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Minnesota Criminal History Score Recidivism Project

A publication by the Robina Institute of Criminal Law and Criminal Justice

UNIVERSITY OF MINNESOTA

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By Julia A. Laskorunsky

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Minnesota Criminal History Score Recidivism Project

Executive Summary

Minnesota Sentencing Guidelines increase the length and severity of recommended sentences based on the severity of the conviction offense and the offender's criminal history. This report analyzes the relationship between the guidelines criminal history score (CHS), its individual components, and recidivism to determine how well the score targets high-risk and dangerous offenders. About a quarter (24%) of all offenders recidivate within three years of release from prison or jail, or the start of probation. Findings show that the overall score predicts recidivism moderately well (0.64 area under the curve (AUC) statistic) and each level of the score is associated with a higher likelihood of recidivism. Other factors, such as offender age, interact with the score to affect risk of recidivism. Policy relevant suggestions include:

- Revise recommended sentences so that the greatest increases occur from CHS 0 to CHS 1 and then again from CHS 5 to CHS 6. Alternatively, consider enacting a first-offender discount for offenders with a CHS 0 who have no priors (pg. 10).

- Reduce the number of criminal history categories (e.g., by combining criminal history categories 4, 5, and 6 and disaggregating those with a score of 7 and above from CHS 6) to reflect more substantive differences in recidivism risk and to justify recommended increases in sentence length and/or sentence disposition (i.e. moving from recommended probation to prison) (pg. 9).

- Explore equitable ways to take into account offender age at sentencing – particularly for older offenders sentenced at the lower ends of the criminal history score (pg. 13).

Reformulations of the criminal history score suggest that some components of the score are low-performing or non-performing in identifying risk of recidivism. The Minnesota Sentencing Guidelines Commission (MSGC) could consider removing or altering components with little or no impact on the predictive power of the score - keeping in mind some of the tradeoffs associated with altering the score.

- Custody Status. In 2003, a large portion of offenders (33.5%) received a custody status point. The predicted probability of recidivism for offenders who have the point is 5 percentage-points higher than those who do not have the point. Retaining custody status in the criminal history formulation helps identify an additional 1 out of 100 recidivists (AUC 0.63 without custody statute vs. AUC 0.64 with custody status). In contrast, removing the custody status point moves 4,013 (30%) offenders into a lower criminal history score and yields reductions in the racially disparate impact of the score (pg.14).

- Juvenile Adjudications. Only a small portion of the 2003 sample (5%) received any juvenile adjudication points. Offenders who had a juvenile point were less likely to recidivate than those who did not (19%

vs. 25%). Not counting juvenile adjudications would have no significant effect on the predictive power of the score (AUC 0.64), but would move 668 (5%) offenders into a lower criminal history category and yield reductions in the racially disparate impact of the score (pg. 16).

- Misdemeanors. In 2003, 1,087 (7%) of offenders received at least one misdemeanor point. Offenders who received misdemeanor points were almost twice as likely to recidivate than offenders who did not (43% vs. 22%, respectively). Removing misdemeanors from the criminal history score formulation results in a slight decrease in the predictive power of the score (AUC 0.63), but would move 934 (7%) of offenders into a lower criminal history category and yield reductions in the racially disparate impact of the score (pg. 17).

- Felony Weighting. If we rescore the 2003 sample without weighting felonies (i.e., by adding 1 point for every felony offense regardless of seriousness, and exclude the custody status, juvenile adjudication, and misdemeanor points), 3,350 offenders (25%) would move into a lower criminal history category while 1,469 (11%) would move into a higher criminal history category. This change would also yield reductions in the racially disparate impact of the score. This new formulation has the same predictive power as the current criminal history score (AUC 0.64). But it would send more property offenders to prison, and for longer, which may conflict with other goals of the score. Thus, an alternative would be to remove felony upweighting while retaining other elements of the score (pg. 18).

Recidivism rates differ by conviction offense type, with property offenders recidivating at higher rates than person (violent or sex) offenders. All types of offenders show specialization in their crime type upon re-offense. Thus, while property offenders are more likely to recidivate, they are comparatively more likely to recidivate with a property crime and person offenders are comparatively more likely to recidivate with a person crime (although less likely to recidivate overall). Property offenders are disproportionately represented at the higher ends of the criminal history scale and are thus subject to the most severe criminal history enhancement. The criminal history scale is less effective at targeting offenders most at risk for a serious violent offense. Policy relevant suggestions include:

- Differentiate between recidivism type in future research and policy decisions (pg. 20).

- Cap the number of criminal history points an offender can receive for low-level property or drug offenses (pg. 23).

Though Minnesota's criminal history score has been justified on both utilitarian and retributive grounds, the findings in this report show that the design of the score is less justifiable on public safety grounds in that it does not reserve the highest enhancements for offenders most likely to commit another person crime or another high-severity crime.

INTRODUCTION

In November of 2016, the Robina Institute of Criminal Law and Criminal Justice ("Robina") commenced a project, with the assistance of the (MSGC) to analyze the relationship between the criminal history score in the Minnesota Sentencing Guidelines and offender recidivism. The goals of the project are to examine how well Minnesota's guidelines (CHS) predicts re-offending, to identify components of the score that do not add to its predictive validity, and to examine the relationship between the criminal history score and recidivism type.

The inclusion of the criminal history score in Minnesota's sentencing guidelines serves two purposes – one is to punish repeat offenders based on increased culpability and the second is to assign more punishment to offenders more likely to recidivate (MSGC, 1984, pp. 10, 12; MSGC 2018, cmt 2.B.103). This project is designed to examine whether the use of the criminal history score aligns with the utilitarian purpose of the score by giving longer sentences to offenders who are more likely to recidivate. The first part of the project examines the rate of felony re-conviction within 3 years of release at each level of the criminal history score for felony offenders sentenced in 2003 and provides an area under the curve (AUC) measure of the score in order to measure its predictive utility. The second part of the project examines individual components of the score to examine the effect of formula changes on predictive validity. The third part of the project examines the relationship between the criminal history score and recidivism type and severity. A supplemental analysis expands the recidivism measure to include misdemeanor convictions and looks at whether this changes the relationship between the score and recidivism (see Appendix C: Supplemental Analysis with Misdemeanor Convictions). Results are examined in the context of the utilitarian purpose of the score: is the score efficiently targeting offenders who are most likely to re-offend?

BACKGROUND

The Use of Criminal History Enhancements in Sentencing

The use of criminal history enhancements is ubiquitous in sentencing guideline jurisdictions (Frase, et al., 2015). Almost every guidelines jurisdiction uses some measure of criminal history to increase recommended sentences for offenders, although the calculation of the formula and the magnitude with which it increases the recommended sentence varies considerably. The use of sentencing enhancements has historically been justified on both retributive and utilitarian grounds (Roberts, 2015). Repeat offenders are viewed as deserving of longer and more severe sentences because they are seen as both more culpable for their current offense and because they are more likely to re-offend in the future.[1] Despite this, jurisdictions have rarely empirically examined whether their criminal history score is predictive of re-offending, and whether the movement of offenders across the grid is reflective of changes in recidivism risk.

Studies in two jurisdictions serve as the exception to the above rule: a study of the Federal criminal history score (U.S. Sentencing Commission, 2017) and an analysis of Pennsylvania's prior record score (PRS) (Hester, 2017). A U.S. Sentencing Commission report found that there are differences in the rearrest rates for offenders within different Federal Criminal History Categories (CHC). The authors showed that each subsequent category was associated with a higher rearrest rate, ranging from 33.8% for CHC 1 to 80.1% for CHC 6.[2] Prior research by the U.S. Sentencing Commission (2010) showed that a "recency point" – a point added for a recent offense – provided minimal additional predictive utility, yet substantially increased the rate of incarceration. This point was removed from calculation of the score in November of 2010 (U.S. Sentencing Commission 2016, App. C, amend. 742). Hester (2017) found that while an increase in the Pennsylvania PRS is associated with an increase in the rate of general rearrest, not all of the discrete PRS categories reflected true differences in recidivism likelihood. The PRS was

also less accurate at predicting violent rearrest, which was of particular interest to the commission. Hester noted that the guidelines pattern of recommending increased sanctions based on the PRS did not match up with the increases in levels of risk between the PRS categories.

Besides increasing incarceration rates, scholars have noted several other problems with the use of criminal history scores in sentencing (e.g. Frase et al., 2015; Hamilton, 2015; Roberts and von Hirsch, 2010). A major criticism of their use is their contribution to disproportionate minority confinement. Black, Hispanic, and Native American offenders tend to have higher average criminal history scores and are thus more likely to be recommended for prison commitment and for longer prison sentences based on criminal history enhancements alone (Frase and Hester, 2015a). Furthermore, there may be specific components of the score that increase the disparate impact on non-white offenders, but do little to increase the accuracy of the score in identifying recidivists. And, while many sentencing commissions have recognized disparate minority impact as a serious consideration in their policy decisions, almost no jurisdictions have examined the racial impact of their criminal history scores or its individual components.

Scholars have also pointed to the issue of reduced conviction-offense proportionality, which is due to the increasing magnitude of criminal history scores in sentencing decisions (Frase and Hester, 2015b). The greater the magnitude of prior-record enhancements, the less the sentence depends on the severity of the conviction offense – lowering the effect, and the importance, of the conviction offense in determining the final sentence. Similarly, scholars have pointed out that while criminal history scores target frequent offenders for the most severe punishment, they do not necessarily target the most serious or dangerous offenders (Frase and Hester, 2015b, Hester 2015). For example, non-violent offenders tend to have the highest recidivism rates (Alper et al, 2018; Langan and Levin, 2002). Thus, criminal history scores may be contributing to the incarceration of frequent, but low-level, offenders while contributing proportionally less to the incarceration of offenders most at risk for committing another violent or sexual offense.

