The Link Between Race-Ethnicity and a Pre-Sentence Prison Recommendation

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Abstract

Decades of research have demonstrated a systemic and nation-wide presence of racial and ethnic disparities in the United States' criminal justice system. Here we analyze 9,788 felony Pre-Sentence Investigation reports in Utah between 2015 and 2017. By examining the relationship between race-ethnicity and the severity of the pre-sentence recommendation, we find that Hispanics have an increased likelihood of receiving the most severe sentence recommendation in comparison to Whites. Policy implications around findings are discussed which has the potential to reduce current disparities as they occur at the Pre-Sentence Investigation level. The generational costs associated with the system's inequalities merits policy action on this salient issue.

Keywords: criminal justice, pre-sentence, racial disparity, regression analysis

Contents

1 Introduction

Racial disparities at each contact point with the justice system have been present in the United States' criminal justice system for more than 100 years.[1] The sources of these disparities have commonly been attributed to (1) differences in the type and rate of criminal behaviors (2) unequal treatment across groups and (3) a combination of the two (Rocque, 2011). Furthermore, differential treatment by systems and structural built-in criminal justice inputs and algorithms can unintentionally result in disparities to occur across groups.

Naturally, these disparities have resulted in disproportionate share of non-Whites serving time in correctional facilities throughout the United States. Figure 1 illustrates the U.S. incarceration rate per 100,000 population by race and ethnicity for individuals over 18 years of age in year 2017.[2] As seen in the figure, the incarceration rate for Blacks measured at 1,549 in year 2017. As a comparison, in the same year the incarceration rate for Whites measured at 272. Though the incarceration rate for Hispanics was less than for Blacks, measuring at 823 per 100,000 population, it was significantly higher than for Whites. While the disparity between incarcerated Whites, Hispanics, and Blacks have declined in recent years, Blacks and Hispanics are currently six times and three times respectively, more likely than Whites to be held in a state or federal correctional facility. While striking differences, it should be noted that these rates do not control for the offender's underlying offense type or severity, prior involvement with the system, or other factors relevant in determining a prison sentence.

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[1]See Hetey & Eberhardt, (2018) for a review of current literature as it relates to these disparities.

[2]See Bronson & Carson (2019) for a more in-depth discussion around these data.
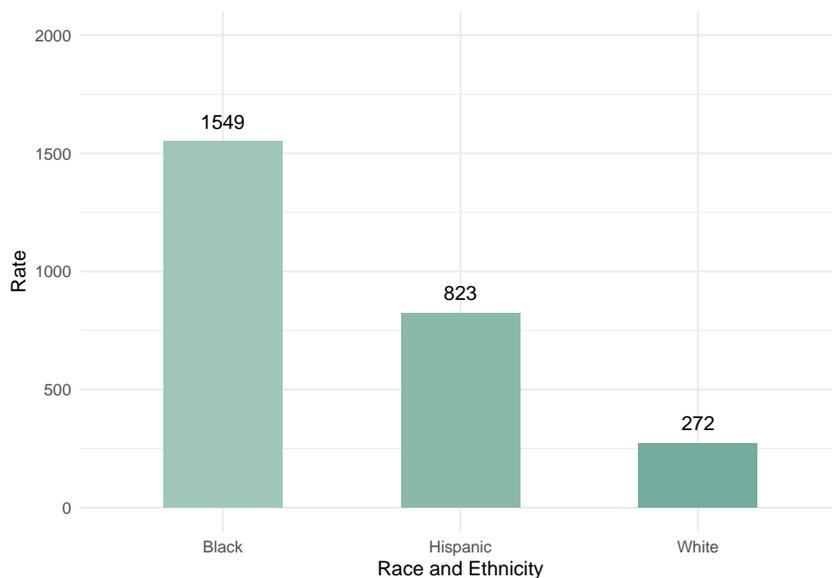
Figure 1: U.S. Incarceration Rate (per 100,000 US adult residents) by Race and Ethnicity in Year 2017

While it is well known that racial disparities exist,[3] how these disparities occur at specific stages in Utah's criminal justice system have been a research area of silence. To lessen part of this research gap, this study analyzes recommendations around the Pre-Sentence Investigation (PSI) process, focusing on the relationship between race and ethnicity and the severity of the PSI sentence recommendation. The relevance of understanding disparities as they *may* occur at this particular point in the sentencing process is highlighted by the fact that Utah has in recent years substantially increased the number of offenders that receive a PSI report. Furthermore, because a prison sentence is associated with lessened employment, educational and housing opportunities, assuring that the system is treating all individuals equal is important. It should be emphasized that this study does not speak to disparities that may have occurred at prior criminal justice decision points.

