



The University of
Montana

**JUVENILE OFFENDERS IN MONTANA:
RISK LEVEL, PROBATION STATUS AND RECIDIVISM
Fiscal Year 2009**

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EXECUTIVE SUMMARY

This report is the result of a contract between the Montana Supreme Court Office of the Court Administrator (OCA), Youth and District Court Services, and The University of Montana (UM) School of Social Work. UM provided the services of Dr. Tim Conley and student research assistants Kimberly Spurzem, Eamon Marsh, and Jessica Hazlett, to complete research and evaluation pertaining to certain OCA records. Primarily, Dr. Conley and his assistants utilized quantitative research and secondary data analysis methods to statistically examine the electronic records of 1728 juvenile offenders who had received at least one ticket between 7-1-08 and 6-30-09. All youth in the study were on either formal or informal probation to start and had been administered at least one "Back On Track" youth risk assessment (BOT) at any time before 6/30/09. Moreover, a separate sample of youth who had been diverted – not initially placed on probation in this time frame – was also used for select analysis.

Throughout the report the researchers compare cases of youth on formal probation with those on informal probation and examine which factors, including district, are associated with higher risk for recidivism. Cases of diverted youth were compared to those placed on probation for certain variables. Back on Track (BOT) risk assessment scores were used to determine the instrument's relationship to recidivism and services. The researchers also explored the multivariate relationships between demographic factors, types of crime, services, and recidivism. These variables and others were explored across the entire state, as well as evaluated individually according to judicial district. The main question the researchers addressed was: for youth on both formal and informal probation, which factors (including district) place a youth at risk for subsequent referrals (recidivism)? The terms "significant" and "significance" are defined in this report to indicate that a statistical association or finding was not occurring by chance but was established through mathematical modeling run through Statistical Package for the Social Sciences (SPSS) version 19 (see appendix 1). The study afforded opportunities for substantial statistical reorganization and analysis of the original data generated by OCA.

DESCRIPTION

Of the 1728 probation cases in the study, 1092 (63.2%) were on informal probation, 636 (36.8%) were on formal probation. 71 % of youth were male, 29% female. 81.6% were listed as Caucasian, 12.4% American Indian or Alaska Native, 3.6% Hispanic, 1.9% black, 1% Asian and 1% percent other. For analysis, variables were created for comparing Native American with all others and Caucasians with all others. Probation officers documented a referral for service for 56.1% of all youth in the study; this percent represents services which were paid for with general fund dollars (see appendix 3). Services the youth received that were paid for by other sources, for example private insurance or Medicaid, are not necessarily documented in JCATS. Collectively, 348 of youth on probation were charged with a felony (20.1%), 1175 with a misdemeanor (68.0%) and 205 with a status offense (11.9%). The most serious crime on the ticket

was broken down into 7 categories and the percent of youth charged with each can be seen in table 1. All crimes that youth were charged with by percent of sample are included as appendix 2.

Crimes by category	Frequency	Percent
Crimes against property	747	43.2%
Crimes against person	342	19.8%
Dangerous drugs	223	12.9%
Status offenses	205	11.9%
Crimes against public order	123	7.1%
Crimes against public administration	66	3.8%
Other	22	1.3%

Table 1

In the probation sample, 63.1% of youth were already active cases in the JCATS system as of 7-1-08 and the remaining 36.9 % of youth had no intakes with youth court prior to this date; they were new to the system in this timeframe and received their first disposition of probation (and a BOT assessment) during the year. 21.4 % of youth in the study had one prior intake, 12.1% had two prior intakes and 29.6 had 3 or more. Overall, the average number of prior intakes for this sample was 2.47. The average number of offenses on each intake ticket was 1.57, though 66.6% had only one offense which resulted in probation, 20.9% had two and 12.5% had 3 or more. These two variables – number of prior intakes and number of offenses on the intake ticket - were significantly and fairly strongly correlated ($r=.80$) indicating that youth with a higher number of prior intakes also had a higher number of offenses per ticket.

SERVICES

The study sought to determine if level of service correlated with level of risk as measured by the BOT and recidivism. An initial challenge to doing this was logically establishing *levels of service*, essentially attempting to turn a qualitative variable into a quantitative one. For example, is Sex Offender Treatment a higher level of service than a Psycho-Social Evaluation or Treatment/Drug Court? Additionally, is Electronic Monitoring equivalent or a higher/lower level of service than Corrective Thinking Classes or Drug and Alcohol Education (such as AA/NA or MIP classes)? While in most cases data was available which documented a referral for service, the frequency with which a youth saw a treatment provider and the length of time they were involved in a program or service system (two good proxies for level) were not. If a youth was referred to AA, how many times and how often did they go? To try to capture service for this study, a youth on probation was considered as having received a service if, at any time in their history with the court system, they had a referral to service paid for by state general funds as documented in JCATS. Service data was coded such that a youth who received any service was assigned a 1 for that variable and those who did not were assigned a 0. The number of referrals made for each youth across tickets was totaled and used as a proxy for level. A categorical list of all types of services received (which includes 24 categories) may be found in appendix 3. This indicates that a wide variety of services are being assigned for youth on probation.

Referral for service is a complex function of type of offense, offender behavior, service availability, family compliance, documentation and even transportation. For example, probation officers will not refer a youth to a service which they do not have the

transportation to attend. Some services are ordered directly by a judge, others agreed to a priori by attorneys and probation officers; some are voluntarily sought out by the youth and their families/guardians. Moreover, in many cases a referral may be advised but remains undocumented or disregarded.

