Smart decarceration: Are pretrial assessments an effective strategy to detain fewer people and reduce arrests?

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Abstract

Mass incarceration is a social problem facing the U.S. that has negative impacts for people of color. Many reform efforts are underway to reduce prison and jail populations, with pretrial assessments being one potential reform. There is a gap, however, in understanding how assessments compare to current pretrial release practices. We use data from all individuals admitted to a large county jail system (n = 28,188) from January 2017 through December 2018 to forecast new arrests for individuals detained by the court, rank order everyone, and compare release and new arrest rates between the risk-based release forecasts and observed release decisions. The findings estimate that a risk-based release process could result in reducing pretrial incarceration by 7 percent and new arrests by 13 percent. Our forecasts demonstrate that pretrial assessments have the potential to improve court release practices by detaining fewer people and decreasing new arrests. The research and policy implications of the study findings point to potential strategies to effectively reduce jail incarceration without increasing new arrests.

Keywords: jail incarceration, pretrial detention, risk assessment, decision making

1. Introduction

The U.S. has the highest incarceration rate of all industrialized countries in the world (Sutton, 2013). This includes six million adults who are admitted to local jails each year, and more than 700,000 adults who are incarcerated each day in jails with about 400,000 of those who are detained prior to their trial (Zeng, 2022). Some argue that pretrial detention is necessary for achieving public safety goals, such as ensuring court attendance and avoiding new crimes, especially violent crimes (Cassell and Fowles, 2020). Recent scholarship, however, has suggested that pretrial detention leads to higher conviction rates, longer sentences, and higher recidivism rates (Dobbie, Yang, and Goldin, 2018; Lowenkamp, 2022; Walker, 2022). In the U.S., jails appear a necessary but unfortunate institution. In the current study, we seek to advance policy recommendations that can help court officials identify strategies for detaining fewer people without compromising public safety.

Outside of the severity of someone's current charges and their record of prior criminal involvement, there is little known about what factors shape current judicial release practices. The lack of clear guidelines for release creates a situation in which individuals who pose little risk of missing court or being rearrested are detained in custody prior to their trial (DeMichele et al., 2023). Additionally, individuals who pose a greater threat of missing court and being rearrested can also be released during the pretrial period (Kleinberg et al., 2018). In response, there has been a growing emphasis on the development and implementation of pretrial assessments that can be used to improve pretrial decision-making procedures (Desmarais et al., 2021).

In this paper, we compare release and arrest rates for new crimes (observed and predicted) based solely on local release practices to a series of counterfactuals generated if release decisions were made at different cutoff thresholds using a pretrial assessment, the Public

Safety Assessment (PSA).[1] We build on Kleinberg et al. (2018) by using random forest imputation to forecast outcomes for the individuals detained by the court. We use data from all individuals admitted to a large county jail system (n = 28,188) from January 1, 2017 through December 31, 2018 to forecast new arrests for individuals detained by the court, rank order everyone, and compare release and new arrest rates between the assessment and observed release decisions. The research is motivated by the goal of evaluating the contributions pretrial assessments could potentially have for improving pretrial release decisions and the realization that even assessments with high predictive validity (e.g., high AUCs) may not improve upon judges that are good at assessing individual risk levels (i.e., identify individuals above and below mean risk). Similarly, assessments with low predictive validity can improve upon release practices that appear more random (i.e., releasing individuals across the risk distribution) (Kleinberg et al., 2018).

Our analysis demonstrates a practical forecasting approach to compare current release practices to the various release recommendations made by a pretrial assessment by investigating the tradeoff between release rates and new arrests. First, we review relevant findings on the research about human decisions supported by statistical reasoning. Second, we summarize recent research on assessment validations and bias testing. Third, we describe prior research on the risk profile of released and detained individuals during pretrial. Next, we present our methods and findings that illustrate the PSA's new crime arrest scale has potential to detain fewer individuals and potentially reduce new arrests. Lastly, we summarize the implications of our research and offer recommendations for future research.

[1] The authors of the current paper were not involved in the development and initial validation research used to develop the Public Safety Assessment (see VanNostrand and Lowenkamp, 2013).

Pretrial Decision Making and Statistical Reasoning

Researchers have compared the predictive accuracy of statistical and clinical decision-making approaches for nearly 70 years. Meehl's (1954) systematic review provided initial evidence that human decisions are based on intuitive judgments in which people inconsistently weight factors. Subsequent studies across several disciplines (e.g., education, psychology, mental health) have demonstrated that decisions supported by actuarial tools are more accurate than clinical judgement (Ægisdóttir et al., 2006; Dawes, Faust, & Meehl, 1989; Grove et al., 2000; Grove, 2005). This research suggests that people make systematic errors in judgement because they are overconfident in decisions, face challenges processing large amounts of data, and rely on several cognitive biases (e.g., confirmation, framing, and anchoring biases) (Kahneman and Tversky, 1979). Actuarial instruments, on the other hand, offer an objective rationale for making decisions based on the results of statistical analyses.

It is not surprising that judges rely on one's past and current criminal activity when making pretrial decisions. Such determinations about release, however, are often made in only a couple of minutes and with little information about the individual and his or her circumstances (DeMichele & Baumgartner, 2021). This situation provides fertile ground for judges to employ cognitive heuristics that could lead to systematic errors in judgments (Karnow, 2008). The use of pretrial assessments has the potential to provide better "clarity and transparency about the ingredients and motivations of [judicial] decisions" (Kleinberg et al., 2020: 38). Moreover, interviews with judges demonstrated that assessments have the potential to ease the reliance on intuitive judgement by allowing judges an opportunity to reflect on various aspects of the case – what some have referred to as a cognitive (heuristic) override (DeMichele et al., 2021).

Pretrial Assessments: Valid Instruments that Lack Statistical Bias

Pretrial assessments were initially developed out of concerns for disparate treatment of people of color and the poor. The Manhattan Bail Project launched the Vera Institute of Justice with an experiment to show that an assessment contributed to increases release rates without increasing missed court appearances (Ares et al., 1963). Assessments were thought to help judges avoid the intuitive calculations that may rely on cognitive heuristics and lead to disparities against vulnerable groups. Pretrial assessments provide a systematic inclusion of factors, weights, and scores that allow for retrospective analysis to understand why judges made certain decisions (Thaler, 2016).