Minnesota's Sentencing Guidelines and Criminal History Score

Minnesota formally adopted presumptive sentencing guidelines in 1980 to sentence all felony offenders. MSGC uses a standard sentencing grid, which takes into account both the severity of the felony offense (1 - 11 scale) and the offender's criminal history score (0-6 scale) to arrive at a recommended sentence (see Appendix A: Minnesota Sentencing Guidelines Grid).[3] At sentencing, offenders receive a certain number of criminal history points for prior felony or serious misdemeanor convictions, felony juvenile adjudications, and for committing a crime while on supervision (i.e. custody status point).[4] As offenders accumulate criminal history points and move across the grid, they receive longer recommended sentences – between 2 and 20 additional months per point increase – and in the middle and low end of the grid, this movement across the grid also results in movement across the dispositional line from recommended probation to incarceration. The average prison sentence recommended at CHS 6 is about 4.7 times the recommended prison or jail term at CHS 0; in practice, the average executed-custody sentence for offenders with a CHS of 6 is about 10 times that of offenders with a CHS of 0 (Frase and Hester 2015b, Table 2.3). In 2016, 68.4% of all felony offenders sentenced had a criminal history score greater than 0 and were thus subject to increases in sentence length and/or sentence disposition (i.e. moving from recommended probation to prison) due to criminal history (Minnesota Sentencing Guidelines Commission, 2017). Thus, the use of criminal history enhancements in the Minnesota Sentencing Guidelines has widespread implications for the state's community corrections and incarceration rates.

RESEARCH QUESTIONS

This study uses a cohort of all felony offenders sentenced in Minnesota in 2003 and who started probation or were released from prison or jail by December 31, 2012 (N=13,190). Recidivism is measured by a new felony conviction within three years of release or the start of probation (see Appendix B: Data and Methods for detailed information). This study has three main empirical questions:

1. What is the relationship between Minnesota's criminal history score and the rate of recidivism?
A major justification for use of the criminal history score in sentencing is to punish offenders who are more likely to recidivate; thus, each increase in the category of the score is associated with a longer, and sometimes more incarcerative, recommended sentence. Therefore, we would expect increases in the score to be associated with incremental and statistically significant increases in the rate of offender recidivism.

2. Does each component of the score (e.g. custody status point, juvenile adjudications) add to the score's predictive utility?
Each component of the score increases the total score and thus results in a higher incarceration rate and longer sentences for offenders in the Minnesota system. Thus, we would expect that each component of the score would also increase the score's ability to classify recidivists and non-recidivists.

3. What is the relationship between the criminal history score and reoffending type and severity?
Along with the overall likelihood of recidivism, policy makers and the public are also interested in the type of recidivism offenders are at risk for. Thus, it is important to differentiate between offenders who are dangerous (i.e. those most at risk for committing a serious or violent crime) and offenders who are simply at high-risk for reoffending. If the score is mainly targeting repeat low-level, non-violent offenders, it provides less public safety utility than a scoring system in which offenders at high risk for serious or violent crime are incapacitated through longer jail or prison sentences.

PART I Criminal History Score and Recidivism

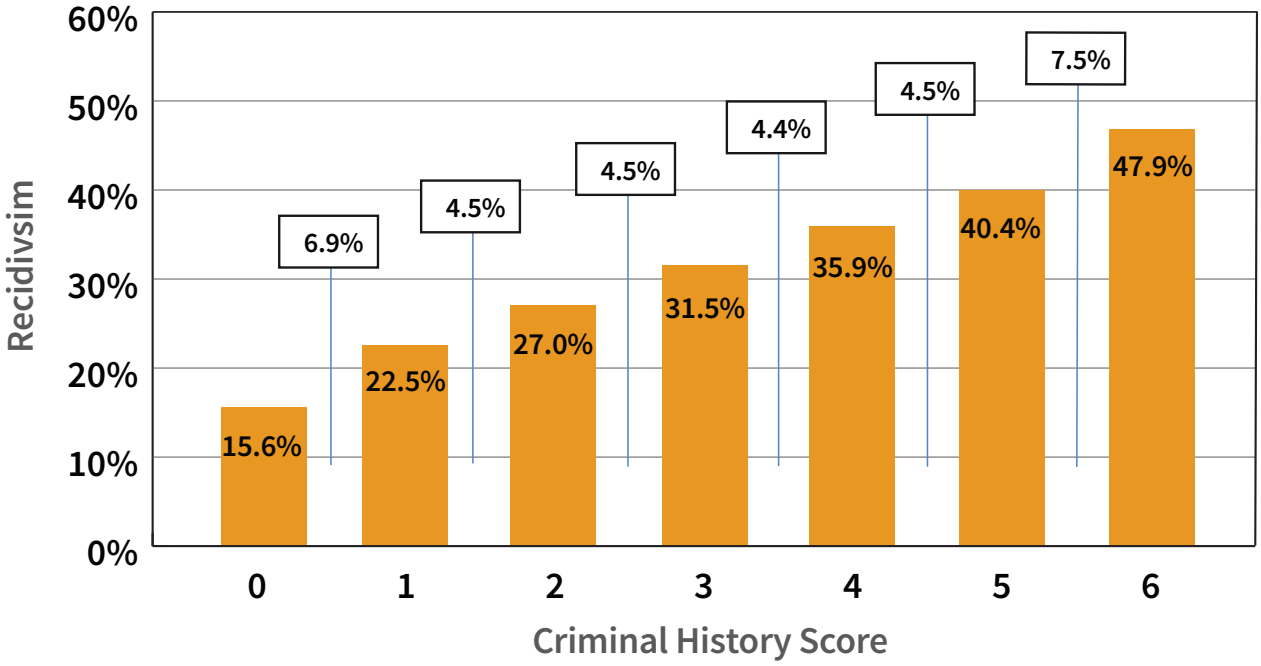
Rate of Recidivism by Criminal History Score

Figure 1 shows the rate of recidivism at each level of the criminal history score. The percentages in the call-out boxes represent the percentage-point differences in recidivism between the scores. The rate of recidivism varies across the criminal history categories and steadily increases as the score goes up. Offenders with a CHS 0 comprise almost half the sample (n=5,732) and recidivate at 15.6%. On the other end of the scale, almost half (47.9%) of those with a CHS 6 recidivate (n=633). The largest jumps in the rate of recidivism occur between offenders who have a score of zero and 1 (6.9 percentage-point increase), and offenders who have a score of 5 and 6 (7.5 percentage-point increase). Chi square testing shows that the rate of recidivism varies significantly between the criminal history categories, overall (Pearson chi2(6) = 687.67; $p < 0.001$).[5] However, the difference in the rate of recidivism between CHS 4 and 5 is not statistically significant and therefore could be due to chance ($p < 0.06$).

These findings have several policy implications. Offenders with CHS of 0 and 6 represent unique groups of offenders and exhibit a clear qualitative difference in their offending patterns. If the goal of sentencing enhancements is to exact greater punishment on more risky offenders, the greatest increases in the recommended sentence length should come from offenders moving from CHS 0 to CHS 1 and then again from offenders moving from CHS 5 to CHS 6. Similarity, it appears unnecessary to have seven criminal history categories. The practical difference in the rate of recidivism between levels 1 through 5 is fairly small (4.4 to 4.5 percentage points) and in one case — between CHS 4 and 5 — may be due to chance alone. In substantive terms, out of every hundred people who receive a CHS 3, 32 people will be reconvicted for a felony offense within 3 years of release. In contrast, out of every hundred people who receive a CHS 4, 36 people will be reconvicted. Despite this relatively small difference in the rate of reoffending, offenders who received a CHS of 4 are recommended for a sentence that is between 2 and 20 months longer than offenders receiving a CHS

Figure 1: Reconviction Rates by Criminal History Score

N=13,190



of 3 and are sometimes recommended for prison instead of probation. Reducing the number criminal history categories to reflect more substantive differences in recidivism risk could make it easier to justify recommended increases in sentence length and/or sentence disposition (i.e. moving from recommended probation to prison). Designating whether certain group differences in recidivism are big enough to deserve greater punishment (and how much greater punishment) is a question best left to individual commissions. However, at a minimum, the number of categories and the correlating cut-points in recidivism risk should not be arbitrary.

Disaggregating Criminal History Score Zero

Offenders with a criminal history score of zero include offenders who received half a point for a prior conviction of a low-severity offense, and those who have one or more prior misdemeanors or juvenile adjudications, but too few of these types of priors to earn a criminal history point. These offenders may be fundamentally different from "true zeroes" – or offenders who have no prior convictions or adjudications on their record. Disaggregating this category supports this assumption. Table 1 presents the recidivism rate for the disaggregated CHS 0 group. Out of the 5,732 offenders who received a criminal history score of zero, almost a third (n=1,732) had one low-level prior offense.

Table 1: Rate of Recidivism for Offender with Criminal History Score Zero

n=5,732 (offenders with a CHS 0)

Type of Offender	Rate of Recidivism
No prior offenses (n=4,000)	12%
Any prior offense (n=1,732)	24%

The difference in the rate of recidivism between these two groups is stark: first-time offenders reoffend at half the rate of repeat offenders with a CHS of zero (12% vs 24%, respectively). The 24% rate of recidivism for the repeat offender group is closer to the rate of recidivism for offenders with a criminal history score of 1 (22.5%). This suggests that having at least one prior conviction – even a low-level one – is associated with a significantly higher rate of recidivism compared to offenders with no prior convictions. It also suggests that offenders who have no prior convictions should be treated differently to their low rate of re-offending (12%). This finding provides support for policies that target first-time offenders, such as diversion or a first-time-offender discount at sentencing.

Disaggregating Criminal History Score Six

Offenders with a criminal history score of 6 (n=933) include more offenders who received scores of 7 or greater but were rounded down to CHS 6 (n=590) than offenders who received 6 raw criminal history points (n=343). This likely explains a slightly larger increase in the recidivism rate between CHS 5 and 6, compared to increases between CHS 1 through 5. Table 2 presents the recidivism rate for the disaggregated CHS 6 group. While offenders with a CHS 6 have a similar recidivism rate to those at CHS 5 (41%), over half (52%) of offenders who receive raw scores of 7 or above (but are rounded down to 6) recidivate. While they make up a small portion of the total sample, their recidivism rate falls significantly outside of the average rate of recidivism for the sample as whole (24%).

Table 2: Rate of Recidivism for Offender with Criminal History Score Six

n=933 (offenders with a CHS 6)

Type of Offender	Rate of Recidivism
CHS 6 (n=343)	41%
CHS 7 and above (n=590)	52%

Offenders with a criminal history score of 7 or above represent a small but particularly active group of offenders. This finding suggests that CHS 6 may not be the most effective "cap" to the criminal history scale and may need to be disaggregated to target offenders who are significantly higher risk than the average. However, this should be done cautiously and combined with a restructuring of lower criminal history categories (e.g. by combining criminal history categories 4, 5, and 6). Otherwise, simply raising the cap beyond CHS 6 would

further reduce the proportionality of recommended sentence to conviction offence severity, would disproportionately extend the sentences of property offenders (who make up the majority of high-CHS offenders), and would add further racially disparate impact (as high CHS offenders tend to be disproportionately Black and Native American).