Nonetheless, across all districts, 56.1% of youth had a documented service, though it is likely that this percent is low as the JCATS system does not necessarily record services

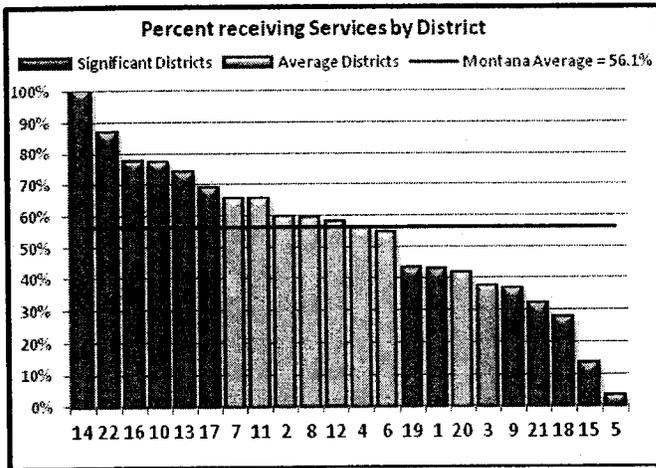


Chart 1

paid for by a source other than the general fund. The percent of youth receiving a documented service varied significantly by district (see chart 1). Moreover, many youth were either simultaneously or subsequently referred for an additional service (an average of 1.5 referrals per youth statewide) and this varied significantly by district (see chart 2). "Significant Districts" are those that are statistically different than average.

A cross tabulation between documented service and recidivism was run indicating that the 968 youth receiving a service referral are more likely to recidivate (62.1%) than the 754 who did not receive a service referral (51.2%). This initial finding is explored further in the more complex recidivism model presented and discussed below. Moreover, the overall average number of dispositions in the study timeframe for youth receiving a service (2.24) is significantly higher than those not receiving a service (1.97), ($p < .05$). Service recipients in general are a more troublesome group of juvenile offenders being both more likely to have *any* further difficulties and *more of it* when they do.

Youth who received a documented service were compared to those who did not, across a variety of other variables. Youth with a service referral had an average of 1.60 offenses on their ticket compared to 1.53 for those without a documented service referral; this is not a significant difference ($p > .05$). Moreover, there is no significant difference with regards to prior court intakes: those with a service referral had an average of 2.39 compared to 2.57 for those without a service referral.

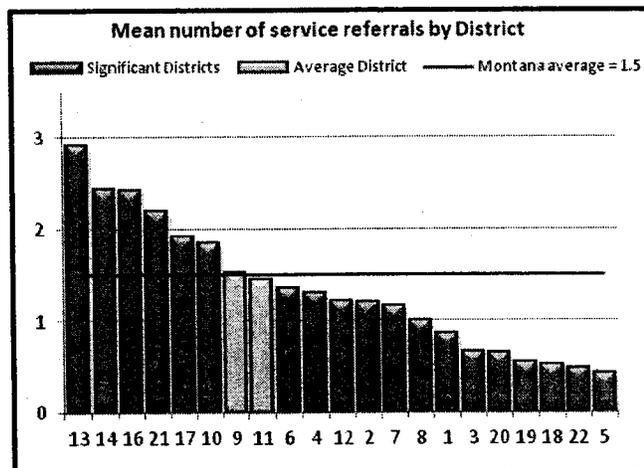


Chart 2

The BOT instrument and scoring is described thoroughly in appendix 1. The BOT was compared to risk level in several ways. First, the percentage of those receiving service which scored in each of the three BOT levels was compared to those who did not receive a service (see chart 3). There is no significant difference between service receivers and non-receivers with regards to risk level. Next, level of service (number of service referrals) was correlated with level scored on the BOT across three administrations of the BOT, as many youth had been administered multiple BOT's over time. This resulted in a significant positive correlation each time ($r=.21$ to $.22$; $p<.01$) indicating that youth with higher risk as measured by the BOT were receiving more service referrals.

Offense status was not significantly associated with receiving a service: felony, misdemeanor and status offenders were just as likely to be referred for service and

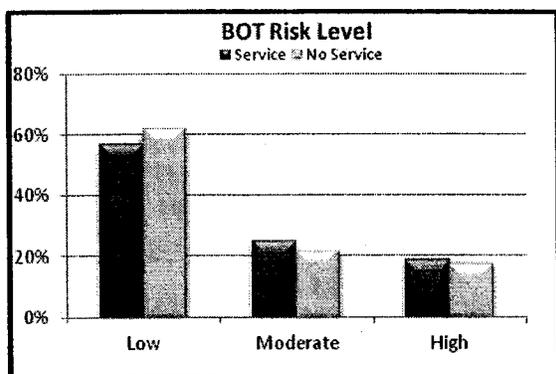


Chart 3

there was no significant difference in the number of service referrals they received. Males are no more likely than females and Native Americans no more likely than others to receive a service referral. Finally, district worker to youth ratio was not significantly associated with making a referral for service, though districts with less youth per worker did tend to refer less (50.9% of youth) than those with higher caseloads (58.0%). Districts with more staff appear to be relying less on community referrals to manage their caseload. Supporting this idea is the finding that number of referrals per youth is positively correlated with caseload ($r=.17$; $p<.05$). A more specific analysis of district caseload, number of youth served by the district and availability of community resources to refer to should be considered.

These findings concerning service referral are complicated and some findings are counterintuitive. With regards to recidivism, it is likely that higher risk youth (BOT) are receiving a referral for service, in districts where services are available, but continuing on to recidivate regardless. The complex factors associated with recidivism are more often interacting with one another and examination of these interactive relationships through analysis of a collection of predictors considered both individually and collectively, will prove informative.

RECIDIVISM: Individual Factors and Collective Predictors

Recidivism is perhaps the most important outcome variable in the study and raises a series of questions: Which youth were at higher risk than others to recidivate? Are youth in some districts at higher risk than others and why? What role does a service referral play in recidivism? Is the BOT (overall risk level) significantly associated with recidivism? Are youth on diversion at higher or lower risk than those on probation? And

finally, which other factors, when entered into a statistical model simultaneously with other factors still hold predictive power?

Recidivism was defined as receiving a referral to the court for a new ticket. Any case which had a second referral in the study timeframe was coded 1 (recidivated); those which did not have a second referral were coded 0 (did not recidivate).