The suggested benefits of pretrial assessments have been countered by critics with the argument that assessments exacerbate racial bias. Sentencing scholars argued that certain assessment factors are proxies for race such as prior drug use, residential instability, and employment (Harcourt, 2015; Starr, 2014). Developers incorporated these critiques into new pretrial assessment, limiting the number of items that could serve as direct proxies for race. The Public Safety Assessment (PSA), for example, relies only on historical information about court outcomes (e.g., prior convictions) and current charge information to predict failure to appear and new criminal arrests (NCA). Unlike other pretrial assessments, the PSA does not include any socio-economic or other dynamic factors (e.g., residential stability, substance abuse) to predict pretrial outcomes.

Prior scholarship has demonstrated that there are benefits to jurisdictions after adopting a pretrial assessment. Post-implementation studies, for example, have shown that risk-based decisions are associated with reductions in missed court, new crimes, and reduced reliance on cash bond (Cooprider, 2009; Levin, 2006). Lowder, Diaz, Grommon, and Ray (2020) found that structured pretrial release guidelines improved the adherence to pretrial risk assessment recommendations and the assessment increased the likelihood for individuals to be released with non-financial conditions. Other studies have found that the incorporation of pretrial assessments have led to reductions in jail populations (Lowenkamp, DeMichele, and Klein-Warren, 2021; Mahoney et al., 2001), and the imposition of less restrictive conditions (including financial requirements) among those released (Toberg, Yezer, Tseng, and Carpenter, 1984). In a study of the Kentucky pretrial system, however, Stevenson (2018) found that despite initial reductions in jail populations after implementing the PSA, jail populations slowly started to increase.

There are concerns that pretrial assessments may contain inherent bias against people of color. In two studies of the PSA, the authors found a lack of evidence of bias with the PSA when comparing error rate imbalance (DeMichele & Baumgartner, 2021) and calibration (i.e., equality of slopes) (DeMichele et al., 2020). Others have completed a meta-analysis that included 11 studies examining six pretrial assessments and found that lower levels of accuracy in tools predicting pretrial misconduct for defendants of color compared to White defendants (Demarais et al., 2021). Some research has shown slight increases in failure to appear and new criminal arrest rates but did not find any evidence that the use of the PSA exacerbated racial bias (Stevenson, 2018). Pretrial follow-up periods are shorter than traditional post-conviction studies, and many crime patterns found in longer recidivism studies do not hold in pretrial data (e.g., lower base rates, smaller differences by race and sex) (DeMichele et al., 2023). Summarizing the debate about racial bias, leaves us with the need to understand whether assessments exacerbate bias relative to clinical judgment.

Release and Detain Across the Risk Continuum

Prior research has shown that current release processes result in detaining many low-risk people, and they release many high-risk people. In a study of pretrial defendants, Kleinberg et al.

(2018) found that judges released about 50% of the riskiest 1% of defendants (i.e., 63% new arrest rate, 5% violent arrest rate), which suggested that judges were potentially not using definitive risk thresholds, mis-ranking individuals, or relying on other factors to make their decisions. Similarly, DeMichele et al. (2023) found that of the 1,326 people who were retrospectively scored as the riskiest individuals in a pretrial sample (with NCA score of 6), 35% (n = 466) of these individuals were released to the community during pretrial.

Intuitively, what appears to be happening is that judges are making tradeoffs between release and failure rates within a bounded decision framework. The use of a statistically created assessment, however, would allow judges to rank order individuals according to group-based risks and to select detention, supervision conditions, and bail according to predicted probabilities. Pretrial assessments are typically built using historical datasets of prior pretrial release decisions and individual outcomes for a new arrest. However, Lowder and Wilson (2021) demonstrated that assessments may deflate predictive validity because they are built using incomplete data due to missing outcomes for detained individuals (i.e., selective labels problem).

Pretrial assessments are built using only data from the individuals released in a pretrial sample because the detained individuals lack the potential for a new arrest (i.e., exposure time for Y = 0) (Lowder and Wilson, 2021). The issue is known as a selective labels problem because judges' release decisions determine the people for whom we see outcomes (i.e., the released sample), and these are the very release decisions pretrial assessments are trying to influence. Therefore, the availability of the outcome data (e.g., new arrests) is shaped by the decision makers (i.e., judges) we are trying to improve upon, making it difficult to compare human judgements with the pretrial release decisions associated with a pretrial assessment.

Current Study

In the current study, we assess how actual release decisions compare with a model of release based on the score and rank order of a pretrial sample using the PSA new criminal arrest (NCA) risk scale on projected release and arrest rates.[2] This study is motived by prior research in which Kleinberg et al. (2018) created a rule-based release tool to test the detention and new arrest rates across different risk thresholds. They estimated that this model could help reduce crime by nearly 20% while holding the release rate constant, and could further release almost 25% more people when the crime rate is held constant to the observed level.

To our knowledge, Kleinberg et al. (2018) represents the only study to date that has compared the potential impact of a rules-based release model on the number of individuals released during pretrial and its impact on measures of public safety. Despite the advancements of the study, however, it did not directly examine how a pretrial assessment could be used within a local jurisdiction. Corresponding with the increasing implementation of pretrial assessments, we suggest that one method for developing a rule-based release model could be the information gained from an actuarial risk scale. In the current study, therefore, we seek to answer three research questions to better understand how the PSA's NCA scale – and potentially pretrial assessments more broadly – could be used by judicial officials to decrease the number of people detained and maintain arrest levels. These research questions include:

1. *Incarceration Rates*: Can decisions based on a ranked ordering of the NCA scale increase the number of people released during pretrial, while maintaining arrests rates compared to current judicial release practices?

[2] The PSA includes three scales to measure failure to appear, new criminal arrest, and new violent criminal arrest. The failure to appear and new criminal arrest scales are used to develop release recommendations, whereas the new violent criminal arrest scale is used as an indicator of likelihood to be arrested for a new violent crime. Our analyses are only with the new criminal arrest scale.