The following provides a brief overview of Utah's Pre-Sentence Investigation reporting process. Section 2 discusses the relevant data and methodology, while section 3 interprets the statistical results and notes the study limitations. Lastly, section 4 concludes and provides practical policy solutions.

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[3]See e.g., Roque (2011) and Rehavi & Starr, (2014) for a review of the current literature.

1.1 The Pre-Sentence Investigation Report

In the state of Utah, a recommendation of either probation, jail, or prison should be based on an offender's criminal history score, and the severity and type of their most recent offense. Additionally, the offenders mitigating/aggravating factors are taken into consideration. The criminal history score is based on the offender's past involvement with the justice system. The score then places offenders into a category between 1 and 5, with 5 being the most severe. Based on these factors, the offender is placed in one of three areas of a sentencing matrix. The criminal history score and the sentencing matrices are developed and published by the Utah Sentencing Commission. The row of the sentencing matrix denotes the level of the offender's criminal history while the columns denote the severity and type of their current offense.[4] Placement on the sentencing matrix is determined by probation officers and is part of a Pre-Sentence Investigation report, which is shared with the defense attorney and the prosecutor who can review it for errors. The report is also sent to the Judge who will make the final decision regarding the nature and length of the offender's sentence. While the PSI report itself does not determine an offender's sentence type or length, it is an important document involved in the Judge's decision-making process. It should be emphasized that the writer of the PSI report has no control over the offender's initial charges and their associated convictions.

2 Data & Methods

2.1 Data

9,788 unique records were obtained from the Utah Department of Corrections (UDOC) database, O-Track, between October 2015 and September of 2017. Here a unique record is defined as a combination of a PSI report written at a unique date. Hence an offender may have multiple PSI reports within the given time period, each representing a unique date and conviction combination. Criteria for

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[4]The general sentencing matrix can be seen in Appendix A. For additional information, please visit: https://justice.utah.gov/Sentencing/

inclusion comprise those convicted of a felony offense[5] and necessitated a valid criminal history score, and a sentence recommendation of either prison, jail only or probation.

Demographics including age and gender are included as important control variables. The relevant criminal justice associated variables include the type and severity of the current offense as well as the offender's criminal history category. The type of the current offense denotes the highest offense associated with the current case and is classified either as drug possession only, drug and/or alcohol, driving, property, person, murder, or a category called "other."[6] The offense severity denotes whether the current offense was a first-degree, second-degree, or a third-degree felony, with first-degree felony being the most severe. The variable denoting the offender's race and ethnicity is comprised of four different binary variables. These include White,[7] Hispanic,[8] Other, and a category labeled as Unknown. The dependent variable denotes whether the offender received a prison recommendation versus a jail only/probation recommendation, with prison being the most severe. A description of all variables is provided in Table 1.

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[5]Includes felony offenders whose most severe offense *type* pertained to person, property, drugs and alcohol, driving, weapons, murder or a category labeled as "other."

[6]The "other" offense category also includes a small number of weapon offenses.

[7]The category "White" is comprised of white offenders that are of non-Hispanic origin.

[8]The variable denoting Hispanic origin include: Hispanic Caucasian, Hispanic Black, and Hispanic Native American.

Table 1: Definition of Variables

Variable name	Description
prison rec	Binary variable denoting a prison recommendation (vs. jail only/probation)
age	Age (in years) of the offender
male	Indicates if the offender is male
white	Indicates if the offender is White
hispanic	Indicates if the offender is Hispanic
other	Indicates if the offender is either Black, Asian, Native American, or Pacific Islander
unknown	Indicates if the offender's race is Unknown
severity	Categorical variable indicating the severity of the offense (F1, F2, or F3)
criminal_history	Categorical variable indicating the offender's criminal history category (1-5)
alc_drug	Indicates if the current offense was a drug or alcohol offense
driving	Indicates if the current offense was a driving offense
drug_poss	Indicates if the current offense was a drug possession only offense
property	Indicates if the current offense was a property offense
person	Indicates if the current offense was a person crime
murder	Indicates if the current offense was a murder offense
other_crimes	Indicates if the current offense was uncategorized

Summary statistics are presented in Table 2. The mean age was 35.4 while roughly three fourths of the PSI reports involved a male offender. Sixty-eight percent of the reports involved a White offender of non-Hispanic origin while 13 percent of reports involved a defendant of Hispanic origin. Offenders whose race and ethnicity represented less than 5 percent of the sample were grouped into a category called "other."[9] Lastly, 8 percent were categorized has having an "Unknown" race.