The number of subsequent referrals received by our probation sample population ranged from 0–27, though only 16.2% had 4 or more. No additional referrals were documented for 42.7% of the probation sample while 57.3% received at least one additional referral (recidivated). The number of subsequent referrals received by our diversion sample population ranged from 0–36, though only 6.5% had 4 or more. Zero additional referrals were documented for 57.4% of the diversion sample while 42.6% received at least one additional referral. The proportion of youth on diversion who recidivated at all is significantly lower than the proportion of youth on probation (formal or informal) who recidivated ($p < .05$). Also, an independent sample t-test reveals that mean number of subsequent referrals for youth on diversion (1.16) is significantly lower than the mean number of subsequent referrals for youth on probation (1.76; $p < .05$).

Appendix 4 is organized in descending order by percent of youth on diversion for each district. For example, 89% of cases in district 20 are on diversion (the most) and 15.6% of cases in district 14 are on diversion (the least). The right hand column shows the total number of youth in each district, diversion and probation total. Interestingly, the percentage of youth on diversion and the total number of youth in the district are significantly and strongly correlated ($r = .528$; $p < .01$). The percent of each youth who recidivated after being placed on diversion, formal probation and informal probation are displayed by district.

Ideally, a time-linear sequence of events: ticket→intake→disposition→BOT→service→recidivism / no-recidivism would be established to insure that the events used to predict recidivism occurred prior to the event. However, the probation data set did not always present a perfectly time-linear sequence. For example, subtracting the date at which the BOT was administered from the date at which a referral for service was initiated often resulted in negative days. In essence, the referral was made before the risk level was established. In practice, this makes sense as a service may be assigned immediately upon contact with the court system; it was challenging to establish whether or not risk level, as identified by the BOT, was a prior consideration in referring for a particular service. Nonetheless, associations between BOT, other variables in the study and recidivism proved useful and informative.

In examining recidivism trends in this population, gender, race, district, district caseload, probation status (formal or informal), diversion, type of offense, number of offenses, BOT scores, and mental health / substance abuse referrals were explored for significance. Initially, uni-variate statistics - those that simply examine relationships between two variables, one of them always being recidivism - were used for exploration. This is a good and necessary first step in determining which variables

should be considered in relationships together when building a multivariate model. Caution must be taken when interpreting the following uni-variate results as they often belie the complexity of interrelationships between real-world behaviors, events, and indicators being measured.

Gender and Race

Cross-tabulations were run for the variables of race (White/other; Native American/other), gender and recidivism. Results indicate that one's gender or race is not significantly associated with recidivism; boys are no more or less likely to recidivate than girls, Native Americans are no more or less likely to recidivate than others.

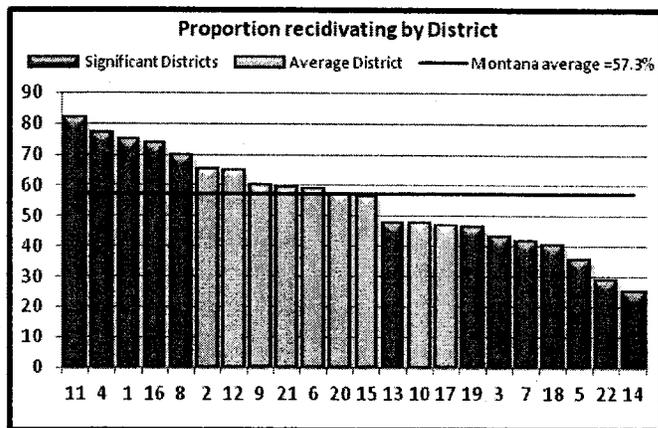


Chart 4

“Significant Districts” are those that are statistically different than average. Secondly, the average number of subsequent referrals per youth per district was compared to the statewide average of 1.76 using a series of t-tests. Results are graphed in chart 5, with significantly higher and lower districts identified. It is important that these outcomes be examined in light of other predictive variables; following is an examination of additional single variable associations with recidivism and this is followed with a multivariate statistical model.

District Caseload

The relationship of district caseload to recidivism was initially looked at in two ways. Cross-tabulations were run for the variables of district caseload and recidivism. As caseload increases, recidivism rate significantly increases. Districts with <200 youth and with 1 staff per 35 cases had a recidivism rate of 46.4%; those with

Districts

To determine which individual districts had a significantly higher or lower proportion of youth on probation who recidivated, two approaches were taken. Each district was statistically compared to the overall recidivism rate of 57.3% using both a chi-square and, where confirmation was needed, a binomial test. The proportion of recidivism for each district is graphed in chart 4 and significantly higher and lower districts identified.

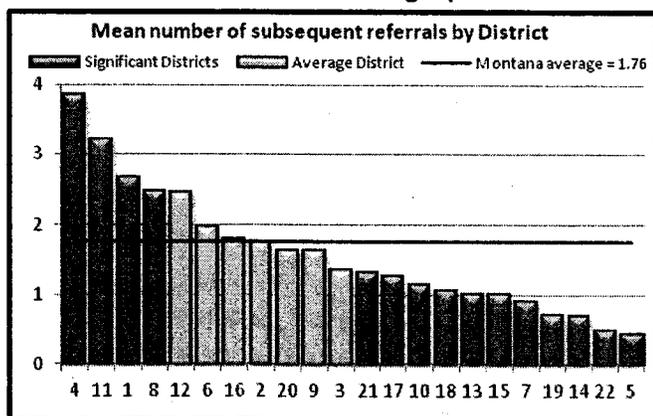


Chart 5

200-500 youth and 1 staff per 50 cases had a recidivism rate of 57.9%; those districts with >500 youth with 1 staff per 65 cases had a recidivism rate of 63.9%. The variable of district case load (rated on a 3 point scale) was also correlated with the average number of additional referrals. There was a relatively weak ($r=.17$) but significant ($p<.001$) positive correlation. In this single variable analysis, districts with a higher number of youth per staff appear to have a higher number of new referrals generated per youth under supervision. However, when additional factors are considered, as they are in subsequent multivariate models, this finding is somewhat mitigated. Caseload does continue to play a role in recidivism, albeit a complicated one best examined district by district.

Formal or Informal Probation

Formal or informal probation status was initially examined for association with recidivism using a simple cross-tabulation and chi-square statistic which showed that across all districts, youth on formal probation recidivated at a significantly higher rate than youth who were on informal probation ($p<.01$). Of the total 636 youth on formal probation, 66.0% recidivated. Of the total 1092 youth on informal probation, 52.3% recidivated.

