0%

Measures of Predictive Power by Various Recidivism Measures

	New Arrest	Violent Arrest	Arrest within 1yr	FelArr-1yr	Return to IA Prison	New Conv.	Violent Conv.
All Offenders							
MCR	0.210	0.159	0.253	0.271	0.203	0.209	0.168
Pearson's R	0.172	0.118	0.217	0.193	0.181	0.177	0.111
ROC	0.605	0.580	0.626	0.636	0.602	0.605	0.584
Person Offenders							
MCR	0.258	0.292	0.309	0.341	0.308	0.256	0.295
Pearson's R	0.238	0.238	0.236	0.205	0.264	0.239	0.226
ROC	0.629	0.646	0.654	0.671	0.654	0.628	0.608
Non-Person Offenders							
MCR	0.191	0.107	0.250	0.263	0.178	0.192	0.108
Pearson's R	0.153	0.079	0.219	0.194	0.162	0.160	0.070
ROC	0.596	0.554	0.625	0.631	0.589	0.596	0.576

Measures of Predictive Power for Return to Prison Criterion

	IAPris-1yr	IAPris-2yr	IAPris-3yrs	IAPris-4yrs	IAPris-5yrs	IAPris-6yrs
All Offenders						
MCR	0.091	0.178	0.173	0.196	0.203	0.201
Pearson's R	0.061	0.146	0.148	0.171	0.180	0.179
ROC	0.545	0.589	0.587	0.598	0.602	0.601
Person Offenders						
MCR	0.241	0.296	0.302	0.304	0.310	0.293
Pearson's R	0.127	0.211	0.237	0.251	0.263	0.254
ROC	0.653	0.619	0.615	0.625	0.623	0.627
Non-Person Offenders						
MCR	0.071	0.160	0.146	0.172	0.178	0.180
Pearson's R	0.051	0.135	0.129	0.154	0.161	0.162
ROC	0.522	0.583	0.582	0.594	0.599	0.596