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[9]This category includes: Black (4.8%), Native American (2.8%), Pacific Islander (1.7%), and

In terms of the criminal justice associated variables, 37 percent of the offenders were property offenders, followed by person and alcohol/drug offenders (at 15 and 17% respectively). A small percent of offenders belonged to the crime types of murder and a category labeled as "other crimes."[10] The mean severity was 1.2 while the mean criminal history categorical score was 2.4.

Table 2: Summary Statistics (N=9,788)

Variable	Mean	Std. Dev.	Min	Max
prison rec	0.19	0.39	0.00	1.00
age	35.36	10.12	18.46	81.28
male	0.76	0.43	0.00	1.00
white	0.68	0.47	0.00	1.00
hispanic	0.13	0.34	0.00	1.00
other	0.11	0.31	0.00	1.00
unknown	0.08	0.27	0.00	1.00
severity	1.20	0.43	1.00	3.00
criminal_history	2.37	1.19	1.00	5.00
alc_drug	0.17	0.37	0.00	1.00
driving	0.11	0.31	0.00	1.00
drug_poss	0.12	0.33	0.00	1.00
property	0.37	0.48	0.00	1.00
person	0.15	0.36	0.00	1.00
murder	0.01	0.10	0.00	1.00
other_crimes	0.07	0.25	0.00	1.00

Overall, 19 percent of the PSI reports involved a prison recommendation, which differed by group (seen in Figure 2). Specifically, 19 percent of PSI reports involving a White offender had a prison recommendation while 27 percent of reports involving Hispanics had a prison recommendation, representing a 45 percentage difference between groups. The PSI reports involving the two additional categories of "Other"

Asian (1.1%).

[10]The variable "other_crimes" includes OTrack's definition of "other" and "weapon" crimes.

and "Unknown" had a prison recommendation 22 percent and 6 percent of the time respectively. It should be noted that the mean offense severity and criminal history categorical score were lower for the unknown racial group. This likely explains the low rate of prison recommendations for this group.
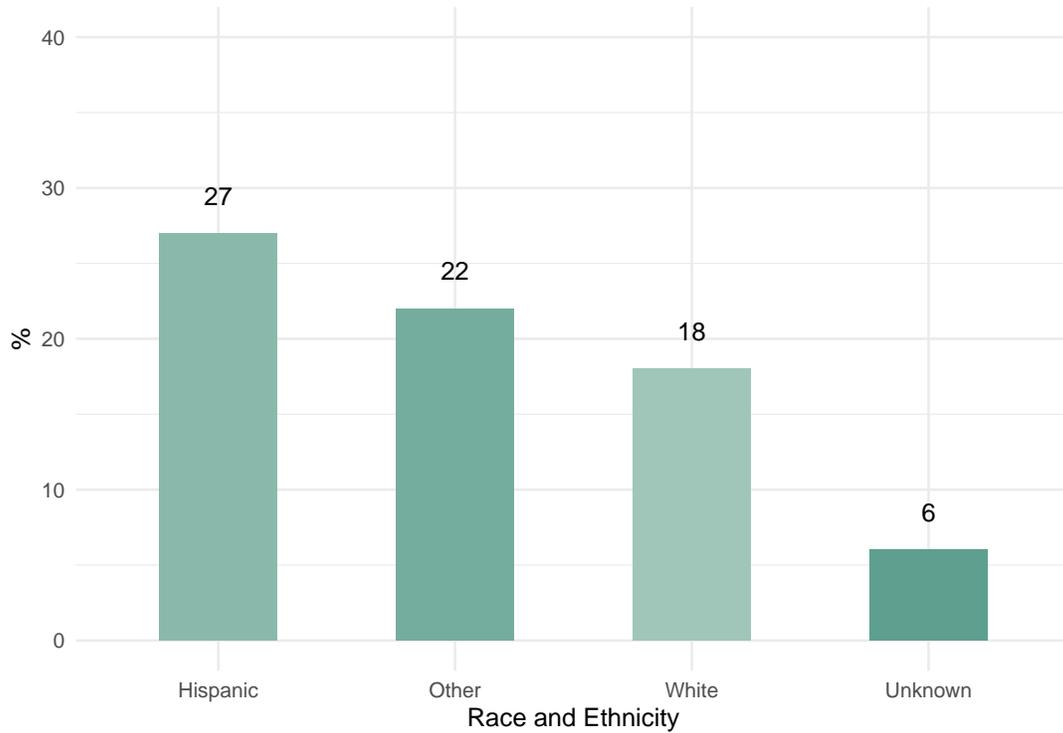