2. *New Arrests*: Can decisions based on a ranked ordering of the NCA reduce new arrests, while maintaining release rates compared to current judicial release practices?
3. *Racial Disparity*: Can decisions based on a ranked ordering of the PSA reduce racial disparity in detention compared to current judicial release practices?

By answering these research questions, we can develop an understanding of how the implementation of a pretrial assessment could potentially be used to inform pretrial release decisions and influence the number of individuals detained during pretrial and public safety.

6. Methods

6.1. Sample

We collected official data from a large county jail system in a Southeastern state that was linked with state level court and criminal history records to create a sample of 28,188 unique individuals – only first entrance for individuals admitted more than once – on pretrial between January 2017 and December 2018. Nearly 30% of the sample (n = 8,199) were detained in jail during their entire pretrial period (here in the *detained subsample*) and 19,989 individuals (71%) were released into the community during their pretrial period (here in the *released subsample*). The official data allowed us to retrospectively score the PSA NCA scale, identify if an individual had been released into the community and experienced a new arrest while in the community, and measure key covariates. These data provide a unique opportunity for jurisdictions to conduct research prior to implementing the PSA (or other pretrial assessments) as our study uses retrospective data to understand how the NCA scale could have contributed to reducing jail populations without increasing new arrests.

6.2. Measures

6.2.1. New arrest

New arrest was operationalized as a dichotomous indicator identifying if an individual was arrested for a new crime before the adjudication of their current charge. All cases were followed from the date of the initial jail admission until disposition or through December, 2019. Importantly, only those individuals who were in the released subsample had the ability to receive a new arrest.[3] Individuals in the detained subsample (n = 8,199) were coded as missing on new arrest.

6.2.2. The NCA Score for the PSA

We calculated the NCA scores for everyone in the sample. The NCA scale includes static criminal history variables that can be scored without an interview, which allowed us to construct scores for the detained and released subsamples. The seven factors involved in calculating the NCA score are: (1) 23 years old or less at the time of arrest, (2) pending charge at the time of the arrest, (3) misdemeanor conviction before the current arrest, (4) felony conviction before the current arrest, (5) violent conviction before the current arrest, (6) failure to appear for court in the past 2-years, and (7) sentenced to incarceration before the current arrest. Using these items, the NCA score for an individual was computed on a 1 to 6 range, where lower scores are indicative of a lower likelihood of experiencing a new arrest and higher scores are indicative of a higher likelihood of experiencing a new arrest.

6.2.3. Predictive Covariates

[3] There were 2,139 individuals who were released into the community were missing information related to new arrest. For 649 cases, this missing information was the product of censorship (adjudication after the conclusion of the study), but for 1,490 the missing information was the product of an inability determine if the individual was not arrested for a new offense prior to adjudication. This information was assessed and determined to be missing at random and imputed alongside the imputation of new criminal arrest for the detained subsample. A missing case analysis was conducted for the 2,139 individuals, including the production of a missing patterns plot, a missing values map, missing pattern matrix, and a missing case mean comparison evaluation (Zhang, 2015). The primary analyses were replicated listwise deleting the 1,490 cases with missing information on the new arrest measure. These replications produced findings, interpretations, and conclusions that were consistent with all of the results presented in the primary text and supplemental materials. The results of this replication can be provided upon request.

Concerning selection into pretrial detention, due to the non-random missingness associated with *new criminal arrest* – those detained during pretrial could not experience a new criminal arrest – it was important to mitigate the bias associated with this selection process through the employment of observable covariates that (1) directly influence selection into pretrial detention or (2) are correlated with unobserved measures that influence selection into pretrial detention. We believe the identified covariates – alongside the use of random forest imputation – could reduce any potential bias that may exist when forecasting if an individual would have experienced a new criminal arrest if they were released into the community instead of being detained during their entire pretrial period (Kleinberg et al., 2018; Sacks et al., 2015).

Eighteen covariates were introduced into the random forests model to predict if an individual would have experienced a new criminal arrest if they were released into the community instead of being detained during their entire pretrial period. Two dichotomous indicators – assigned bond ("1" = Yes; "0" = No) and assigned ROR ("1" = Yes; "0" = No) – were created to capture court assignment to being assigned bail/bond, released on recognizance, or detained during the entire pretrial period. Three measures were used to capture demographics: (1) Male ("1" = Male; "0" = Female), (2) People of Color ("1" = People of Color; "0" = White)[4], and (3) age at current arrest. Seven measures were used to capture the criminal history of an individual including, pending charges at the time of arrest ("1" = Yes; "0" = No), prior misdemeanor conviction ("1" = Yes; "0" = No), prior felony conviction ("1" = Yes; "0" = No), number of prior violent convictions, number of failure to appears in the past 2 years, number of

[4] Race-Ethnicity of the respondents was contained in a single measure – due to data limitations – broken down into American Indian/Native Alaskan, Asian/Pacific Islander, Black, Hispanic, multiple races, Other, unknown, and White. Despite the number of categories, the small sample sizes for American Indian/Native Alaskan (N = 47), Asian/Pacific Islander (N = 113), Hispanic (N = 99), multiple races (N = 43), Other (N = 63), and unknown (N = 17) made it difficult to dichotomize race/ethnicity into separate categories and forecast new criminal arrests for the detained population. As such, dichotomized by people of color – all individuals of non-European descent – with the reference category being white individuals.

failure to appear more than 2 years ago, and prior incarceration (“1” = Yes; “0” = No). Finally, six measures were created to provide an indication of the current offense including, most serious current charge is a felony offense (“1” = Yes; “0” = current charge misdemeanor), most serious current charge drug (“1” = Yes; “0” = current charge other), most serious current charge property (“1” = Yes; “0” = current charge other), most serious current charge public order (“1” = Yes; “0” = current charge other), most serious current charge violent (“1” = Yes; “0” = current charge other), and days detained in pretrial detention.

6.3. Analytical Strategy

A two-stage analysis was conducted to (1) predict who among the detained subsample would have experienced a new arrest ***if*** they had been released into the community and (2) evaluate the impact of risk-based release relative to judicial decision making on pretrial detention rates and new arrest rates. Briefly, during the process of predicting who among the detained subsample would have experienced a new arrest, missing information on new arrest was imputed for some of the released population (N = 2,139, 11%). A missing case analysis was conducted and suggested that these cases were missing at random. The missing case analysis included the production of a missing patterns plot, a missing values map, missing pattern matrix, and a missing case mean comparison evaluation (Zhang, 2015). A visual evaluation of the missing case patterns and mean comparisons were used to determine that the data were missing at random, following the guidance of the literature (Zhang, 2015). The results of this missing case analysis can be provided upon request.