Modeling the Effect of Criminal History on Recidivism

To explore the relationship between criminal history and recidivism, I used multivariate logistic regression to study the relationship between criminal history on recidivism while controlling for other predictive case and offender characteristics. This isolates the effect of criminal history on recidivism and allows for the examination of the effects of other independent variables on recidivism. Table 3 presents the logistic regression model. The 1.29 odds ratio for Criminal History Score means that each one-unit increase in the score is associated with a 29% increase in the odds of recidivating (p<.001), controlling for other offender demographics and case characteristics.[6] Another way to interpret these number is to calculate a marginal effects model (not shown) in order to show the predicted probability of recidivating at each level of the score, while controlling for the other variables in the model. This would show that for an otherwise average offender, someone with a CHS of 1 would have a probability of recidivating that is 7 percentage points higher than someone with CHS of 0, while someone with a CHS of 6 would have a probability of recidivating that is 31 percentage points higher than someone with CHS of 0. This relationship closely matches the increasing recidivism rate across criminal history categories in Figure 1.

Other independent variables also had a significant effect on the likelihood of recidivism. For example, offenders who are male or from a metro area were more likely to recidivate than female offenders or those from outside of Ramsey and Hennepin counties. Offenders who were racially White had 22% lower odds (p<.001) of recidivating than offenders who were non-White. Age at release and recidivism (discussed in more depth below) had an inverse relationship; each year an offender went up in age decreased his or her odds of recidivating by 2% (p<.001).

The severity of the conviction offense was inversely associated with recidivism – for each increase in the severity level, the odds of recidivism went down by 8% (p<.001). This means that more serious offenders had lower odds of recidivism than less serious offenders. Offenders who were incarcerated in prison had 48% higher odds of recidivating than offenders who received a sentence of probation (either with a jail term or without) (p<.001). Compared to property offenders, only offenders convicted of an offense in the Other category had a significantly lower rate of recidivism (*or*=0.84; p<.001), when other factors were controlled for.

Table 3: Logistic Regression Model of Criminal History and Recidivism (N=13,190)

	Odds Ratio	*SE*	
Criminal History Score	1.29	.014	***
Offender Demographics			
Male	1.37	0.09	***
White	0.78	0.04	***
Age at Release	0.98	0.00	***
Metro Area	1.1	0.05	*
Case Characteristics			
Offense Severity	0.92	0.01	***
Person Offense‡	0.9	0.06	
Drug Offense‡	1.05	0.06	
Other Offense‡	0.84	0.06	**
Incarcerated	1.48	0.12	***
Constant	0.3	.04	
-2 Log Likelihood	-6,835.06		
Pseudo R2	0.06		

* p < 0.05 ; ** p < 0.01 ; *** p < 0.001

‡ Property offense is the reference category.

A note on modeling recidivism outcomes: Using multivariate regression to model the effect of the criminal history score on recidivism provides two major advantages over examining the reconviction rate over the criminal history categories alone. First, it allows us to isolate the effect of the criminal history score on recidivism from other legal and extra-legal factors, such as age and disposition status. For example, the age of the offender at release and whether they were incarcerated has an effect on their likelihood of reoffending that is independent of the effect of the score alone.

However, simply looking at the increase in the recidivism rate across criminal history categories conflates these effects. Second, multiple regression allows us to examine the relative effects of all independent factors. For example, it might be important to know that the effect of an incarceration sentence has a significantly stronger effect on the likelihood of recidivism than the effect of the conviction offense type. Or that increases in offense severity decrease the likelihood of recidivism. Please note that there may be many other variables that affect the likelihood of recidivism (e.g. employment status) that are not included because of data limitations. Both ways of presenting the relationship between criminal history score and recidivism are important and allows us to generalize these processes to Minnesota offender cohorts outside of the current sample.

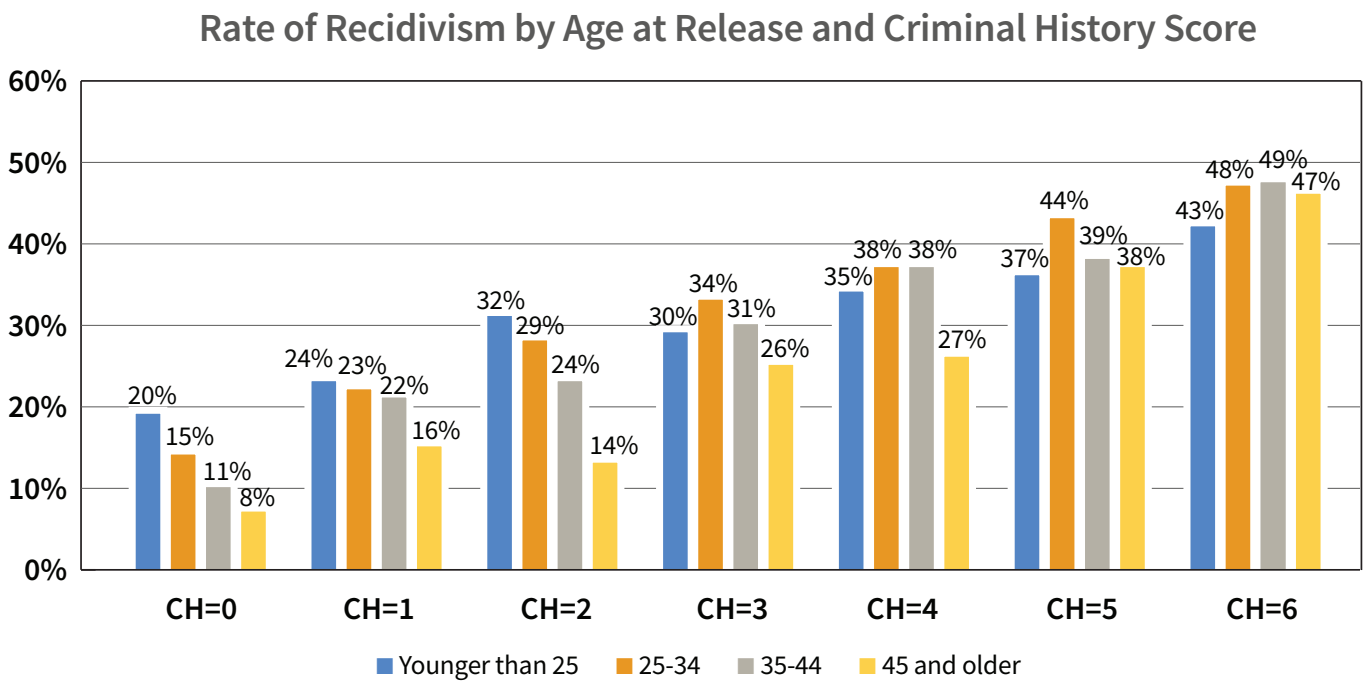
Age and Re-Offending

Research shows that one of the strongest and most consistent predictors of criminal involvement is age. The age-crime curve — a bell-shaped curve showing an increase in the prevalence of offending in late childhood and then a decline in the early 20's — is near universal in Western populations (Farrington, 1986). Thus, we would predict that the likelihood of reoffending should be inversely associated with age for justice-system involved adults. The model in Table 3 supports this: age at release has a strong relationship to reoffending – with the odds of recidivating decreasing 2% for each year increase in offender age, controlling for criminal history. This means that two offenders who have the same criminal history, offense characteristics, and demographics will differ on their risk of recidivism based on age alone. To explore this relationship in more nuance, Figure 2 shows the rate of recidivism by offender age at release over the criminal history categories.[7]

Figure 2 showed that for about 75% of the sample (i.e. criminal history categories 0-2), older offender groups recidivated at a lower rate than younger offender groups. However, at the higher criminal history categories, this relationship became more complicated. At CHS 3, the rate of recidivism for the second oldest offender group (35-44) almost matched that of the youngest offender group (15-24), and at CHS 5 the rate of recidivism for the oldest offender group (45+) almost matched that of the youngest offender group. Furthermore, in a complete reversal from the lower end of the criminal history score scale, it was the youngest offender group that had the lowest recidivism rate at CHS

Figure 2: Rate of Recidivism by Age at Release and Criminal History Score

N=13,190



5 and 6. One explanation for this is that the age-crime curve explains the behavior of the general population better than the select group of high-frequency offenders found at CHS level 3 through 6.[8] These criminal history score levels may have a disproportionate number of offenders who could be described as "career criminals" (Piquero et al., 2003) or "life-course persistent" offenders (Moffitt, 1993) and who may not decline their offending frequency with age. Older offenders at high criminal history levels tend to be disproportionately property offenders, both in their conviction offense and recidivism type. In sum, the effect of age on recidivism appears to interact with the criminal history score and encoding its consideration into policy would require a nuanced and localized approach.

Predictive Validity of the Criminal History Score

To examine how well the criminal history score predicts recidivism, an AUC statistic is calculated (0.64). A statistic of 1 would mean the score was 100% predictive of recidivism and a statistic of 0.5 would mean it was no better than chance at identifying recidivists from non-recidivists. A 0.64 AUC statistic translates to a medium effect size in statistical terms (Rice & Harris, 2005) and is moderately predictive in practical terms. Another way of putting it is that if we were to pick a random recidivist and a random non-recidivist from the study sample, the non-recidivist would have a lower criminal history score 64% of the time. For comparison, a meta-analysis by Yang and colleagues (2010) found that the AUC values across nine validated violence prediction instruments in circulation ranged from 0.56 and 0.71.

1 Scholars contest enhanced culpability as a rationale for high-magnitude prior record enhancements (see Hester,

2 It is unclear whether the differences between each category were statistically significant; however, they showed a clear upward trend.

3 Minnesota adopted a Sex Offender Sentencing Grid in 2006 and a Drug Offender Grid in 2016 – however the sample for this project was sentenced prior to the adoption of either secondary grid.

4 For a more detailed explanation of the calculation rules for Minnesota's criminal history score, please visit https://mn.gov/sentencing-guidelines/assistance/criminal-history-calculation/

5 Supplemental survival analysis shows that recidivism differences between the scores remain up to 10 years out, however they slightly narrow over time.