Youth on Diversion Compared to Those on Probation

Of all youth initially diverted 42.6% recidivated through 12-1-10. Of all youth placed on probation (formal or informal) 57.4% recidivated. A binomial test for proportions was run and indicates that the percentage of youth on probation who recidivate is significantly higher than the percentage of diverted youth who recidivate ($p<.01$). The average number of subsequent referrals was 1.16 for diversion youth and 1.76 for youth on probation; this is also a statistically significant difference (one-sample t-test, $p<.01$).

The results indicate that in the long run, youth on probation are more likely than those on diversion to get another ticket and disposition, and that they accumulate significantly more case dispositions than those who are initially diverted. This makes sense in that youth placed on probation at their first disposition had more serious offenses to begin with and were initially perceived by the court to be at higher risk. A significantly higher percentage of youth on probation had committed a felony (20.1%) compared to those on diversion (1.5%). Misdemeanor offenses were similar (probation 68.0%; diversion 70.4%); 11.9% of probationers committed status offenses compared to 28.0% of diversion cases. A more comprehensive view of all youth on probation (formal and informal) and youth diverted by percent of youth in the district as well as recidivism rate for each may be found in appendix 4.

Felony, Misdemeanor, Status Offense

For the 1728 youth on probation, the type of offense (felony, misdemeanor, or status) was examined for association with recidivism using a simple cross-tabulation and chi-square statistic. This showed that the 348 youth with a felony are at lowest recidivism risk (49.4%); while the 1175 youth with a misdemeanor recidivate 58.7% of the time,

and the 205 status offenses recidivate 62.9% of the time. It makes sense that youth on probation for a felony charge are recidivating less, as the seriousness of their behavior makes them subject to increased attention and monitoring by probation officers. The profile was different for those on diversion.

For the 3590 youth on diversion – they were not placed on probation when their ticket was disposed of - the type of offense (felony, misdemeanor, or status) was also examined for association with recidivism using a simple cross-tabulation and chi-square statistic. This showed that of the 53 diverted youth with a felony, 47.2% recidivated; the 2530 youth with a misdemeanor 44.3% recidivated, and of the 1007 status offenders 38.2% recidivate. For those on diversion, it is the felony offenders who are recidivating at a significantly higher rate. Unlike the 20.5% of the probation sample with a felony who are at lower risk of recidivating, the 1.5% of the diversion cases with a felony are at higher risk of recidivating. While these felony offending youth were diverted – not placed on either formal or informal probation - they warrant an increased level of scrutiny.

Further examining trends for felony, misdemeanor, or status classification as percent of probation cases across 5 separate referrals revealed significant differences. At the time of the first referral 20.1% were charged with a felony, 68.0% with a misdemeanor and 11.9% with a status offense. At the time of second referral 14.9% had a felony, 66.4% a misdemeanor and 18.7% a status offense. This trend continues through the third (11.8% felony, 66.2% misdemeanor, 22.1% status), fourth (8.7% felony, 63.8% misdemeanor, 27.5% status) and fifth (10.1% felony, 67.3% misdemeanor, 22.6% status) referrals. A significant number of cases move across the three offense categories but in general, as youth accrue additional referrals these are more likely to be for status offenses (curfews violations, runaway, MIP, ungovernable) and less likely to be for a felony. Once youth are supervised on probation, formal or informal, their behavior is more closely monitored and status offenses come to the court's attention more often; as they are under increased supervision, they are less likely to engage in a felony.

All youth crimes were placed in 7 different categories: crimes against person; crimes against property, crimes against public administration, crimes against public order, dangerous drugs, status offenses and others. These categories were cross-tabulated with recidivism to see if any particular category of crime had a higher recidivism rate; no category was significantly associated with recidivism (chi-square $p > .05$).

Number of Offenses on the Ticket

For probationers, the relationship between the number of offenses on the ticket and recidivism was examined by comparing the average number of offenses on the ticket for those who recidivated (1.61) with the average number for non-recidivists (1.51). The difference is not statistically significant; the number of offenses on the ticket is not associated with recidivism.

Back On Track

The BOT is a complex instrument with a substantial track record of multiple scales and subscales proving reliable and valid (see appendix 1). The simple '1,2,3' scores used for this study understates the utility of the various valuable risk domains used regularly by probation offices in the field for decision making. Nonetheless, analysis is undertaken here to explore associations between simple risk level over time and various other points of data.

The mean score for the first BOT administration for youth on probation who received a BOT was 1.60. The mean score on the second assessment was 2.02. A paired samples t-test indicated that this was a statistically significant difference ($p < .01$). Moreover, the mean score of the BOT for each administration up through the fifth was compared to the mean score of the previous administration, and in every case the BOT recorded a significantly higher risk level ($p < .05$). This indicates that the BOT instrument is reliably reflecting an increased level of risk each time it is administered to the juvenile offender. It is important to note that the ceiling score is fixed at "3" and this point blunts additional risk factors. In other words, not all risk level 3 youth are the same, as some have substantially qualitatively and quantitatively different offense and behavioral issues. Moreover, criminal offenses are fixed and do not decrease over time. Thus, the base is fixed. This is part of the reason the BOT risk level reliably increases over time. 18.2% of youth statewide scored in the high risk category, though this varied widely by district (see chart 6). "Significant Districts" are those that differed statistically from the rest of the state, being either higher or lower.

The relationship between BOT scores and recidivism for youth on probation was examined. Cross-tabulations were run for the variables of BOT and recidivism, looking at the 1st (and where available 2nd and 3rd), administration of the BOT.

Youth with higher BOT scores are at significantly higher risk to recidivate. Those scoring 1 on the BOT, had a recidivism rate of 46.5%; those with a score of 2 had a recidivism rate of 70.6%; those scoring 3 had a recidivism rate of 75.2%. The BOT was administered a second time to 815 of the youth in the study and again, youth with higher scores are at higher risk. Those scoring 1 recidivated 58.6% of the time; those scoring 2, 70.9% of the time and with a score of 3, 77.2% recidivated again. This trend continued with subsequent administrations of the instrument.