6.3.1. Forecasting New Arrest for the Detained Subsample

The goal of the current paper is to determine if a risk-based release model could out-perform current court practices for determining if an individual should be released during pretrial. The analyses examine the effects of judicial decision making on new arrests and compare that to various release cutoffs using the NCA scale. New arrest information for the detained subsample is unavailable as these individuals were detained during their entire pretrial period. Evaluating the potential effects of risk-based release, it is necessary to have an idea of who among the detained subsample would have experienced a new arrest ***if*** they were released into the community. We implemented a random forests imputation model to ***forecast*** who among the detained subsample would have experienced a new arrest ***if*** they were released into the community given their scores on the predictive covariates.

Briefly, a random forest is a classification method in which a series of decision trees are created from the available covariates to provide the optimal forecast of an outcome based upon the observable characteristics of a case (Cornelisz et al., 2020; Doove et al., 2014; Shah et al., 2014). A decision tree is a model that predicts a potential outcome value by maximizing cut points through a series of covariates leading to the identification of the most-likely outcome (Breiman, 2001). In the context of a dichotomous outcome, the final leaves represent the assignment of “0” or “1” forecasting if the outcome would have occurred (e.g., new arrest) or if the outcome would not have occurred (e.g., no new arrest). For example, it is possible to follow a decision tree from a root of male or female to a branch of (1) 25 years of age or younger or (2) older than 25 to the assignment of an outcome value – new arrest or no new arrest. A random forest represents the weighted aggregation (i.e., ensemble) of these decision trees, where the forecast of a final value is conditional upon the classification assigned by each tree. The maximization of a random forest is conditional upon the algorithm used to create the forest, but many rely on Breiman’s (2001) original random forest algorithm. For the current study, new arrests for the detained subsample were forecasted using an iteration of the original algorithm adjusted for the potential existence of interaction effects (Doove et al., 2014) through the employment of the MICE package in R (Shah et al., 2014).

While random forests imputation represents the foremost strategy for forecasting non-random missing values, the non-random missingness of new arrest for the detained subsample does present some concerns for the current study (Cornelisz et al., 2020; Shah et al., 2014). That is, judge assignment to bail/bond and being detained causally influenced who was assigned to (1) the released subsample and (2) the detained subsample in the current study. In turn, the non-random assignment of individuals to the released and detained subsamples influenced who *could have* experienced a new arrest (Dhami and van den Brink, 2022). Given this non-random assignment, the implementation of a random forest algorithm could become biased due to the existence of unobservable factors (Cornelisz et al., 2020; Shah et al., 2014). If being detained in jail is conditional upon the existence of a systematic and unobserved mechanism in the courtroom – e.g., everyone with certain tattoos, style of dress, or absence of family members in court is detained during pretrial – than the random forest algorithm could become biased and incorrectly forecast who experienced a new arrest (Shah et al., 2014). However, if all the mechanisms contributing to the assignment of an individual to pretrial detention are observed ***or*** if the systematic and unobserved mechanisms covary with the observed mechanisms, the random forest algorithm will forecast the outcome as expected (Cornelisz et al., 2020; Shah et al., 2014).

In the current context, the random forest forecasts experiencing a new arrest for the detained subsample by establishing a series of decision trees where the univariate distribution of observed new arrests – the released subsample – are split into conditional distributions based upon a recursive binary split of multiple predictors. The process of establishing conditional distributions is executed along the lines of the criteria of the original random forest algorithm developed by Breiman (2001). After establishing the decision trees and, in turn, the random forest, the characteristics of the detained subsample follow the splits along each decision tree into the conditional distributions based upon a recursive binary split of multiple predictors, resulting in the final forecast of not experiencing a new criminal arrest ("0") or experiencing a new criminal arrest ("1"). The final forecast is a weighted aggregation of the conditional distributions an individual is assigned to across all the decision trees.[5]

The random forest imputation model includes 18 covariates to forecast if an individual in the detained subsample would have experienced a new arrest ***if*** they were released into the community. The random forests models include variables accounting for court decisions (i.e., assigned a bail amount, granted ROR), legal factors (i.e., criminal history, current offense), and extralegal factors (i.e., sex, race, and age), all of which appear to be the primary mechanisms influencing pretrial release in the extant literature (Albonetti, 1986; Ayers and Waldfogel, 1994; Scott-Hayward and Fradella, 2019; Spohn, 2008). As such, the forecasting model includes the key covariates associated with pretrial release and limits the potential bias associated with unobservable confounding.

The random forest imputation algorithm was selected because it provides several benefits over alternative forecasting techniques. Random forest imputation is an extension over classification and regression trees (CART) that does not require specific distributional assumptions, accommodates linear, non-linear, and interaction effects, and bootstraps multiple regression trees to prevent overfitting (Shah et al., 2014). An additional benefit of random forest imputation is the ability to use the R package missForest that has been shown to outperform other imputation techniques (Stekhoven and Buhlmann, 2012), and missForest is a practical tool

[5] For a summary of random forests, see VanderPlas, J. (2016). Python data science handbook: Essential tools for working with data. O'Reilly Media, Inc. https://jakevdp.github.io/PythonDataScienceHandbook/05.08-random-forests.html

that researchers may implement with other jurisdictions. Despite the benefits of the random forest imputation algorithm, we conducted a series of sensitivity analyses to validate our primary results. These sensitivity analyses included: (1) matching imputation using nearest neighbor matches with a caliper of .01 and no replacement, (2) classification and regression trees, (3) logistic regression imputation, and (4) lasso logistic regression imputation. The results of these sensitivity analyses are provided as supplemental materials (Appendices A-D), and support the findings and interpretations presented in the main text.