Figure 2: Percent Recommended Prison by Race and Ethnicity

2.2 Methods

Two statistical techniques were applied in modeling the probability of a prison recommendation by race and ethnicity, with the unit of analysis being the PSI report. The linear probability model (LPM) is the ordinary least square model when the dependent variable is binary. It estimates the predicted probability that the dependent variable equals one, conditioned on the model's covariates ($P(Y=1|X)$). While the linear probability model has advantages in its ease of coefficient interpretation, it is often criticized for its unrealistic assumptions regarding linearity, non-conforming predictive probabilities, and its inherent violation of homoscedasticity. While the

latter may be overcome by estimating the model with robust standard errors, the assumption regarding linearity is often troublesome.

As an alternative method, logistic regression developed by Cox (1958) is a commonly used statistical technique when the dependent variable is either categorical or binary and varies in its underlying assumptions. Due to this, the logistic model is often preferred to the linear probability model. The logistic model's coefficients are expressed in odds ratios. In the binary case, the odds ratio represents the odds of two groups on the likelihood that the dependent variable is equal to one. Because the odds ratio is simply defined as the beta coefficient of base e, taking the natural logarithm of the odds ratio yields the beta coefficient, which is expressed in terms of log odds. In order to compare the coefficients between the logistic and the linear probability model, one can further transform the odds into probabilities.

3   Discussion

3.1   Regression Results

The regression results are presented in Table 3.[11] The coefficients of the logistic regression were translated to a probabilistic scale for increased ease of interpretation and to allow for a direct comparison to the coefficients of the LPM model.[12] As seen in the Table, the results of the two regression models align both in terms of significance and coefficient size. Specifically, the variable denoting the offender's age lack statistical support for both models while the variable denoting gender is significant and has a positive coefficient sign. In terms of gender, being male (in comparison to being female) increases the probability of receiving a prison recommendation.

Drug possession only offenses were excluded from the analysis and thereby used in reference to the other offense types. As expected, in comparison to a drug possession only offense, all the other offense types increase the probability of receiving a prison recommendation. The significance and coefficient sign for the variable denoting the severity of the offense is as also as expected, with the

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[11]The linear probability model was estimated with robust standard errors as a remedy for heteroscedasticity.

[12]Model performance was evaluated via a confusion matrix.

probability of receiving a prison recommendation increasing as the severity of the current offense increases. Additionally, the coefficients for the criminal history categories 2 to 5 are significant and have the expected sign. In comparison to the criminal history category of one, individuals associated with criminal history categories 2 to 5 have an increased probability of receiving a prison recommendation.

White offenders were removed from the analysis and thereby serve as a baseline for the other racial and ethnic categories. As seen in the table, the Hispanic variable has a coefficient of 0.06 for the LPM model and 0.05 for the logistic model. In comparison to Whites, the probability of receiving a prison recommendation increases by 5 and 6 percentage points for offenders of Hispanic origin. This is an important finding considering that the overall base rate of prison recommendations was 19 percent. The coefficient for the race variable "other" is positive but is not significant at any of the conventional testing levels. Lastly, offenders with an unknown race and ethnicity were less likely to receive a prison recommendation in comparison to Whites across the two analyses by 5 percentage point and 8 percentage points respectively.