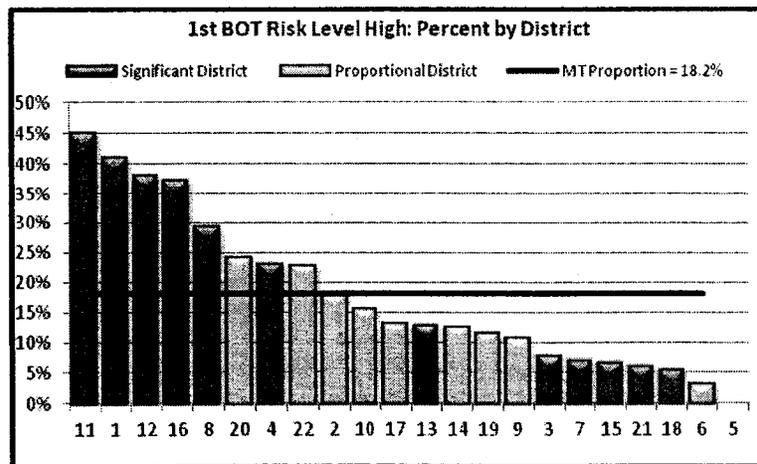


Chart 6

These results indicate that the BOT is accurately predicting risk: exactly what it is designed to do. Districts with a significantly higher or lower proportion of high risk youth (relative to the proportion statewide) are shown above in chart 6. BOT, district and recidivism are examined in concert with additional variables in a later multivariate model.

Collective Predictors – A Multivariate Model

For youth on probation, the preceding findings indicate that across referrals, those who were on formal probation, were supervised in specific districts, had a felony, received a service, and were high risk according to the BOT, were the most likely to recidivate.

Variables	Significance (p.<.05)	Predictive power
BOT 1 Risk Level	.00	1.85
Formal/Informal	.00	1.69
Service/No Service	.00	1.54
Status Offense or Other	.02	1.44
District Case Load	.00	1.26
Felony Offense or Other	.00	-0.43

Table 2

Therefore, these and other variables were entered into a multivariate statistical model to determine which, when acting collectively, were still associated with recidivism. The basic model displayed in table 2 includes the significant predictors. The outcome was simply recidivism: any additional disposition in the study timeframe.

These results confirm that all variables in the model, with the exception of being a felony offender, are positively associated with recidivism. For example, despite the influence of other variables, youth on formal probation are more likely to recidivate than youth on informal probation: 1.69 times more likely. Youth from districts with a higher youth to staff ratio are also more likely to recidivate, all other factors considered. For felony offenders, the outcome is a negative risk: they are less likely to recidivate. This confirms the uni-variate finding above that more serious offenders were recidivating less. Race and gender are not associated with recidivism and are not represented in the table; only significant predictors were included. This model informs OCA which factors are associated with increased risk for recidivism and these may be the focus of policy and practice planning.

The next step was to examine individual districts one model at a time. Each district was coded so that a youth from that district received a 1 and youth from all other districts received a 0. Following this, 22 separate models were run, one for each district which included the 6 core variables from above *and* the individual district as a predictor of recidivism. The model for each district looked exactly like table 2 except that it included a variable for the district. While 991 (57.3%) of the cases in the sample had one additional referral, 630 of these (36% of the sample) went on to receive 2 or more additional referrals and a predictive model for each district was also created for these multiple recidivism cases. The outcome of the statistic used (binary logistic regression) indicates that if a district scored exactly 1, it was no more or less likely than all other districts combined to have a youth recidivate. Those significantly above 1 have youth at

higher risk: the higher above 1 the higher the risk; those significantly below have youth at lower risk: the further below 1 the lower the risk, all other factors considered. For

High Risk Districts	1 new referral	2+ new referrals
(11) Flathead	2.23	2.47
(1) Lewis and Clark, Broadwater	1.69	1.86
(2) Silver Bow	1.68	*
(8) Cascade	1.65	*
(4) Missoula and Mineral	1.64	2.69
Low Risk Districts (*=neutral district)	1 new referral	2+ new referrals
(18) Gallatin	-0.65	*
(13) Yellowstone	-0.35	-0.21
(14) Golden Valley, Meagher, Musselshell and Wheatland	-0.31	*
(22) Big Horn, Carbon and Stillwater	- trend	-0.24
Neutral Districts	1 new referral	2+ new referrals
(3) Deer Lodge, Powell and Granite	*	*
(5) Beaverhead, Jefferson and Madison	*	*
(6) Park and Sweet Grass	*	*
(7) Dawson, Richland, McCone, Wibaux, and Prairie	*	*
(9) Glacier, Pondera, Teton and Toole	*	*
(10) Fergus, Judith Basin and Petroleum	*	*
(12) Hill, Choteau and Liberty	*	*
(15) Roosevelt, Sheridan and Daniels	*	*
(16) Carter, Custer, Fallon, Garfield, Powder River, Rosebud and Treasure	*	*
(17) Blaine, Phillips and Valley	*	*
(19) Lincoln	*	*
(20) Lake and Sanders	*	*
(21) Ravalli	*	*

Table 3

many districts, they did not differ significantly from 1 and are considered neutral. Table 3 shows risk level for all districts: high, low and neutral.

Thirteen districts were risk-neutral. The models indicate that 5 districts (11, 1, 2, 8, 4) are significant predictors of higher recidivism risk for youth on probation relative to their cohort districts statewide. These districts should be examined qualitatively to explore what exactly about their local characteristics or practice is increasing risk for recidivism. Conversely, four districts (18, 13, 14, 22) have youth at significantly decreased risk of recidivism for youth on probation relative to their cohort districts statewide. For district 22, the trend was not initially significant ($p < 0.06$), but it was significant for 2+ referrals. These four districts should be examined qualitatively to explore what exactly about their local characteristics or practices are decreasing risk.