6.3.2 Evaluating the Effectiveness of Risk Based Release

After forecasting who among those in the detained subsample would have experienced a new arrest if they were released into the community, a three-step analytical plan was implemented. First, a comparison was conducted to evaluate if the rate of new arrests for individuals released into the community during pretrial statistically differed from the forecasted rate of new arrests for individuals detained during their entire pretrial period. This comparison was conducted overall and at each score on the NCA scale. Second, rate of new arrests, the reduction in detained and released, and the reduction in new arrests were evaluated by comparing releasing everyone and five risk based release models to current practices (court released). With regards to the risk-based release models, the five iterations evaluated were comparing release and arrest rates for each score of the NCA scale to the release and arrest rates based on judicial decisions. Percent reductions and a mean difference analysis were conducted to evaluate the differences in the rate of new arrests between each of the models. Finally, the post-forecasting comparison of releasing everyone or implementing a risk-based released model to current practices was replicated and stratified by race, focusing on the impact of each release policy for Black and White individuals in the community.[6]

7. Results

7.1. Descriptive Statistics

Table 1 provides the descriptive statistics for the full analytic sample (N = 28,188). As can be seen in table 1, approximately 71 percent of individuals admitted to jails were released during pretrial. Of those released, approximately 22 percent were observed to have experienced a new arrest during the pretrial period (11 percent were missing arrest information due to censorship or an inability to confirm if they experienced a new arrest). The average score on the NCA scale was 2.58, with 26 percent scoring 1, 29 percent scoring 2, 18 percent scoring 3 and 4 (respectively), 6 percent scoring 5, and 2 percent scoring 6. Forty-three percent of individuals in the sample were ordered bail/bond, while 42 percent were directly released, and 15 percent were assigned to be detained during their entire pretrial period. Fifty-one percent of individuals had a prior misdemeanor charge, and on average individuals have been arrested for one violent crime during their lifetime. The analytical sample was 77 percent male and 84 percent People of Color.

***** Insert Table 1 About Here *****

Table 2 offers comparisons between those released into the community at some point during pretrial (n = 19,989) and those detained for their entire pretrial period (n = 8,199). The current release practices result in a released group with lower average NCA scores than the detained group (2.36 v. 3.09, $p < .001$, Cohen's d = 0.28). Although there are significantly higher proportions of each group with NCA scores of 1 and 2 who were released, we found that 37

[6] We focused on Black and White individuals because we were interested in the potential effects of implementing a risk-based released model on the two largest racial groups in the local jurisdiction. Unfortunately, we were unable to conduct the post-forecasting comparison for other race and ethnic groups due to small sample sizes.

percent (n = 3,022) of the detained individuals had an NCA score of 1 or 2. Similarly, there were more individuals with the highest probabilities of being rearrested (NCA scores = 5 and 6) who were released (n = 1,399) than detained (n = 1,229). Despite the importance of prior criminal history in current release practices, we did not find a clear NCA score cutoff for release decisions (e.g., everyone with a certain NCA score is released). The lack of a systematic risk level used for detention decisions suggests there is room to improve decisions that would potentially increase release rates and reduce arrest rates (e.g., release the low scoring detained, detain the high scoring released).

***** Insert Table 2 About Here *****

7.2. Forecasted New Arrests for the Detained Subsample

Using random forest imputation, we forecasted if a detained individual would have experienced a new arrest if they were released into the community. Table 3 provides the proportion of individuals with a new arrest for the released and detained subsamples overall and at each score of the NCA scale and compares those proportions between the two groups. The results of these comparisons demonstrate that the forecasted rate of new arrest for the detained subsample (24 percent) is similar to the rate of new arrest for the released subsample (22 percent). Notably, the difference between the rate of forecasted new arrests for the detained subsample and new arrests for the released subsample appeared to be negligible at each score on the NCA. These findings suggest that despite the observed differences in prior criminal history, the random forest algorithm forecasted that the subsample detained by the court during their pretrial period would have experienced new arrests at a similar rate to those individuals released into the community by the court. These results support our approach to use the forecasted values as plausible counterfactuals to compare decisions made by humans to the assessment.

***** Insert Table 3 About Here *****

7.3. Balancing Release Rates and Arrests Rates

Now that we have forecasted new criminal arrest for the detained subsample (see Table 3), we compare the release and arrest rates between the (actual) current release practices and the alternative outcomes using the six-point NCA scale. Briefly, *court released* decisions represent the current practices of the court for releasing individuals during pretrial and use the actual release and arrest rates for this jurisdiction. The *released by NCA score* represents the risk-based release models and *released everyone* represents what was likely to happen if the court no longer held any individuals in pretrial detention. Looking at Table 4, it can be observed that the court released approximately 71 percent of individuals (n = 19,989) and detained 29 percent (n = 8,199) of individuals admitted to jail. Of the individuals released into the community, 22 percent of them experienced a new arrest, which equated to 4,334 new arrests over the two-year observation period.

In Table 4, we compare the rate and number of individuals for releases and arrests across the NCA scale with those released by the court. The jurisdiction would have a 26 percent release rate (n = 7,284), if all individuals admitted to the jail with an NCA score of 1 were released. Thirteen percent of those released, or 949 individuals, would experience a new criminal arrest, which is a statistically significant but small reduction in the rate of new arrest when compared to current practices ($p < .05$; Cohen's d = -.22). Despite the decrease in the rate and number of new arrests (78 percent reduction in new criminal arrest), releasing only individuals with an NCA score of 1 would result in a 155 percent increase in the number of individuals detained by the court when compared to current practices. A similar pattern of findings was observed if the court only released individuals with an NCA score of 2 or less.

Releasing individuals with an NCA score of 3 or less, however, was associated with a reduction in both the number of individuals detained and the number of new arrests when compared to current practices. If the court released only individuals with an NCA score of 3 or less, 565 more individuals would be released into the community when compared to current practices. This represents approximately a 7 percent reduction in the number of individuals detained when compared to current practices. Despite releasing more individuals into the community, releasing only individuals with an NCA score of 3 or less would result in a 13 percent reduction in new arrests, which is statistically significant but small reduction in the rate of new criminal arrests when compared to current practices ($p < .05$; Cohen's $d = -.08$).