6 When the odds ratio is greater than 1, it represents a positive relationship between the independent variable (e.g. criminal history score) and the odds of recidivism; when the odds ratio is less than 1, this indicates a negative relationship. To determine the effect size, calculate the difference between the odds ratio and 1 (e.g., 1.29 minus 1=+29%; 1 minus 0.78 = -22%).

7 Age groups were chosen to reflect Minnesota sentencing policy (e.g., different CHS counting rules are applied to offenders under age 25), to minimize sample size differences between age groups, and for convenience.

8 It should be noted that the Pennsylvania prior record score analysis (Hester 2017) and the Federal criminal history score analysis (U.S. Sentencing Commission, 2017) shows contrary results (i.e. a steadily declining rate of recidivism for older offender groups across the criminal history scale). These differences may be due to different population parameters, age group cut points, or differences in the outcome variable. It is also likely that the structure of Minnesota's criminal history score does a better job of isolating life-long persistent offenders (and property offenders) at the higher ends of the scale.

PART II Alternative Formulations of the Score

There is wide variation in the criminal history components that jurisdictions count in criminal history formulas and in the weights they assign to each component. Changing these formulations can have a significant effect on the number of people who receive longer sentences and the number of people who are incarcerated instead of being given probation. Ideally, each component of the score is not only independently associated with recidivism, but also provides additional power to the score's predictive utility. Removing unnecessary or low-performing components of the score (or accurately re-weighting included components) can move offenders into lower criminal history categories without substantially affecting the predictive validity of the score. This makes the score more efficient because it removes components of the score that lead to longer recommended sentenced for offenders who are not higher risk. Below, I test out four variations of the score and compare their AUC statistics with the original score formulation.

Custody Status

Minnesota's criminal history scoring formula assigns a custody status point to offenders who commit a new offense while on some form of supervision (e.g. probation, supervised release). This is meant to provide additional punishment to offenders who commit a new offense while still serving out their old sentence. For a variety of reasons, including Minnesota's comparatively long probation terms, a large portion (33.5%) of 2003 offenders received a custody status point as part of their score. However, almost a third of the sample (30.3%) were not eligible for a custody status point because they had no prior convictions. Table 4 shows the recidivism rate between offenders who received a custody status point and those who have not, excluding offenders who were not eligible for the point (i.e. true first-time offenders). The rate of recidivism for offenders who have a custody status point is about 7 percentage points higher, and this difference is statistically significant (p<.001).

Table 4: Rate of Recidivism for Custody Status Point

n=9,190 (excludes true first-time offenders)

Type of Offender	Rate of Recidivism
No Custody Status Point (n=4,767)	26%
Custody Status Point (n=4,423)	33%

However, a comparison of means does not take into account the effect of other covariates, such as age or offense type. For example, if offenders who receive a custody status point are significantly more likely to be young, male, or have a property offense, the difference in the rate of recidivism shown in Table 4 may be due to those factors rather than the custody status point. To explore this, I ran a multivariable logistic regression model of custody status and recidivism, controlling for relevant case and offender characteristics for offenders eligible for a custody status point. Table 5 presents the results of the model. Offenders who have a custody status point have 26% higher odds of recidivating than offenders without a custody status point, controlling for the effect of the criminal history score, demographics, and other case characteristics.

Table 5: Logistic Regression Model of Custody Status and Recidivism

n=9,190 (excludes true first-time offenders)

	Odds Ratio	*SE*	
Custody Status Point	1.26	0.06	***
Criminal History Score[10]	1.19	0.02	***
Offender Demographics			
Male	1.3	0.10	***
White	0.78	0.04	***
Age at Release	0.99	0.00	***
Metro Area	1.16	0.06	**
Case Characteristics			
Severity	0.91	0.01	***
Person Offense‡	0.91	0.06	
Drug Offense‡	0.95	0.06	
Misc. Offense‡	0.81	0.06	**
Incarcerated	1.43	0.14	***
Constant	0.38	.06	
-2 Log Likelihood	-5,322.7		
Pseudo R2	0.04		

* p < 0.05 ; ** p < 0.01 ; *** p < 0.001

‡ Property offense serves as the reference category.

Table 6 presents the predicted probability of recidivism at each level of custody status based on the model in Table 5 (unlike Table 4, Table 6 controls for the other predictor variables in the model above). Looking at offenders who are eligible for the custody status point, the predicted probability of recidivism for offenders who have the point is about 5 percentage points higher than those who do not have the point (p<=.001). In sum, offenders who received a custody status point are predicted to recidivate at slightly higher rates than offenders who did not receive the point, keeping the effects of offender demographics and case characteristics at their average levels.

Table 6: Predicted Probability of Recidivism for Custody Status Point Status

n=9,190 (excludes true first-time offenders)

Type of Offender	Predicted Probability of Recidivism
No Custody Status Point (n=4,767)	26%
Custody Status Point (n=4,423)	31%

I reformulated the original criminal history score formula by excluding the custody status factor entirely. This resulted in 4,013 (30%) of offenders moving into a lower criminal history category.[11] Further analysis shows that removing this component from the score would yield reductions in the racially disparate impact of the score. A large portion (43%) of the 4,013 offenders who would move into a lower criminal history category if the custody status point was not counted in 2003 are non-White, which is significantly larger than the percentage of non-White offenders in the sample as a whole (39%). The AUC statistic for the reformulated score was 0.63, which reduced the power of the score to predict recidivism by 1% (p<.001). Thus, although custody status is predictive of recidivism, retaining it in the score's formulation only helps identify an additional 1 out of 100 recidivists.

Juvenile Adjudications

Up to two points can be added to an offender's score for juvenile adjudications, and only adjudications for offenses that would have been felonies if committed by an adult are counted. This is meant to identify young adult felons whose criminal careers were preceded by felony-type offenses committed as a juvenile (Minn. Sentencing Guidelines § 2.B.401). Only a small portion of the 2003 sample (5%) received any juvenile adjudication points. Table 7 shows the difference in the recidivism rates between offenders who received any points for juvenile adjudications and those who did not. Only offenders who are under the age of 25 at the time of the conviction offense are eligible to receive points for juvenile adjudications, thus this comparison is limited to eligible offenders. Offenders who had a juvenile point or points were actually less likely to recidivate than those who did not (19% vs 25%) (p<=0.001). It is not entirely clear why this is the case.

Table 7: Rate of Recidivism for Juvenile Point Status

n=5,153 (excludes offenders 25 and over at the time of conviction offense)

Type of Offender	Rate of Recidivism
Juvenile Point(s) (n=701)	19%
No Juvenile Point (n=4,452)	25%

Reformulating the original score without counting juvenile adjudication would have moved 668 (5%) offenders from the 2003 sample into a lower criminal history score category. A significant portion of offenders (42%) that would have moved into a lower criminal history category are non-White, which is a higher proportion of non-White offenders in the sample as whole (39%). Not counting juvenile adjudications would have no significant effect on the predictive power of the score (AUC 0.64).

Misdemeanor Convictions

For every four gross misdemeanor or serious misdemeanor convictions, offenders receive 1 point on the criminal history score (eligible offense list provided in Minn. Stat. § 299C.10, subd. 1(e)). With the exception of felony DWIs, offenders may not receive more than 1 point for misdemeanors on their record.

In 2003, 1,087 (8%) of offenders received at least one misdemeanor point. Table 8 shows the difference in the recidivism rate for offenders who received any number of points for misdemeanor convictions and those who did not. Offenders who received misdemeanor points were almost twice as likely to recidivate than offenders who did not (43% vs 22%, respectively).

Table 8: Rate of Recidivism for Misdemeanor Points

N=13,190

Type of Offender	Rate of Recidivism
No Misdemeanor Point(s) (n=12,103)	22%
Misdemeanor Point(s) (n=1,087)	43%

Reformulating the original criminal history score without counting misdemeanors would move 934 (7%) of offenders into a lower criminal history category. A full 50% of offenders who would move into a lower criminal history category if misdemeanor offenses were not counted are non-White, which is substantially higher than the percentage of non-white offenders in the sample as whole (39%). However, this change would also reduce the power of the score to predict recidivism by 1% (AUC 0.63; p<.001).

Felony Weighting

Another way to change the formulation of the score is to simplify it by counting only the most predictive component of the score: felony convictions. For 2003 offenders, felony convictions are given half a point to 2 points depending on the severity of the offense. However, if we re-scored the 2003 sample without weighting felonies (i.e. by adding 1 point for every felony offense regardless of the seriousness), and excluded the custody status, juvenile adjudication, and misdemeanor points, 3,350 (25%) of offenders would move into a lower criminal history score category, while 1,469 (11%) would move into a higher criminal history category. This change would reduce the racially disparate impact of the score because a significant portion (45%) of offenders moving into the lower criminal history category would be non-White, which is a higher proportion of offenders than the sample as a whole (39%). Similarly, 36% of offenders moving into a higher criminal history category would be non-White, which is slightly lower than the proportion of non-White offenders in the sample. The new formulation, which looks only at felony convictions and scores them all at one point each, has the same the predictive power of the current criminal history score (AUC .64).

This change would come with a major implication though: it would send more property offenders to prison, and for longer, because a disproportionate number of half-point felonies are for property offenses. In 1989 when the Commission lowered low-severity felonies to half a point, the goal was to reserve finite prison resources for violent offenders and restore sentencing proportionality for property and nonviolent offenders (MSGC, 1989). Thus, while simplification of the score may be desirable, it may conflict with other goals of the score.[12]

[9] Without controls.

[10] Since the goal is to isolate the effect of the custody status point on recidivism controlling for the effect of other criminal history points, the criminal history score was re-calculated to subtract a point for anyone who received a custody status point.

[11] Not everyone who received a custody status point automatically moved into a lower criminal history category once I reformulated the score because some offenders who received more than 6 raw criminal history points stayed in CHS 6. (This was also true for the other reformulations.) It should be noted that offenders with a criminal history score of 7 and above are subject to a special Guidelines rule, which adds 3 months to their recommended prison term if they receive a custody status point.

[12] One way to retain this goal, and slightly simplify the score, would be to exclude felony up-weighting while keeping all other score components (e.g. juvenile adjudications, misdemeanors, custody status, and down-weighting). The existing dataset does not allow for an exact calculation of this option. However, preliminary analysis shows that eliminating some felony up-weighting would have no effect on the predictive power of the score (0.64 AUC), and would move 484 (4%) offenders into a lower criminal history category.