Table 3: Linear Probability Model (LPM) and Logistic
Model Regression

	LPM		Logistic	
Variable	**Estimate**	**Std. E**	**Estimate**	**Std. E**
age	0	0.00	0	0
male	0.04***	0.01	0.06***	0.01
hispanic	**0.06***	**0.01**	**0.05***	**0.01**
other	0.01	0.01	0.01	0.01
unknown	-0.05***	0.01	-0.08***	0.02
severity				
felony_2	0.13***	0.01	0.13***	0.01
felony _1	0.40***	0.04	0.45***	0.05
alc_drug	0.08***	0.01	0.08***	0.01
driving	0.13***	0.01	0.13***	0.01
property	0.07***	0.01	0.08***	0.01
person	0.22***	0.01	0.20***	0.01
murder	0.71***	0.04	0.59***	0.05
other_crimes	0.14***	0.02	0.14***	0.02
criminal_history				
cat_ 2	0.05***	0.01	0.05***	0.01
cat_ 3	0.18***	0.01	0.17***	0.01
cat_ 4	0.39***	0.01	0.38***	0.01
cat_ 5	0.74***	0.02	0.72***	0.02
_cons	-0.15***	0.02	-	-

* p < 0.10, ** p < 0.05, *** p < 0.001

The logistic regression's marginal effects, fixed at each level of offense severity and the criminal history categorical score, and evaluated at the mean values of the other covariates is shown in Figure 3. As seen, a difference between Hispanics and Whites is evident across the three levels of offense severity and the five criminal history categories. The disparity appears to be particularly elevated with PSI reports involving Felony 2 offenders and reports where the offender had a criminal history categorical score of I and II.[13] In terms of offense severity, one third of

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[13]These results may be influenced by the smaller number of individuals, or PSI reports that

PSI reports can be expected to include a prison recommendation for a Hispanic individual, while only 20 percent of PSI's completed for White individuals can be expected to include a prison recommendation (a 33 percentage change difference). Similarly, for criminal history category II, 9 percent of PSI's involving a Hispanic offender can be expected to include a prison recommendation which is reduced to 6 percent for Whites (a percentage change difference of 50%).

The figure further shows these marginal effects for the sample's most common offense types, namely, property (37% of the sample) and alcohol & drug related offenses (at 17%), while again, holding the other covariates fixed at their mean values. In comparison to PSI reports involving Whites, Hispanics are more likely to receive a prison recommendation for a property related offense (22% vs. 15%, translating to a 47 percentage change difference). Similarly, Hispanics are more likely to receive a prison recommendation for an alcohol & drug related offense (25% vs. 17%, translating to a 47 percentage change difference).

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belong to criminal history category I.
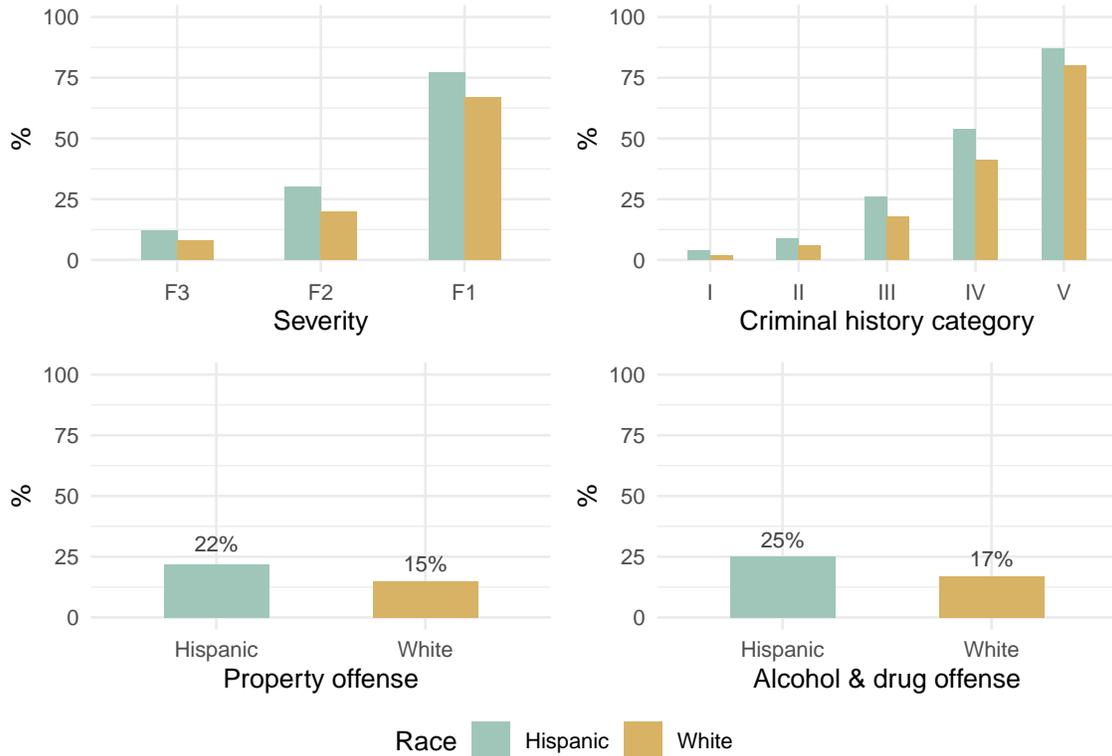
Figure 3: Percent expected to receive a prison recommendation