FORMAL AND INFORMAL PROBATION: COMPARISONS

Youth on formal probation were compared with cases on informal probation across a variety of other variables. It is clear that these are two very different populations of youth. A series of independent samples t-tests were run comparing youth on formal and informal probation for the following variables: number of offenses on intake ticket; number of subsequent referrals (a recidivism measure); number of intakes in JCATS prior to the start of the study; and risk level as measured by the BOT administered up to three times. Table 4 shows how these two groups of youth differ significantly across these various characteristics. All differences are statistically significant (t-test; $p < .01$).

Moreover, the variable of formal / informal probation was cross-tabulated with other categorical variables to further determine how these two subsets of the sample may differ. Youth on formal probation were significantly more likely to recidivate (66.0%)

Variables	Informal Probation	Formal Probation
Number of offenses on intake ticket	1.36	1.93
Number of later intakes/referrals	1.46	2.27
Number of prior intakes/tickets	1.21	4.66
Mean Risk Level at 1st BOT	1.40	1.94
Mean Risk Level at 2nd BOT	1.76	2.30
Mean Risk Level at 3rd BOT	2.01	2.52

Table 4

than those on informal (52.3%). Of the 630 cases that accumulated a 2nd or subsequent disposition beyond their original, the formal cases were also more likely to have further recidivated: 46.2% compared to 30.8% of informal cases.

As expected, significantly more youth on formal probation have felony charges and more youth on informal probation have status and misdemeanor charges (See chart 7).

76.2% of formal probationers are male compared to 67.9% of informal probationers. Across cases, males are more likely than females to be on formal probation. 15.6% percent of youth on formal probation are Native America while only 10.5% of youth on informal probation are Native, indicating that Native youth are more likely to be placed on formal probation. This could be partly a function of geography as there is wide variety of racial distribution across districts. These variables (gender and race) are examined more thoroughly below.

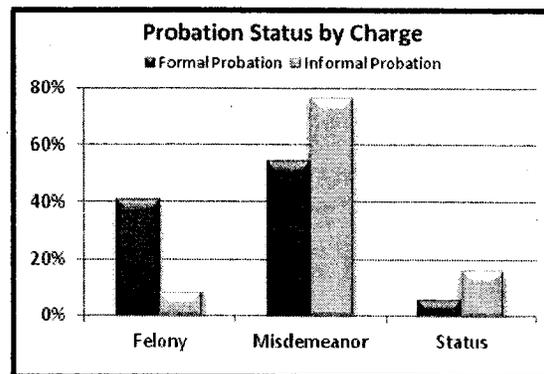


Chart 7

Multivariate Associations with Probation Status

Variables	Significance (p.<.05)	Predictive Power
Felony Offense or Other	.00	6.83
Status Offense or Other	.00	-0.42
Native American or Other	.03	1.49
Number of Prior Intakes	.00	1.47
Offenses on Intake	.00	1.39

Table 5

In order to see if the relationships between the individual variables explored above remained significant when looked at together, they were entered into a multivariate model (binary logistic regression). Results indicate that most variables remain associated as described above. What

this model shows us is that youth with a felony are 6.8 times more likely to be placed on formal probation than youth with either a misdemeanor or status charge. Youth with status offenses are less likely to be placed on formal. Native Americans are more likely to be on formal probation and youth with more prior intakes and more offenses on intake are also more likely to be on formal probation.

DISCUSSION

A wide variety of documented services are assigned to youth throughout the state; this varies greatly from district to district though in general referrals are associated with high BOT risk scores, caseload, and the offender's history with the court. More specific research looking at reasons for the variability across districts could be best be accomplished if all services referrals by category for all youth were more thoroughly documented in JCATS. This should include services paid for by general funds, Medicaid, CHIP, private insurance, private pay etc. Moreover, currently, quantity and frequency of service contact are not tracked using a method that allows this to be linked to other variables of interest, such as risk and youth history. Improved tracking leading to this outcome would likely prove of value to OCA.

Of all youth in the study, those on formal probation for a status or misdemeanor crime in districts with a lower number of workers per youth and who received a service referral were at higher risk for recidivism; felony offenders were less likely to recidivate, probably due to the increased scrutiny of probation officers. Moreover, youth who have been in the JCAT system for a longer period of time and who had more intakes were at higher risk for recidivism as were those who received a service referral. These factors should be taken into account by officers across districts when managing youthful offenders.

BOT is the most powerful and resilient predictor of recidivism. Not only does it consistently predict youth who will recidivate, its association with being placed on formal probation is irrefutable: youth at higher risk are on formal probation. The likelihood of a youth remaining on *informal* probation decreases with each successive referral. This indicates that recidivists are being more highly supervised at each step in the process. The BOT is capturing and condensing much valuable information across 12 domains and, while it results in a simple three-point scale, it is reliably associated, categorically and continuously, with recidivism, service referral and being placed on formal probation.

All other relevant available factors considered, several districts remain associated with youth being at lower risk for recidivism, while other districts are associated with youth being at higher risk for recidivism. This finding should be interpreted cautiously in light of the role played by probation status, staff to offender ratio, service availability, BOT risk level. Nonetheless, the characteristics of probation practices in the districts with lower recidivism should be looked at to determine if they can be replicated in the districts with higher rates. Further collaborative efforts that include conferencing between the researchers and court administrator personnel would likely result in better understanding of effective dynamics and characteristics of more effective districts. It may be that districts with youth at higher risk are impacted by contextual factors over which they have no control such as lack of service providers, noncompliance and fewer payer resources. It is possible judicial practice varies by district. Certainly, the use of diversion is very inequitably practiced (as appendix 4 indicates). Standardization or further diversification of offender status management strategies, (i.e. placing a youth in diversion, on formal or informal probation) may be explored by OCA administration.

To potentially improve the quality, quantity and capacity of care for these youthful offenders the research team offers future recommendations for the OCA. Primarily, in order to completely assess a particular variable or set of variables likelihood of increasing or decreasing a youth's capacity to recidivate, a longitudinal study of the youth should be completed. A longitudinal, multi-year study will allow the OCA to clearly determine what services and characteristics impact recidivism and allow for the treatment of these youth to be more specific to the needs of both the youth and the community. Such a study would address the overlying concern regarding the representativeness of the sample. Along with providing the OCA with a clearer picture of recidivists by using a longitudinal study method, the research team also suggests exploring the use of resource mapping across districts.