PART III Case and Offender Characteristics and Recidivism

Conviction Offense Type and Recidivism

Literature has shown that criminal history has a strong and positive relationship with future reoffending. Other factors such as offender demographics or offending patterns can also increase or decrease the likelihood of recidivism for offenders. The conviction offense (i.e. the 2003 instant offense) can provide information about the likelihood of recidivism, as well as the likelihood of reoffending within the same offense category. For example, research shows that property offenders tend to have higher rates of recidivism, compared violent offenders (Alper and Durose, 2018). Minnesota's 2003 sample of offenders shows that property offenders recidivate at slightly higher rates (26%) than person offenders (21%). Property offenders also have a significantly higher average criminal history score than other types of offenders (1.7 vs 1.5, respectively; $p<0.001$), which would help explain their higher rate of recidivism. Table 9 shows the recidivism rate by conviction offense type (N=13,190).

Table 9: Percent Recidivating at Each Offense Type

N=13,190

2003 Conviction Offense	Percent Recidivating
Property	26%
Person	21%
Drug	25%
Other	22%

Offense Specialization for Recidivists

Conviction offense type is also predictive of the recidivism offense type. Offenders are significantly more likely to recidivate within the same offense type as their original conviction. Table 10 shows the percentage of 2003 recidivists who are reconvicted for the same type of offense as their 2003 conviction (n=3,123). The percentages in bold show that across all four categories of offense types, offenders are substantially more likely to recidivate within the same offense type. For example, over half (56%) of all property recidivists reoffended with another property offense – and only 13% do so with a new person offense. Similarly, recidivists who were convicted of a person offense in 2003 were substantially more likely to recidivate with a new person offense (42%) compared to any other type of offense.[13]

Table 10: Offense Specialization by Offense Type

n=3,123 (Recidivists only)

Conviction Offense Type	Recidivism Offense Type				
	Person	Property	Drug	Other	Total
Person	**42%**	19%	20%	19%	(611) 100%
Property	13%	**56%**	20%	11%	(1,233) 100%
Drug	12%	20%	**56%**	12%	(854) 100%
Other	16%	18%	20%	**45%**	(425) 100%
Total Portion of Recidivist	(593) 19%	(1,057) 34%	(928) 30%	(545) 17%	(3,123) 100%

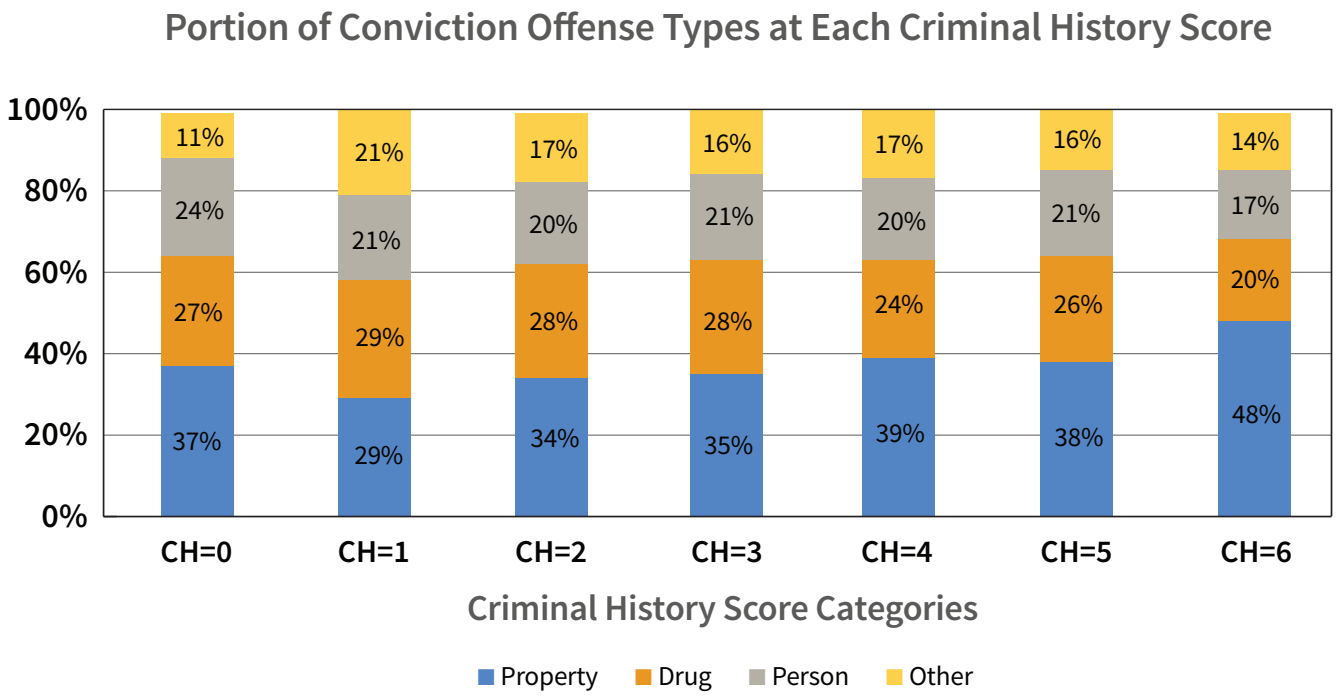
Offender Types, Reconviction Type, and Reconviction Rates Across Criminal History Score Levels

Figure 4 shows that as the criminal history score goes up, property offenders – or offenders who received a property conviction in 2003 - begin to make up a larger portion of the total group of offenders. At CHS 0, they make up 37% of all offenders, however at CHS 6 – the level that receives the largest criminal history enhancement - they make up almost half of all offenders (48%). Both drug and person offenders make up a smaller portion of the total offender pool at the higher ends of the scale, compared to the lower levels. For example, at CHS 0, person offenders make up a quarter (24%) of all offenders, but at CHS 6, they make up 17% of all offenders. This means that the highest criminal history category – and thus the largest criminal history enhancements –are overwhelmingly used to target property offenders – as compared to person, drug, or other offenders.

Person offenses – or offense that are violent or sexual in nature – tend to elicit the most concern from policy makers and the public at large. Thus, the recidivism rate alone offers an incomplete picture of public safety, as a high rate of property or drug recidivism is qualitatively different than a high rate of person recidivism. One way to examine who the score is targeting at the highest levels is to look at the most common reconviction offense type across the levels of the score. Figure 5 shows that as the criminal history score goes up, the proportion of property recidivism goes up as well, so that at the top end of the scale (CHS 6) about half (23% of 48%) of all the recidivism is for a property offense. This means that within the group receiving the largest criminal history enhancements (i.e. CHS 6), the property offense recidivism rate dwarfs the person, drug, or other offense recidivism rates. The opposite occurs with drugs recidivists: as criminal history goes up, drug offenses make up a lower percentage of all recidivism events. At CHS 0 a third (5% of 15%) of all the recidivism events are for a drug offense, but at CHS 6 a fifth of all recidivists (9% of 48%) reoffends with a drug

Figure 4: Offender Types by Criminal History Score[14]

N=13,190



offense. The portion of offenders recidivating with person offenses and other offenses stay relatively stable as the score goes up. The likelihood of recidivating with a person offense does not vary significantly at the higher ends of the scale: offenders were almost as likely to recidivate with a person offense whether they had a criminal history score of 3 (7%) or a score of 6 (8%).

Overall, property offenders have a 15% chance of recidivating with another property offense within 3 years of release, compared to 4% for other types of offenders. Similarly, offenders who were convicted of a person offense in 2003 have a 9% chance of recidivating with another person offense within 3 years of release, compared to a 3% chance for other types of offenders. Drug and other offenders' recidivism rates fall between property and person offenders, but they are still much more likely to recidivate within the same offense type. Given these differences in risk it is appropriate to ask whether the consideration of conviction offense type should be encoded into the sentencing process, or even the criminal history score formula.

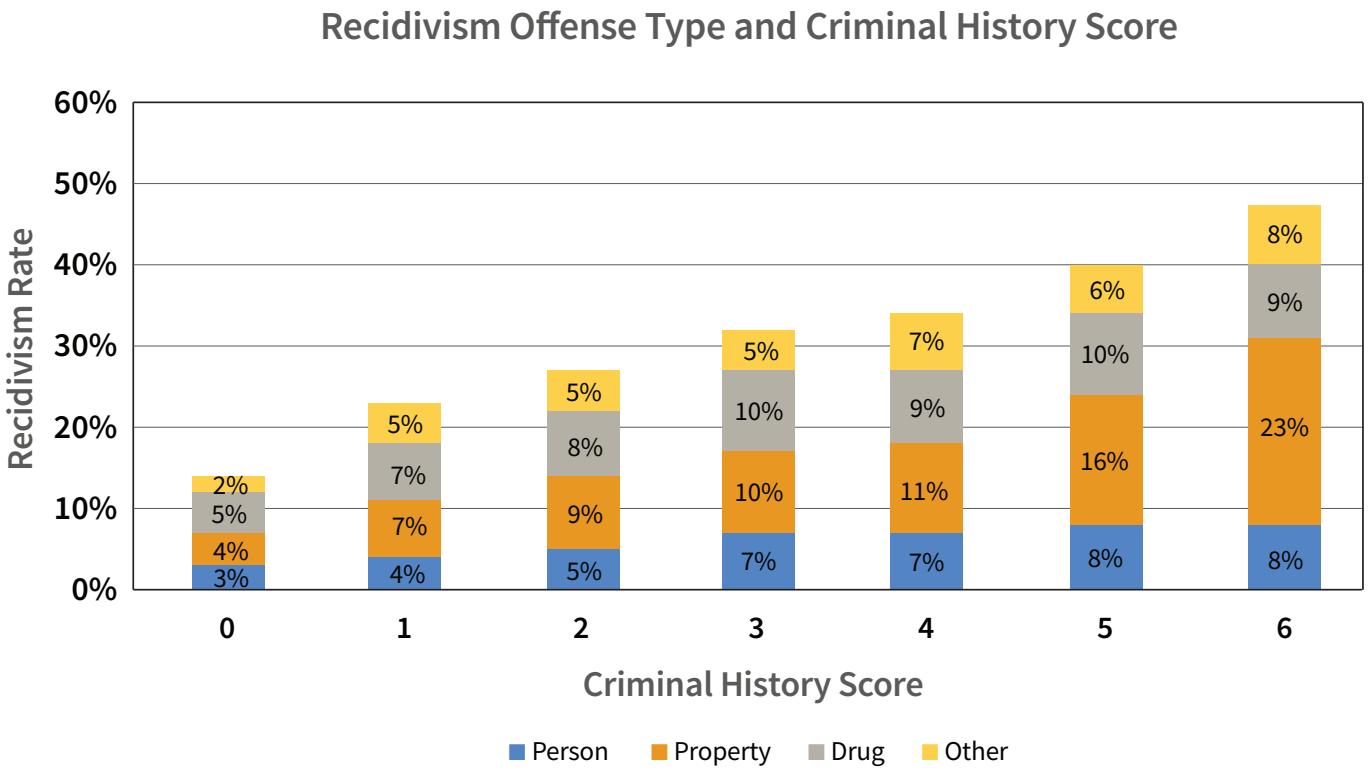
Severe Violent Offenders and Recidivism Outcomes

MSGC has designated the most serious violent offenses under a Severe Violent Crimes (SVC) category. Offenders who commit any of the felonies on the SVC list (e.g. 1st degree arson, 1st degree robbery), receive 1.5-2 criminal history points per felony. In 2018, the Commission began debating a proposal to increase the score of any prior SVCs to 3 points, if the current conviction offense is also an SVC. This was proposed in order to target serious violent recidivists for the longest prison sentences.