Releasing individuals with NCA scores of 4 or less and of 5 or less results in substantive decreases in the number of individuals detained (69 percent reduction and 92 percent reduction, respectively), but could result in an increase in the number of new arrests. A 24 percent increase (1,057) and a 39 percent increase (1,699 new crimes) in the number of new crimes were observed. Notably, however, despite the substantive increases in the number of new arrests, the rate of new arrests decreased or remained the same when releasing only individuals with NCA scores of 4 or less and of 5 or less (21 percent and 21.9 percent rate of new arrests, respectively). In a similar pattern, releasing everyone during pretrial detention results in 8,199 more individuals being released into the community – when compared to current practices – but will result in 1,984 new arrests to occur (a 46 percent increase in new arrests).

***** Insert Table 4 About Here *****

The replications with only White (Table 5) and Black individuals (Table 6) illustrate a similar pattern as the overall analysis, suggesting that the implementation of a risk-based release model can result in substantive differences in the number of individuals released, the number of individuals detained, the number of new arrests, and the rate of new arrest. Notably, it appears that releasing individuals with an NCA score of 3 or less would result in substantive decreases in the number of individuals detained for White individuals, but nominal decreases in the number of individuals detained for Black individuals when compared to current practices. Despite this, releasing only individuals with an NCA score of 3 or less would result in increases in the number of new arrests for White individuals and decreases in the number of new arrests for Black individuals when compared to current practices. Overall, the findings show that current release practices may be improved if decisions were supported with a risk-based ranking systems.

***** Insert Table 5 and Table 6 About Here *****

8. Discussion

The current study assesses if pretrial release decisions based on the PSA's NCA scale could reduce the number of individuals incarcerated in jail, reduce the number of future arrests, and reduce racial disparities in pretrial detention in comparison to current court release decisions. Three findings from the current study should be highlighted. First, rank ordering and releasing individuals based on the NCA scale can reduce incarceration in comparison to current release practices while potentially maintaining the same or lower arrest rates. Although we recognize that research is needed in other jurisdictions, the findings from the current study suggest that releasing anyone with an NCA score of 3 or lower (73 percent of admitted individuals) could decrease the number of individuals incarcerated by 7 percent and potentially reduce the number of arrests by 13 percent when compared to current release practices. Overall, the findings from the current study suggest that the number of individuals released into the community during pretrial could be increased without decreasing public safety.

Second, the current study contributes to broader understanding of how decisions made by court actors compare to counterfactuals forecasted using decisions made with an assessment. Prior validations consistently demonstrate adequate predictive validity and lack evidence of systematic bias (Desmarais et al., 2021). The purpose for assessments is to inform pretrial release decisions, and validations are necessary to ensure that instruments possess the needed level of predictive validity. Validations, however, tell us little about the potential for assessments to improve decisions. Our findings provide initial evidence of the potential benefits for informing pretrial decisions with assessments.

Third, the findings offer initial evidence to support policy changes to incorporate risk-based decision supports to reduce jail populations. The results of this study suggest the potential for assessments to contribute to pretrial decisions by increasing the number of people released and potentially decreasing the number of new arrests. Specifically, pretrial detention is known to have downstream punitive effects such that the detained are more likely to be convicted and receive harsher sentences (Dobbie et al., 2018; Lowenkamp, 2022). Research shows that pretrial release occurs across the risk distribution with lower risk individuals detained and higher risk individuals released (DeMichele et al., 2023. Although there are several reforms underway looking for opportunities to reduce carceral populations, the current study is one of the few studies to show a potential path forward to decrease detained populations that could have transformative impacts for people cycling through legal systems. Additionally, this strategy could result in taxpayer savings, triage limited jail resources to those most at-risk and need and contribute to decarceration more broadly.

Limitations and Future Directions

The findings from the current study are not without limitations, four of which should be highlighted. First, the results are derived from a single county in a Southeastern state, which limit the generalizability of the findings. Future research should replicate the current study to observe if rules-based release decisions based upon the PSA's NCA scale – or other pretrial assessments – can outperform current release practices in other jurisdictions and other pretrial outcomes (e.g., failure to appear, new violent arrests). Second, although random forests imputation represents the foremost strategy for forecasting non-random events and we employed several sensitivity analyses to support our findings, the individuals detained by court during pretrial were not at risk to experience a new arrest. Consistent with this, and noted throughout the current study, the findings of the current study should not be interpreted as a direct test of release decisions based on pretrial assessments and release decisions based upon court practices. Rather, we used forecasting methods to create a plausible counterfactual for what the detained individuals would have done if released. Future research should make efforts to directly test the effects of release decisions based on pretrial assessments using natural experiments or quasi-experimental techniques. Third, due to data limitations, some factors influential in determining if an individual was detained or released could not be included when forecasting if a detained individual would experience a new criminal arrest. Future research should include additional measures (e.g., financial status, gang affiliation) when predicting if a detained individual would experience a new criminal arrest. Fourth, our data are limited to race that does not include a code for ethnicity, and the dataset did not allow for more detailed analyses across multiple racial groups due to small sample size. We encourage future research to test these findings for people across race and ethnic groups.

Conclusion

Mass incarceration is one of the most enduring social problems in the U.S. The causes and consequences of the overuse of incarceration have had devastating impacts on society and especially people of color. Pretrial incarceration is a contributor of mass incarceration (Zeng, 2022) its use is unlikely to deliver on the touted public safety benefits as pretrial incarceration is associated with lower court attendance rates, higher rearrest rates, and higher conviction rates (Dobbie et al., 2018; Lowenkamp, 2022). There are several criminal justice reform efforts underway across the country to reduce jail populations that are looking for effective strategies to release more people without affecting public safety. Initially, pretrial assessments were seen as an improvement that could decrease jail populations and shorten length of stay in jail. The optimism for pretrial assessments to improve pretrial decisions quickly faded in the face of claims of racial bias (Angwin et a., 2016). A growing body of validation and bias testing research has emerged to respond to the critiques with empirical studies demonstrating a lack of evidence to support claims of predictive bias (Desmarais et al., 2021; Lowenkamp et al., 2022).