All service referrals should be more thoroughly tracked by type, duration, and district. Actual treatment contact hours should be followed so association with other variables can be statistically explored. Availability of various types of services and providers should be explored. Resource Mapping is a system building process that empowers a district to assess all existing resources and services; it is a cost effective way for the state of Montana to create databases inventorying all existing services, avoid costly duplication of services and resources, increase competition for financial resources managed by OCA, identify which services provide greater opportunities for success, identify existing gaps in services, and aid in the development of new needs based programs. Resource mapping has proven to be a valuable tool for rural communities such as Montana and could greatly increase the quality and quantity of service provided to these juvenile offenders. Moreover, this process would afford OCA the opportunity to examine whether or not existing services are evidence-based, in essence supported by research documenting their efficacy, or not. For example, the BOT risk assessment tool is an empirically supported reliable and valid assessment system in use statewide. Treatment models, like assessment models, may also be supported by evidence of effectiveness and it is these models that OCA should be encouraging when it supports a referral for services.

The office of Court administrator in collaboration with the University of Montana was able to assemble a high-quality data set, which was cleaner than your average social science data set, behaved well statistically, and which easily passed the bar with regards to basic reliability and validity issues. Efforts to maintain high quality recording of case related data should be sustained and future collaborative efforts planned.

APPENDIX 1: Methodology

Data Collection

Montana Code Annotated 41-5-215 (2)(k) and 41-5-216 (11) granted the researchers access to any and all OCA records pertaining to juvenile offenders and their therapeutic placement. Data collection methods included gathering existing data from JCATS, an electronic data management system used by the OCA. The research team secured a variety of data extracts in Microsoft Excel© spreadsheets from the OCA Data Compliance Monitor/Trainer. Once this information was compiled, it was reviewed by the researchers prior to being coded into variables and converted from Excel© to Statistical Package for the Social Sciences (SPSS). The OCA suggested specific variables for collection, and the researchers added to these as the work progressed. After collecting, reviewing and coding these variables, any inaccuracies or discrepancies in the SPSS data set were reconciled by the researchers in collaboration with the OCA. While this process had worked effectively in the past, when working on this report there was substantial miscommunication by all parties. This could be avoided by having future researchers conduct at least the data collection and organization portion of the study on-site at the OAC offices in Helena. Eventually, the data was subjected to extensive exploratory analysis to ensure that it met the mathematical assumptions necessary for more complex statistical processing.

Back On Track

The probation study sample purposely consists of youth who were both on probation and had received a BOT assessment that was entered into JCATS. BOT was the most consistent and powerful variable associated with recidivism. The Back on Track youth risk assessment instrument was created in 1998 by the Washington State Institute for Public Policy, working together with the Washington Association of Juvenile Court Administrators and Assessments. The BOT includes both an initial pre-screen, and a full assessment. The pre-screen has approximately 30 question items, and is divided into three domains: record of referrals, social history, and attitudes and behaviors. The full screen has approximately 90 questions, 30 of which are identical to those found in the pre-screen; this is further divided into 12 domains which include record of referrals, demographics, education, use of free time, employment, relationships, family, alcohol and drugs, mental health, attitudes and behaviors, aggression, and skills. The full screen incorporates both static and dynamic risk factors, and is directly transferable to client intervention and supervision. The BOT also incorporates protective factors which are shown to mitigate risk. Because the determinate risk level behaves the same for both the pre-screen and the full BOT, we have not differentiated between the two in our data set. However, it is useful to note that it is the full BOT which should be used for case planning. The BOT ranks youth on a 3 point risk scale with 1 being lowest and 3 being highest risk. For this study, mean BOT scores were computed using the scale of 1 (low) to 3 (high). Statistically, the mean scores for this population ranges across scale categories and are not discretely meaningful, because each individual youth can only

score a flat risk level one, two, or three. However, it proved useful to use the mean to determine what other variables, like recidivism, are associated with the BOT.

Statistical Methods

Analysis of data employed several statistical methods. Initially, simple frequencies were used to examine the variables, and preliminary correlations and cross-tabulations explored potential significant relationships between both individual and grouped variables. These are reported in text throughout. For this report, the terms "significant" or "significantly" are used to indicate that statistical testing established (or failed to establish) a relationship or association between variables which, according to the mathematical laws of probability, is not due to mere chance. If the probability of the relationship occurring by chance is less than five percent ($p < .05$) it is considered a non-chance finding. In many cases ($p < .01$) indicates that the chance of error is less than 1 on a hundred.

Following initial examination, both univariate and multivariate methods were employed. Univariate statistical methods examine the relationship between two variables. For example, univariate statistics can address the question: Is being new to JCATS associated with recidivism? In this case, we are examining a simple association between one predictor variable (i.e., being new to JCATS) and one outcome variable (i.e., recidivism). This was completed across a series of variables and is reported either in the text or as table footnotes, though, it was also used as a building block and predecessor to the multivariate models.

The two univariate statistics used in this study were chi-square analysis and t-tests. Chi-square analysis is used when exploring relationships or differences between categorical variables, that is, variables that capture information within categories, such as recidivism, service / no service and the presence or absence of a particular crime. T-tests are used to examine differences in the mean of a continuous variable, such as number of prior intakes, and number of services reported in relation to the grouping variable. With a t-test, the mean of the continuous variable (i.e., number of prior intakes, average score on BOT) is compared for two groups of juvenile offenders (i.e., recidivists and non-recidivists) in order to see if there is a significant difference. If there is a difference, then the continuous variable is considered a good candidate for use in a multivariate predictor model. In other words, if there is a significant difference in the number of prior intakes between recidivists and non-recidivists, then the number of intakes prior to placement is a good potential candidate for predicting recidivism in the more complex, multivariate model.