Offenders convicted of an SVC in 2003 made up a small percentage (5%) of the sample and had general recidivism rates that were slightly lower than the rest of the sample (22% vs 24%, respectively). Table 11 shows that very few (2%) severe violent offenders recidivated with another SVC within a three-year period after release –almost the same as non-SVC offenders (1%). This difference was small, but statistically significant (p<.01). However, SVC offenders were slightly more

Figure 5: Reconviction Rates by Recidivism Offense Type and Criminal History Score[15]

N=13,190



likely to recidivate with another person offense than the rest of the sample (7% vs 4%, respectively) during that time period. These findings are consistent with other results of the report, showing that both offense severity ranking and person-offense classification are negatively correlated with general recidivism risk (i.e., as the severity of the conviction offense increases, the likelihood of recidivism decreases), and that recidivists tend to specialize in their reoffending.

Table 11: Severe Violent Recidivism Rate by Severe Violent Crime Status

N=13,190

Type of Offender	Rate of Severe Violent Crime Recidivism
Non-Severe Violent Crime (n=12,583)	1%
Severe Violent Crime (n=607)	2%

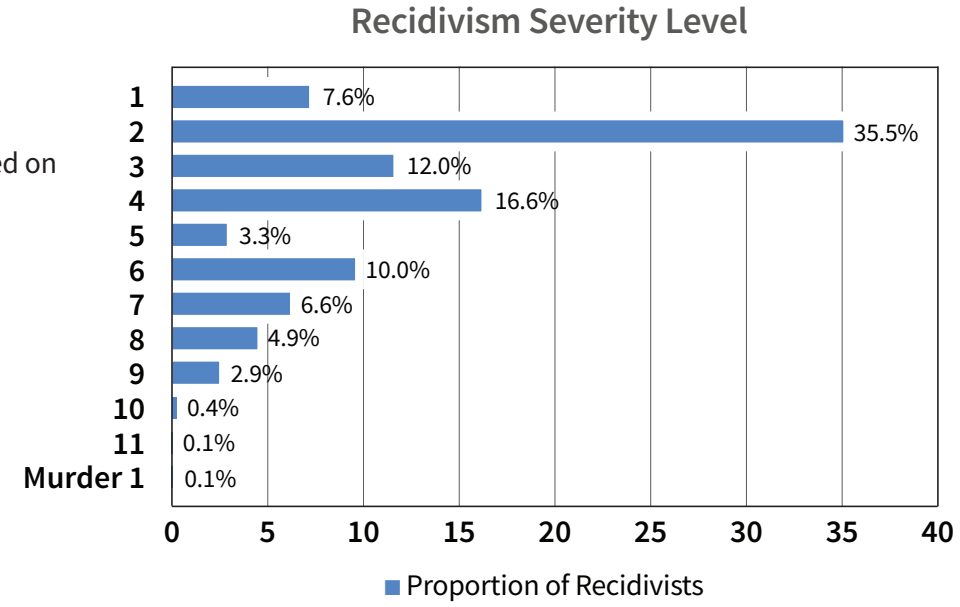
In theory, the design of the criminal history score could be altered to impose greater punishment on violent or serious offenders. Minnesota's score allows for any offender type to move to the top levels of the criminal history score based largely on the frequency of prior offenses. Because property offenders tend to be frequent offenders, they inevitably take up a larger portion of the top criminal history categories. One possible solution would be to cap the number of points an offender can receive for low-level, property, or drug offenses. This would keep frequent low-level offenders at the lower ends of each severity level on the grid, but allow offenders with a prior violent or sex offense to move to the upper end of the grid. For example, Kansas uses a category based criminal history score that serves much the same purpose.[16] By excluding offenders without prior person felonies from the highest categories, and confining offenders who only have prior misdemeanors in the two lowest categories, Kansas's scoring design assigns the greatest sentencing enhancements to offenders most at risk for a serious or violent offense. While empirical evaluations have not been conducted, this design likely gives up some predictive power in identifying offenders most at risk for any type of re-offense.

Criminal History and Recidivism Severity Level

Along with recidivism rate and recidivism offense type, policy makers are also concerned with the seriousness of the recidivism event. Low-level offenses — or those falling in lower severity levels of the scale — tend to elicit less concern than those falling at the high ends of the scale. Figure 6 shows that out of the offenders who recidivated and were sentenced on the main sentencing grid (n=3,086),[17] over a third (35.5%) did so at severity level 2. Severity level 2 is overwhelmingly made up of property and drug offenses (e.g. theft $5,000 or less, check forgery $251-$2,500, 5th degree controlled substance). Overall, three-fourths (75%) of all recidivists reoffend within the lower half of the severity level grid (levels 1-5). The distribution of the recidivism severity level closely matches that of the distribution of the severity level for all conviction offenses (i.e. including first-time offenders) in that the overwhelming majority of conviction offenses are at severity level 5 or below. This suggests offenders who recidivate do not commit more serious offenses than first offenders.

Figure 6: Severity Level of Recidivism Offense

n=3,086 (Recidivists sentenced on the main grid only)

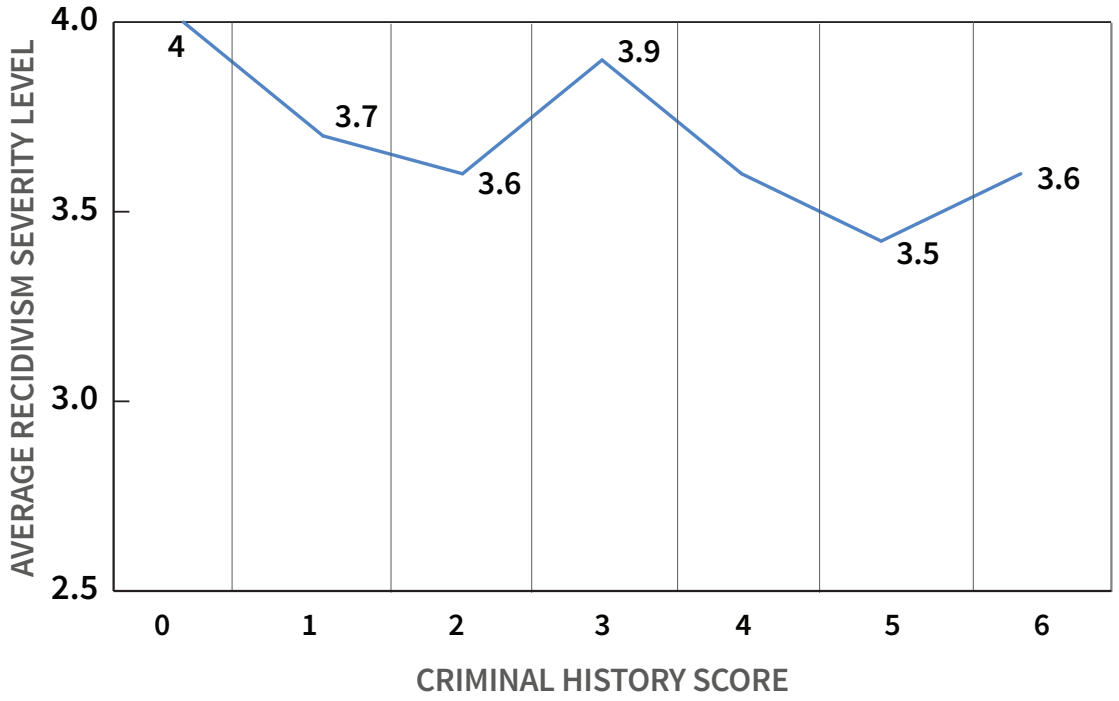


In Part I (Table 3), we saw that severity of the conviction offense was inversely related to reoffending – meaning that more serious offenders were less likely to recidivate, controlling for relevant case and offender characteristics. Here we examine the effect of criminal history on the recidivism severity level. Some research shows that offenders tend to progress in the severity of their offending over the course of their criminal career (MacDonald et al., 2014). Thus, there might be a concern, and even an assumption, that offenders with lengthier criminal history records (i.e. those with higher criminal history scores) would reoffend with more serious offenses than those with lower criminal history scores. Using only offenders who recidivated and were sentenced on the main sentencing grid (n=3,086), I ran an OLS regression looking at the effect of criminal history score on the recidivism severity level, controlling for relevant case and offender characteristics (see Table 3 for complete list of covariates). Figure 7 shows the mean predicted value of the recidivism severity level at each level of the criminal history score, controlling for the natural variation in demographics and case characteristics in the sample. The predicted recidivism severity level goes down as the criminal history score goes up. For example, when an offender with CHS of 0 recidivates, the average severity level of the recidivism offense is 4. When an offender with a CHS of 6 recidivates the predicted severity level of the recidivism offense is slightly lower (3.6).

In sum, recidivists with higher criminal history scores tend to reoffend with slightly less severe offenses than recidivists with lower criminal history scores. This means that the greatest criminal history enhancement affects offenders who re-offend with slightly less serious crimes than offenders receiving smaller enhancements. One way to target offenders who are more likely to recidivate with a serious offense would be to cap the number of criminal history points an offender could get for past low-severity offenses.