Identifying valid and nonbiased instruments is an essential first step to develop assessments. Conducting prediction in the real world is about more than high predictive validity. Rather, it is paramount to develop valid and unbiased tools that can improve real world decision making. There is general agreement that the U.S. has an unhealthy reliance on incarceration such that we overincarcerate people for a host of unwanted behaviors and social problems. Unfortunately, mass pretrial incarceration likely exacerbates the problems we are trying to reduce. Our findings demonstrate that pretrial assessments have the potential to improve court decision making. This is not to suggest the last word on assessments. Rather, the findings are plausible given the mountain of behavioral economic findings that have routinely shown that even high-stakes decisions are predicated on intuitive decision-making faculties (Thaler, 2016) and post-assessment validations finding reductions in pretrial outcomes (e.g., new arrests) and jail populations (Lowenkamp et al., 2022). The decision-making literature has made clear that humans make a series of systematic errors due to weak assessment of base rates, limited understanding of probabilities of outcomes, and poor understanding of the influence of irrelevant information (e.g., mood, context).

The current study contributes to a larger body of research demonstrating the importance of identifying strategies to reduce the reliance on pretrial incarceration. Our results illustrate that assessment-based decisions have the potential to contribute to current release practices that might increase releases and reduce new arrests. The approach used here could be used by jurisdictions considering implementing an assessment to gauge the potential benefits prior to implementation. We encourage future research to scrutinize our findings with the intentions of assessing their generalizability and finding approaches to improve decision making. This study contributes substantively to the sociology of punishment, and our findings can support broader research and policy development on areas affecting societies most vulnerable.

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Tables and Figures

Table 1.
Full Sample Descriptive Statistics (N = 28,188)

	N-Missing	Mean (%)	SD	Min	Max
Pretrial Release	0	(71%)	--	0	1
New Arrest ($N_{released}$ = 19,989)	2,139	(22%)		0	1
NCA Scale	0	2.58	1.34	1	6
Score 1	0	(26%)	--	0	1
Score 2	0	(29%)	--	0	1
Score 3	0	(18%)	--	0	1
Score 4	0	(18%)	--	0	1
Score 5	0	(6%)	--	0	1
Score 6	0	(2%)	--	0	1
Predictive Covariates					
Assigned Bond	179	(43%)	--	0	1
Assigned ROR	179	(42%)	--	0	1
Assigned Detained	179	(15%)	--	0	1
Age at Current Arrest	0	34.49	11.92	18	84
Pending Charge	0	(15%)	--	0	1
Prior Misdemeanor Conviction	0	(51%)	--	0	1
Prior Felony Conviction	0	(34%)	--	0	1
# Prior Violent Conviction	0	1.22	2.89	0	49
# Prior FTA (2-years)	0	0.42	0.85	0	12
# Prior FTA (More than 2-years)	0	0.86	1.90	0	22
Prior Incarceration	0	(26%)	--	0	1
Current Charge Felony	0	(53%)	--	0	1
Current Charge Misdemeanor (ref)	0	(47%)	--	0	1
Current Drug Charge	0	(18%)	--	0	1
Current Property Charge	0	(29%)	--	0	1
Current Public Order Charge	0	(10%)	--	0	1
Current Violent Charge	0	(34%)	--	0	1
Current Other Charge (ref)	0	(8%)	--	0	1
Male	3	(77%)	--	0	1
Female	3	(23%)	--	0	1
People of Color	0	(84%)	--	0	1
White	0	(16%)	--	0	1
Days Detained	173	30.35	77.79	1	992

Table 2:
Pre- Forecasting Mean Comparison of Those Released to Those Detained.

	Released (N = 19,989)		Detained (N = 8,199)			
	Mean (%)	SD	Mean (%)	SD	*t-value*	Cohen's *d*
NCA Score	2.36	1.26	3.09	1.40	40.94	0.56
Score 1	(30%)	--	(16%)	--	-27.44	-0.33
Score 2	(32%)	--	(21%)	--	-19.54	-0.24
Score 3	(17%)	--	(20%)	--	7.12	0.10
Score 4	(15%)	--	(27%	--	21.98	0.32
Score 5	(5%)	--	(11%)	--	17.49	0.27
Score 6	(2%)	--	(4%)	--	11.38	0.18
Predictive Covariates						
Assigned Bond	(41%)	--	(49%)	--	12.53	0.17
Assigned ROR	(59%)	--	(0%)	--	-167.91	-1.42
Age at Current Arrest	33.61	11.57	36.63	12.47	18.84	0.25
Pending Charge	(13%)	--	(19%)	--	12.05	0.17
Prior Misdemeanor Conviction	(45%)	--	(66%)	--	33.26	0.43
Prior Felony Conviction	(27%)	--	(50%)	--	36.17	0.50
# Prior Violent Crime Conviction	0.85	2.32	2.13	3.81	28.33	0.45
# Prior FTA (2-years)	0.36	0.78	0.56	0.99	16.60	0.24
# Prior FTA (More than 2-years)	0.66	1.63	1.34	2.36	24.00	0.36
Prior Incarceration	(19%)	--	(41%)	--	35.27	0.51
Current Charge Felony	(53%)	--	(53%)	--	-1.11	-0.01
Current Drug Charge	(19%)	--	(15%)	--	-7.80	-0.10
Current Property Charge	(28%)	--	(31%)	--	4.95	0.07
Current Public Order Charge	(9%)	--	(12%)	--	6.33	0.09
Current Violent Charge	(34%)	--	(35%)	--	1.88	0.02
Male	(73%)	--	(85%)	--	23.50	0.28
People of Color	(83%)	--	(85%)	--	4.57	0.06
Days Detained	11.60	33.14	77.04	123.83	46.68	0.91

Notes: Although it is common for individuals to define $t = +1.96$ or $t = -1.96$ ($p < .05$) as the critical region for the difference between two groups, we recommend interpreting the difference between the groups based upon the magnitude of the difference (Cohen’s *d*). If it is necessary to define statistically significant differences, we would recommend defining the critical region as $t = +2.58$ or $t = -2.58$ ($p < .01$) due to the sample size.

Table 3:
Post-Forecasting Number of Cases and Percent Experiencing a New Arrest by NCA Score and Detention Status.