One multivariate statistical method was used to build predictor models for this study: binary logistic regression, which is a form of multiple regression. In multiple regression, there is a single outcome variable, such as recidivism/non-recidivism or formal probation/informal probation. Several predictor variables are used simultaneously to determine the likelihood that the outcome variable will occur. The procedure also determines if the relationship between specific predictor variables and the outcome

variable is statistically significant or could have occurred by chance. For example, when trying to predict recidivism, the researchers were able to look at several predictor variables together, such as: BOT risk level and number of intakes prior to placement, along with others, in order to determine if one or more of these variables is predicting the outcome. This allows the researchers to examine the effect of each variable together with the effects of all other variables in the model, that is, to examine them *all things considered*.

In exploring differences between recidivists and non-recidivists, several variables were run in a series of t-tests (for continuous level variables) and crosstabs (for nominal/categorical variables), to determine which variables would be strong candidates for inclusion in a multivariate predictor model. Significant differences of $p < .05$ indicate potential for inclusion.

Some categories of variables needed to be broken down into so-called "dummy variables" to further examine their relationships to other variables using chi-square statistics and cross-tabulations (referred to as crosstabs in the report). This was how we were able to compare individual districts with all others. This was done for all districts (eg. Yellowstone = 1 all others = 0; Ravalli = 1, all others = 0 etc.)

APPENDIX 2: Most serious crime at first offense

The categories below list the most serious offense at time of first referral (for youth on probation) along with the percentage of the sample falling in that category.

Theft and burglary	524	30.3%
Assault and assault related	273	15.8%
Drug related	224	13.0%
Criminal mischief and trespass	213	12.3%
Obstruction/Contempt/Disorderly	161	9.3%
MIP	96	5.6%
Ungovernable	48	2.8%
Runaway	37	2.1%
Sex offenses	31	1.8%
Endangerment	25	1.4%
City ordinance/Technical violations	20	1.2%
Arson	17	1.0%
Juvenile curfew	12	0.7%
Other (stalking, false reports and comm. violations)	12	0.7%
Truancy	12	0.7%
Stalking	11	0.6%
Weapons possession	8	0.5%
Homicide	3	0.2%

APPENDIX 3: List of all services that youth were referred to

Drug and Alcohol Education:

AA/NA
meetings, ACT Program, MIP
Classes

Pro-Social Activity Support:

Adventure Recreation, Summer
Activity Program

**Mental Health Treatment/ School
Based:**

After school/ day school
reporting, after school programs,
Day Treatment

Corrective Thinking Classes:

S.M.A.R.T.,
Anger Management classes,
Arson Education, Shoplifting
class

Employment Services: Opportunities,
Career Explorations

Individual Counseling: Dialectical
Behavioral Therapy, Equine
therapy, Moral Reconciliation
Therapy

Family Counseling: Functional Family
Therapy

Family Support Services: Family
Mediation, Transportation
services, Wrap-Around services,
parent education, Parenting
Wisely Class, Therapeutic Aide,
Tutoring, Basic needs
assessment, Runaway services,
Child Information Team,
Mentoring, Family group
conferencing, Parent-only
counseling, Peer Court, Physical
Examination, Neuro-feedback

Life Skills Program: Independent
Living skills

Sex Offender Treatment (outpatient):
Polygraph

Drug Court: Treatment Court

Case Management: Intensive Case
Management

Risk Assessment: Psychosocial
assessment

Alternative Education Program
Chemical Dependency Treatment
(OP)

Restitution

Youth Tracking Services

Electronic Monitoring

Victim/Offender Mediation

Group Counseling

Evaluation for each:

**Drug and Alcohol, Mental
Health, Neuro-Psychological,
Psychiatric, Psychological, Sex
Offender**

Psychiatric Mediation Evaluation

Community Council

Community Service (Prior to FY08)

APPENDIX 4: Probation Status and Recidivism by District

District #	Diversion	Diversion Recidivism	Informal Probation	Informal Probation Recidivism	Formal Probation	Formal Probation Recidivism	Formal Prob. Recidivism	Number of Youth
20	89.0%	42.3%	5.3%	61.5%	5.7%	53.3%	53.3%	209
11	85.7%	46.8%	5.8%	87.1%	8.5%	77.5%	77.5%	609
16	79.4%	30.3%	6.5%	60.0%	14.1%	78.6%	78.6%	248
8	77.3%	41.2%	12.3%	69.9%	10.3%	69.6%	69.6%	843
1	73.7%	40.7%	11.5%	70.0%	14.8%	78.8%	78.8%	547
12	73.6%	35.1%	9.3%	50.0%	17.1%	72.7%	72.7%	193
2	70.2%	43.2%	23.4%	66.2%	6.4%	60.0%	60.0%	359
6	69.6%	45.7%	22.5%	60.0%	8.0%	55.6%	55.6%	138
4	66.3%	37.5%	16.7%	76.4%	17.1%	77.3%	77.3%	720
15	63.4%	66.7%	34.2%	50.0%	2.4%	100.0%	100.0%	41
21	62.9%	37.9%	35.0%	58.1%	2.1%	80.0%	80.0%	280
18	58.9%	45.5%	30.6%	37.0%	10.4%	50.0%	50.0%	297
22	42.5%	61.3%	46.6%	35.7%	11.0%	14.3%	14.3%	73
17	41.4%	26.5%	39.1%	41.2%	19.6%	53.6%	53.6%	133
13	40.8%	59.9%	34.9%	40.0%	24.3%	59.7%	59.7%	610
10	37.9%	35.1%	51.6%	43.8%	10.5%	62.5%	62.5%	95
9	36.0%	52.8%	45.8%	57.1%	18.3%	65.2%	65.2%	153
5	32.9%	41.7%	48.6%	35.7%	18.6%	33.3%	33.3%	70
19	25.0%	50.0%	55.8%	47.1%	19.2%	45.0%	45.0%	104
3	24.7%	41.2%	66.7%	39.1%	8.6%	80.0%	80.0%	81
7	18.3%	36.8%	75.8%	41.6%	5.9%	40.0%	40.0%	153
14	15.6%	60.0%	56.3%	15.4%	28.1%	66.7%	66.7%	32