Figure 7: Predicted Recidivism Severity Level by Criminal History Score

n=3,086 (Recidivists sentenced on the main grid only)



CONCLUSION

This project evaluates the effectiveness of Minnesota's criminal history score as an unofficial proxy for recidivism risk. The score is moderately predictive of recidivism, but it has components that increase recommended sentences while adding no or minimal predictive power: custody status, juvenile adjudications, misdemeanors, and felony weighting. The scoring formula could be modified to exclude low-performing factors while reducing the size and cost of Minnesota's prison population. Findings also show that Minnesota's criminal history score imposes the greatest sentencing enhancements on offenders who are convicted of property offenses, because these tend to be the most frequent offenders. It also imposes the greatest sentencing enhancements on offenders who are most likely to recidivate with a property offense. The score's design targets frequent, low-level offenders, but it does worse at targeting offenders most at risk for another serious or a person offense. The score has historically been justified on both utilitarian and retributive grounds. Thus, the Commission may justify parts of this design simply because they view certain offenders as more culpable and deserving of extra punishment. However, these findings show that the design of the score is less justifiable on public safety grounds in that it does not reserve the highest enhancements for offenders most likely to commit another person or serious crime.

This research assists the MSGC in making decisions about the size and severity of the criminal history enhancements based on the empirical differences in risk. However, it is for MSGC to decide whether the benefits of keeping certain components of the score for retributive purposes outweigh the benefits of taking them out. Similarly, it is beyond the scope of this study to determine how much, if any, extra punishment will result in the best outcome for offenders who are at higher risk for re-offending, or whether they are truly deserving of more punishment on retributive grounds (see Hester et al., 2017; Roberts and von Hirsch 2010 for further discussion).

One final aspect to consider is whether, and to what extent, the use of criminal history to target repeat offenders for the most severe sentences is effective at promoting public safety. Theoretically, prior record enhancements can promote public safety in two ways: first, by incapacitating frequent offenders — physically separating them from the community; and second, by deterring – through fear of punishment — these and other would-be offenders from committing crime. However, research raises serious questions about the incapacitation and deterrence effects of enhanced penalties (for recent reviews of this voluminous research, see Hester et al., 2018 and Travis et al., 2014). The crime-prevention benefits of incapacitative sentences are easy to overstate (Piquero and Blumstein, 2007). For starters, the average U.S. offender serves just 16 months in prison and two-thirds are re-arrested for a new crime within three years of release (Bonczar et al., 2011; Durose et al., 2014). Moreover, the linear nature of criminal history enhancements is at odds with life-course offending patterns, which results in targeting older offenders who have had more time to accumulate points but who may be at or nearing the end of their criminal careers. Finally, locking up certain types of offenders, such as drug dealers, does little to decrease the community crime rate as incarcerated offenders are replaced by other criminal actors (Blumstein, 1993).

Similarly, for prior record enhancement to have a general deterrent effect, most would-be offenders must be aware that such enhancements exist and refrain from committing an offense due to the additional sentence time they would receive *above and beyond* what they would receive due to the severity of their offense alone. However, research has failed to show that offenders have crime specific impressions of sanction risk and shape their behavior accordingly (Von Hirsch et al., 1999; Williams et al., 1980), but does show that the certainty of punishment has a greater effect than the severity of the sanction on the likelihood of committing a crime (Nagin and Pogarsky, 2011). Thus, it is

unlikely that the existence of a sentencing enhancement policy or the inclusion of a specific criminal history score component would have a deterrent effect on offender behavior over and above the (possible) deterrent effect of being sentenced based on the severity of the crime alone.

Furthermore, as to both incapacitation and deterrence of the punished offender, research shows that prison (compared to less intensive punishment) and prison term duration, have either no effect or a crime-increasing effect on post-release offender behavior (Cochran, Mears, and Bales, 2014; Mitchell et al., 2016; Nagin and Snodgrass, 2013). The research summarized above does not mean that prior record sentence enhancements have no crime-preventive benefits, but sentencing commissions should be aware that such benefits are often quite modest and come with considerable fiscal and social costs. Thus, there are compelling arguments for maximizing the accuracy and equity of criminal history scores.

Overall, this project challenges the ubiquitous use of criminal history in sentencing decisions and instead asks if the score is being used in line with its purpose. The answer to this question has implications not only for the sentencing field, but also the broader field of criminal justice - which relies heavily on the use of criminal history to inform decision-making. Since the social and monetary costs of sentencing enhancements are so great, sentencing commissions and other government agencies are encouraged to explicitly outline the purpose of their criminal history enhancement and to perform similar analyses on their criminal history scores.

[13] It should be noted that while person offenses are considered more serious than other types of offenses, about half of the offenders who are convicted of a person offense are convicted at severity level 4 and below (e.g. 3rd degree assault, soliciting minors). This pattern is also true for the severity of recidivism for person offenses.

[14] The bar areas have been equalized to highlight differences in proportions. The total N for each criminal history category is not equal.

[15] Bar chart is reshaped to highlight difference in recidivism proportions. It does not represent the total N for each criminal history category.

[16] See Kansas's Sentencing Guidelines Grid at https://sentencing.ks.gov/docs/default-source/2017-forms/2017-nondrug-and-drug-grid-quick-reference-guide.pdf. Oregon uses a similar design: https://www.oregon.gov/cjc/about/Documents/guidelinesgrid.pdf.

[17] In 2006, the MSGC adopted a separate sex offender grid to sentence sex offenses. The severity levels of the sex offense grid do not match up to the severity levels of the main grid, and so recidivists who were sentenced on the sex offender grid were excluded from this analysis(N=37).

APPENDICES

Appendix A: Minnesota Sentencing Guidelines Grid (2003)

IV. SENTENCING GUIDELINES GRID

Presumptive Sentence Lengths in Months

Italicized numbers within the grid denote the range within which a judge may sentence without the sentence being deemed a departure. Offenders with nonimprisonment felony sentences are subject to jail time according to law.

SEVERITY LEVEL OF CONVICTION OFFENSE (Common offenses listed in italics)		CRIMINAL HISTORY SCORE						
		0	1	2	3	4	5	6 or more
Murder, 2nd Degree (intentional murder; drive-by-shootings)	XI	306 *299-313*	326 *319-333*	346 *339-353*	366 *359-373*	386 *379-393*	406 *399-413*	426 *419-433*
Murder, 3rd Degree *Murder, 2nd Degree (unintentional murder)*	X	150 *144-156*	165 *159-171*	180 *174-186*	195 *189-201*	210 *204-216*	225 *219-231*	240 *234-246*
Criminal Sexual Conduct, 1st Degree [2] *Assault, 1st Degree*	IX	86 *81-91*	98 *93-103*	110 *105-115*	122 *117-127*	134 *129-139*	146 *141-151*	158 *153-163*
Aggravated Robbery 1st Degree *Criminal Sexual Conduct, 2nd Degree (c),(d),(e),(f),(h)* [2]	VIII	48 *44-52*	58 *54-62*	68 *64-72*	78 *74-82*	88 *84-92*	98 *94-102*	108 *104-112*
Felony DWI	VII	36	42	48	54 51-57	60 57-63	66 63-69	72 69-75
Criminal Sexual Conduct, 2nd Degree (a) & (b)	VI	21	27	33	39 *37-41*	45 *43-47*	51 *49-53*	57 *55-59*
Residential Burglary *Simple Robbery*	V	18	23	28	33 *31-35*	38 *36-40*	43 *41-45*	48 *46-50*
Nonresidential Burglary	IV	12[1]	15	18	21	24 *23-25*	27 *26-28*	30 *29-31*
Theft Crimes (Over $2,500)	III	12[1]	13	15	17	19 *18-20*	21 *20-22*	23 *22-24*
Theft Crimes ($2,500 or less) *Check Forgery ($200-$2,500)*	II	12[1]	12[1]	13	15	17	19	21 *20-22*
Sale of Simulated Controlled Substance	I	12[1]	12[1]	12[1]	13	15	17	19 *18-20*

☐ Presumptive commitment to state imprisonment. First Degree Murder is excluded from the guidelines by law and continues to have a mandatory life sentence. See section II.E. Mandatory Sentences for policy regarding those sentences controlled by law, including minimum periods of supervision for sex offenders released from prison.

■ Presumptive stayed sentence; at the discretion of the judge, up to a year in jail and/or other non-jail sanctions can be imposed as conditions of probation. However, certain offenses in this section of the grid always carry a presumptive commitment to state prison. These offenses include Third Degree Controlled Substance Crimes when the offender has a prior felony drug conviction, Burglary of an Occupied Dwelling when the offender has a prior felony burglary conviction, second and subsequent Criminal Sexual Conduct offenses and offenses carrying a mandatory minimum prison term due to the use of a dangerous weapon (e.g., Second Degree Assault). See sections II.C. Presumptive Sentence and II.E. Mandatory Sentences.

[1] One year and one day

[2] Pursuant to M.S. § 609.342, subd. 2 and 609.343, subd. 2, the presumptive sentence for Criminal Sexual Conduct in the First Degree is a minimum of 144 months and the presumptive sentence for Criminal Sexual Conduct in the Second Degree – clauses c, d, e, f, and h is a minimum of 90 months (see II.C. Presumptive Sentence and II.G. Convictions for Attempts, Conspiracies, and Other Sentence Modifiers).

Effective January 1, 2003

Appendix B: Data and Methods

Data

The study sample includes all felony offenders sentenced in Minnesota in 2003 and who started probation or were released from prison or jail by December 31, 2012 to allow for a 3-year follow-up period (N=13,190).[18] Year 2003 was selected in order to allow offenders with more serious convictions and/or those with extensive criminal histories enough time to both serve out their sentence and have follow-up period long enough to capture a significant portion of all recidivists. This allows for a sample of offenders that is closely representative of a typical sentencing year, with the appropriate variation on the predictor variable (i.e. criminal history).

The Minnesota Sentencing Guidelines Commission (MSGC) data was matched with data provided by the Minnesota Department of Corrections, which provided the exact dates of prison release and parole revocation periods. This was used to calculate the appropriate start time of the follow-up period and the total time-at-risk post-release given temporary exits from the study when the offender was imprisoned due to technical violations while on supervised release.[19] One limitation of the data is that it does not include exact release dates for offenders sentenced to jail as a condition of probation. However, because the majority of offenders are released from jail by the time they serve two-thirds of their sentence, their release date is estimated as two-thirds of their conditional confinement time. Exits from the study due to technical probation revocations were also not captured.