3.2 Limitations

While this study analyzed data pertaining to the offender's criminal history, the severity and the type of the offender's current offense, information on aggravating and mitigating factors were not available. Furthermore, a significant percent of the sample had an *unknown* race and ethnicity, which clouds distinction between groups. Additionally, because there were a small percent of offenders in some of the racial categories, grouping of races were deemed necessary. Lastly, some offenders did not have a criminal history score, which necessitated excluding those individuals from the analysis.

4 Conclusions & Policy Implications

4.1 Conclusion

Decades of research have demonstrated a systemic and nation-wide presence of racial and ethnic disparities in the United States' criminal justice system. Here we analyzed the relationship between race and ethnicity on the severity of the Pre-Sentence Investigation report sentence recommendation in Utah. By examining close to 10,000 PSI reports and controlling for the offender's offense type, offense severity and criminal history, findings were in support of a significant relationship between ethnicity and the severity of the PSI recommendation for offenders of Hispanic origin. In comparison to Whites, Hispanics were found to have an increased probability of receiving the most severe sentence recommendation while no statistical difference was seen amongst Whites and other racial and ethnic groups. The findings from this study elucidate the continuing issue of racial and ethnic disparities in our nation's criminal justice system as it relates to differential treatment by systems.

4.2 Policy Implications

I should be emphasized that this study solely focuses on decisions made around the Pre-Sentence Investigation level and therefore, does not speak to disparities that may have occurred at prior criminal justice contact points. Keeping this in mind, the racial and ethnic disparities identified in this study may be the result of current policies and guidelines around the PSI writing process. For example, a review around current mitigating and aggravating factors revealed that many of these factors are tied to an individual's financial resources. Specifically, having access to *more* financial resources is linked to several mitigating and hence, sentence reducing factors, are often not available to non-White individuals.[14] These built-in policies may have *unintentionally* created room for racial and ethnic disparities to occur. Analyzing to what extent current mitigating and aggravating factors explain differences in outcomes and how selection of these factors may vary across PSI writers is an important first step in addressing these disparities.

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[14]It is standard practice to include both employment and financial factors in criminal justice risk and needs assessments.

Furthermore and as previously mentioned, contributing factors behind racial and ethnic disparities have been largely ascribed to individual differences in criminal behavior, system differences in treatment across groups, or a combination of individual and system differences. For example, unequal treatment across groups can be attributed to either direct policies and efforts that discriminate against people of color, known as explicit bias or be the result of an implicit bias. An implicit bias is defined as an unconscious attitude or stereotype attributed to someone's race. Implicit bias may bleed into the criminal justice system at each level of decision making (e.g., arrest, prosecution, parole & probation officer recommendation, and the final decision made by the Judge). Indeed, such bias may influence decisions subject to discretion even amongst the most well-meaning professionals. While these biases do not carry the malicious intent as direct racism, their presence can be equally damaging to individuals that are on the receiving end (Van Cleve, 2016).

While enhanced training around implicit and explicit bias could lessen current disparities, reducing discretion around the PSI writing process may be a more promising direction as enhanced training to criminal justice professionals around these biases has shown to have limited efficacy. Indeed, though these initiatives have been implemented throughout the nation at various decision points in the criminal justice system, research demonstrating its long-term effectiveness is lacking (see e.g., Swencionis and Goff, 2017). Instead, increasing the system's reliance on sound and well researched algorithms that carefully incorporates well-researched aggravating and mitigating factors may be a more viable solution. Though the initial design and on-going quality assurance around such algorithm would be critical and require an upfront and possible on-going investment, if done with merit, pursuing this policy option has the potential to reduce disparities at the PSI level and subsequent criminal justice decision points.

APPENDIX

FORM 1 – GENERAL MATRIX
CRIMINAL HISTORY SCORING

These are guidelines only. They do not create any right or expectation on behalf of the offender. Matrix time frames refer to imprisonment only. Refer to the categorization of offenses with the exception of "Specific 3rd ", which are the specific 3rd Degree Offenses of: DUI, Possession of Firearm by Restricted Person, and Failure to Stop at Command of Law Enforcement Officer.

PRIOR FELONY CONVICTIONS (SEPARATE ADULT CASE NUMBERS)		PRIOR PERSON OR FIREARM CONVICTIONS (ADULT OR JUVENILE)	
2	ONE	2	MISD. PERSON OFFENSE (AD.B)
4	TWO	2	FEL. FIREARM OFFENSE (76-10-5)
6	THREE	4	FELONY PERSON OFFENSE (AD.B)
8	FOUR+	6	HOMICIDE OFFENSE (76-5-2)

PRIOR CLASS A MISDEMEANOR CONVICTIONS (SEPARATE ADULT CASE NUMBERS)
1 ONE OR TWO
2 THREE - FIVE
3 SIX

PRIOR JUVENILE ADJUDICATIONS WITHIN PAST 10 YEARS (OFFENSES THAT WOULD HAVE BEEN FELONIES IF COMMITTED BY ADULT) (3 CLASS A ADJUD. = 1 FELONY)
1 ONE
2 TWO - FOUR
3 FIVE+

SUPERVISION HISTORY (ADULT ONLY – FEDERAL, AP&P, PRIVATE, COUNTY, PROBLEM SOLVING COURT REMOVAL*)
2 PRIOR REVOCATION
3 CURRENT OFFENSE ON SUPERVISION

MOST RECENT POST-CONVICTION CRIME FREE GAP (COUNT FROM LATEST DATE OF SENTENCING/ CASE RESOLUTION FOR PROBATION OR DATE OF RELEASE FROM PRISON)(GAP ENDS AT NEW OFFENSE DATE)(EXCLUDE INFR, CLASS C, CLASS B TRAFFIC AND MINOR REGULATORY OFFENSES PER §77-40-102(10))
-1 3+ YEARS
-2 5+ YEARS
-3 7+ YEARS
-4 10+ YEARS

TOTAL SCORE: _____

OFFENDER'S NAME:	SCORER'S NAME:	DATE SCORED:	CRIMINAL HISTORY ROW	
ACTIVE CONVICTIONS (MOST SERIOUS FIRST):	CRIME CATEGORY:	TIME:	V	16+
			IV	12 – 15
			III	8 – 11
			II	4 – 7
		TOTAL:	I	0 – 3

CRIME CATEGORY

CRIMINAL HISTORY		1st Degree Person	1st Degree Other	2nd Degree Person	3rd Degree Person	2nd Other Specific 3rds	2nd Poss 3rd Other	3rd Poss Class A**
		A	B	C	D	E	F	G
	V	120 MOS	84 MOS	54 MOS	32 MOS	26 MOS	16 MOS	12 MOS
	IV	108 MOS	78 MOS	42 MOS	26 MOS	20 MOS	14 MOS	10 MOS
	III	96 MOS	72 MOS	30 MOS	20 MOS	16 MOS	12 MOS	8 MOS
	II	84 MOS	66 MOS	24 MOS	16 MOS	14 MOS	10 MOS	6 MOS
	I	72 MOS	60 MOS	18 MOS	14 MOS	12 MOS	8 MOS	4 MOS

IMPRISONMENT

JAIL AS INITIAL CONDITION OF PROB.

PRESUMPTIVE PROBATION

* A problem-solving court is a specialized court designated by the Utah Administrative Office of the Court. Every Problem-Solving Court or RIM violation/sanction should not be counted as a revocation. An Order to Show Cause with revocation and actual removal from the Problem-Solving Court is required in order to count as prior revocation of supervised probation. An Order to Show Cause with revocation and actual removal is required to count current offense on supervision.

**Time periods only apply to Class A offenses sentenced to prison under §76-3-208(1)(b). Form 5 applies to sentencing of misdemeanor offenses under §76-3-208 (1)(c).

2017 - Utah Sentencing Commission 26

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