For the main analysis, recidivism is defined as a new felony conviction within 3 years of release from prison or jail, or the start of probation. MSGC felony conviction data from January 1, 2004 to December 31, 2015 was used to determine whether an offender in the 2003 conviction sample recidivated. For the supplemental analysis (Appendix C), the recidivism outcome was expanded to include misdemeanor reconvictions. Reconviction data was collected from the Minnesota Bureau of Criminal Apprehension (BCA) from 2004-2015 and merged with the main felony sentencing dataset.

Descriptive Statistics

Table B-1 outlines the measures and the descriptive statistics used in the analysis. In 2003, 56.5% of all offenders in this sample received a criminal history score greater than zero, with an average score of 1.6 on a 0 to 6 scale. About a quarter (24.1%) of offenders recidivated over a three-year period post- release. The sample is overwhelmingly male (83%) and a majority of the offenders are racially/ethnically Non-Hispanic White (61.5%). The average age at sentencing is about 31. Offenders from Ramsey and Hennepin counties — Minnesota's main metro areas — make up 34.9% of the sample.

The average severity level of the conviction offense is 4 on a 1 to 11 scale. The most common 2003 convictions were for property offenses (36.1%), with drug offenses making up 26.9% of the sample, and person offenses making up 22.1% of the sample. A small portion (14.9%) of offenders received a conviction that could not be categorized as property, drug, or person, such as felony DWI or fleeing police (i.e. miscellaneous offense), and these offenses are referred to as "Other" by MSGC. The majority of offenders (67.1%) received a probation sentence which included a stay in county jail and 23% received a prison sentence. A minority of offenders (9.9%) were given a probation sentence that did not include a jail term.

Table B-1: Descriptive Statistics (N=13,190)

Dependent Variable	Percent	Mean	Min	Max	S.D.
Recidivated (felony reconviction)	24.1	—	—	—	—
Independent Variables					
Offender Criminal History					
Criminal History Score[20]	—	1.6	0	6	1.9
Offender Demographics					
Male (reference)	83	—	—	—	—
White[21] (reference)	61.5	—	—	—	—
Age at Sentencing	—	30.9	15	89	10.1
Metro County (reference)	34.9	—	—	—	—
Case Characteristics					
Severity Level	—	4	1	11	2.4
Property Offense (reference category)	36.1	—	—	—	—
Person Offense[22]	22.1	—	—	—	—
Drug Offense	26.9	—	—	—	—
Other Offense	14.9	—	—	—	—
Sentence					
Prison	23	—	—	—	—
Jail[23]	67.1	—	—	—	—
Probation	9.9	—	—	—	—

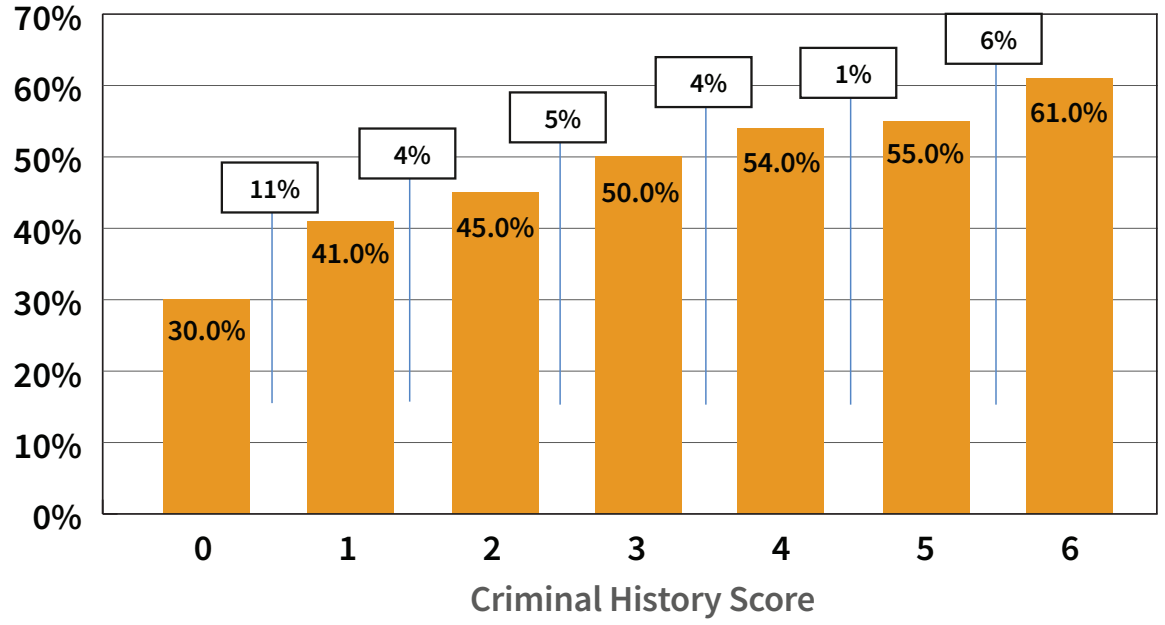
Analytic Strategy

To examine the relationship between the criminal history score (CHS) and recidivism, I look at the rate of recidivism at each level of the CHS and use a chi-squared test to determine if the levels are significantly different from each other. I then employ logistic regression to model the effect of the criminal history score on recidivism, controlling for relevant case and offender characteristics, in order to determine how each increase in the score increases the likelihood of recidivism.

To calculate the predictive accuracy of the CHS, I regress recidivism on the score to calculate an AUC statistic. For a CHS that groups offenders into multiple "bins" that should vary along a spectrum of risk, the AUC statistic indicates the chance that an offender who recidivates will obtain a higher score than one who does not. A value of 0.5 indicates that the score predicts recidivism no better than chance, while a score of 1 indicates that the score perfectly discriminates between recidivists and non-recidivists. The AUC has been widely used to assess the predictive discrimination of actuarial risk assessment instruments in much the same manner (Taxman & Dezember, 2017). In part II, to assess different formulations of the score, I recalculate the original score by modifying the calculation of certain score components and/or excluding components from the score completely, and calculate a new AUC for the new formulations. A chi-square test determines whether differences in the AUC statistics are statistically significant. In the third portion of the report, I use both descriptive statistics and OLS regression to explore the relationship between the criminal history score and recidivism type.

Figure C-1: Felony, Gross Misdemeanor, and Misdemeanor Reconviction Rates by Criminal History Score

N=13,190



Appendix C: Supplemental Analysis with Misdemeanor Convictions

Rate of Recidivism by Criminal History Score

In the supplemental analysis, the outcome variable is expanded to include gross misdemeanor and misdemeanor reconviction (keeping existing felony reconvictions).[24] Misdemeanor offenses are the most common offenses processed through the criminal justice system —outnumbering felony cases 3 to 1 (Stevenson and Mayson, 2018). Thus, the recidivism rate was expected to go up as the definition of recidivism was widened. The inclusion of misdemeanor reconvictions in the outcome variable increased the mean recidivism rate from 24% (with felony reconviction only) to 41%.

Figure C-1 shows the rate of misdemeanor and felony recidivism at every level of the criminal history score. The percentage in the callout boxes represent the percentage-point difference in recidivism between criminal history scores. Similar to the felony reconviction outcome variable, the rate of recidivism varies across the criminal history categories and steadily increases as the score goes up. Offenders with a CHS of zero recidivate at 30%, while twice as many (61%) offenders recidivated at CHS 6. However, the recidivism pattern also shows larger and more uneven jumps in the rate of recidivism between criminal history categories compared to the felony-only outcome variable (Part 1, Figure 1). The largest jumps in the rate of recidivism occur between offenders who have a CHS of 0 and 1 (11% increase), while the smallest shows a different of only 1 percentage point (between CHS 4 and 5).

Chi-square testing shows that the rate of recidivism varies significantly between the criminal history categories, overall (Pearson chi2(6)=569.65; p<.001). However, the difference in the rate of recidivism between CHS 3, 4, and 5 is not statistically significant and therefore could be due to chance.

Predictive Validity of the Criminal History Score

An AUC statistic provides a measure of how well the criminal history score predicts misdemeanor and felony reconviction. The AUC statistic for the expanded outcome variable is 0.62. This translated to a medium effect size (Rice & Harris, 2005), which is lower than the .64 AUC statistic for the felony only recidivism variable, and this difference is statistically significant (p<0.001). This means that the criminal history score is slightly more accurate at differentiating between felony recidivists and non-recidivists, than between misdemeanor and felony recidivists and non-recidivists. In sum, it appears that Minnesota's criminal history score is less effective at assigning longer sentences to more risky offenders when the outcome variable involves misdemeanor reconviction along with felony reconviction.

Discussion

In theory, the score could be modified to target the riskiest offenders regardless of felony or misdemeanor reconviction status. However, it is not clear whether that is a desirable goal. While looking at felony reconviction alone misses a large portion of criminal involvement that offenders engage in after release, combining both felony and misdemeanor reconvictions also conflates two different types of criminal activity. While some misdemeanor offenses present a public safety risk (e.g., DUI) many others involve criminal behavior that is of less concern to the public (e.g., disorderly conduct, petty theft). Policing minor, quality of life crimes produces a high volume of indigent misdemeanor defendants that are pressured to enter quick guilty pleas (Roberts, 2011) and contributes to racial disparities found in the system. Thus, if the underlying goal of the criminal history score is to protect the public, rather than assign longer sentences to offenders most at risk for minor criminal conduct, jurisdictions may want to maximize the efficiency of their score to target offenders most at risk for felony reconvictions (or even serious felony reconviction).

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18 The 2003 sample started with 14,492 sentencing events. It was reduced to one case per offender based on the last conviction offense in 2003 and the most serious offense within each court proceeding (N=13,279). An additional 89 offenders were taken out of the sample because they were not released by December 31, 2012. It should be noted that while these 89 offenders were the most serious offenders in the sample (in terms of sentencing severity/criminal history), they make up less than one percent of the total sample. However, the recidivism findings of this report are best generalized to offenders who are released from prison within a 10-year time-period.

19 Supervised release or probation revocations due to new charges would generally be captured because they would show up as a new conviction (i.e. recidivism).

20 Offenders who receive more than 6 raw points in the calculation of the score are put into CHS 6 category.

21 Non-white offenders include those of Hispanic origin, Asian, Native American, and African American.

22 This includes sexual offenses.

23 In Minnesota, a sentence of probation could include a jail sentence. For this analysis, I distinguish between offenders who received probation with a jail term (Jail) and probation as community supervision only (Probation).

24 Petty misdemeanors (e.g. speeding ticket) were not included in this count.

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