	Released (Total N = 19,898)		Detained (Total N = 8,199)			
	N	%	N	%	*t-value*	Cohen's *d*
New Arrest	4,334	22%	1,984	24%	4.53	0.06
NCA Score (Percent Experiencing a New Arrest)						
Score 1	769	13%	180	14%	1.02	0.03
Score 2	1,263	20%	293	17%	-2.78	-0.07
Score 3	868	26%	396	24%	-1.78	-0.05
Score 4	945	32%	677	31%	-1.04	-0.03
Score 5	346	38%	296	32%	-2.60	-0.12
Score 6	143	43%	142	39%	-1.08	-0.08

Notes: New arrests for the detained subsample represent the forecasted occurrence of new arrests, while new arrests for the released subsample represents the observed new arrests after imputing new arrest for 2,139 released individuals.

Table 4:
Forecasting the Effects of Different Release Techniques on the Predicted Rate of New Arrest.

					Of Released		Comparison to Court Release					
	N Released	% Released	N Detained	% Detained	New Arrest	% New Arrest	Reduction in Detained	% Reduction in Detained	Reduction in New Arrest	% Reduction in New Arrest	*t-test* (New Arrest Rate)	Cohen's *d* (New Arrest Rate)
Reason for Release												
Court Released	19,989	70.9%	8,199	29.1%	4334	21.7%	--	--	--	--	--	--
Released by NCA Score												
NCA score of 1	7,284	25.8%	20,904	74.2%	949	13.0%	12,705	155.0%	-3,385	-78.1%	-17.64	-0.22
NCA score of 2 or less	15,516	55.0%	12,672	45.0%	2505	16.1%	4,473	54.6%	-1,829	-42.2%	-13.34	-0.14
NCA score of 3 or less	20,554	72.9%	7,634	27.1%	3769	18.3%	-565	-6.9%	-565	-13.0%	-8.42	-0.08
NCA score of 4 or less	25,674	91.1%	2,514	8.9%	5391	21.0%	-5,685	-69.3%	1,057	24.4%	-1.77	-0.02
NCA score of 5 or less	27,488	97.5%	700	2.5%	6033	21.9%	-7,499	-91.5%	1,699	39.2%	0.69	0.01
Released Everyone												
Released Everyone	28,188	100.0%	0	0.0%	6318	22.4%	-8199	-100.0%	1,984	45.8%	1.91	0.02

Table 5:
Forecasting the Effects of Different Release Techniques on the Predicted Rate of New Arrest (White Individual Only).

					Of Released		**Comparison to Court Release**					
	N Released	% Released	N Detained	% Detained	New Arrest	% New Arrest	Reduction in Detained	% Reduction in Detained	Reduction in New Arrest	% Reduction in New Arrest	*t-test* (New Arrest Rate)	Cohen's *d* (New Arrest Rate)
Reason for Release												
Court Released	3,330	73.7%	1190	26.3%	613	18.4%	--	--	--	--	--	--
Released by NCA Score												
NCA score of 1	1,575	34.8%	2945	65.2%	173	11.0%	1,755	147.5%	-440	-71.8%	-7.17	-0.20
NCA score of 2 or less	3,061	67.7%	1459	32.3%	436	14.2%	269	22.6%	-177	-28.9%	-4.52	-0.11
NCA score of 3 or less	3,829	84.7%	691	15.3%	633	16.5%	-499	-41.9%	20	3.3%	-2.08	-0.05
NCA score of 4 or less	4,319	95.6%	201	4.4%	785	18.2%	-989	-83.1%	172	28.1%	-0.26	-0.01
NCA score of 5 or less	4,477	99.0%	43	1.0%	842	18.8%	-1,147	-96.4%	229	37.4%	0.45	0.01
Released Everyone												
Released Everyone	4,520	100.0%	0	0.0%	858	19.0%	-1,190	-100.0%	245	40.0%	0.65	0.01

Table 6:
Forecasting the Effects of Different Release Techniques on the Predicted Rate of New Arrest (Black Individual Only).

					Of Released		Comparison to Court Release					
	N Released	% Released	N Detained	% Detained	New Arrest	% New Arrest	Reduction in Detained	% Reduction in Detained	Reduction in New Arrest	% Reduction in New Arrest	*t-test* (New Arrest Rate)	Cohen's d (New Arrest Rate)
Reason for Release												
Court Released	16,378	70.3%	6,908	29.7%	3,697	22.6%	--	--	--	--	--	--
Released by NCA Score												
NCA score of 1	5,514	23.7%	17,772	76.3%	761	13.8%	10,864	157.3%	-2,936	-79.4%	-15.45	-0.22
NCA score of 2 or less	12,146	52.2%	11,140	47.8%	2,041	16.8%	4,232	61.3%	-1,656	-44.8%	-12.25	-0.14
NCA score of 3 or less	16,380	70.3%	6,906	29.7%	3,097	18.9%	-2	0.0%	-600	-16.2%	-8.19	-0.09
NCA score of 4 or less	20,984	90.1%	2,302	9.9%	4,564	21.7%	-4,606	-66.7%	867	23.5%	-1.90	-0.02
NCA score of 5 or less	22,633	97.2%	653	2.8%	5,146	22.7%	-6,255	-90.5%	1,449	39.2%	0.38	0.00
Released Everyone												
Released Everyone	23,286	100.0%	0	0.0%	5,413	23.2%	-6,908	-100.0%	1,716	46.4%	1.57	0.02

Supplemental Materials
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Appendix A: Pre-Matching and Post-Matching Balance Evaluation

Table A1:
Correlated Traits Path Model used to Predict Experiencing a New Arrest.

	Regression Models					
	b	SE	*p-value*	95% CI Lower	95% CI Lower	β
New Arrest						
Bond	0.057	0.017	0.001	0.025	0.090	0.082
Released on Own Recognizance	-0.050	0.015	0.001	-0.079	-0.021	-0.067
Age at Current Arrest	-1.879	0.108	0.000	-2.091	-1.668	-0.206
Pending Charge	0.283	0.032	0.000	0.221	0.345	0.093
Prior Misdemeanor Charge	0.317	0.027	0.000	0.265	0.370	0.146
Prior Felony Charge	0.127	0.034	0.000	0.061	0.193	0.055
Prior Violent Charge	0.033	0.005	0.000	0.023	0.043	0.088
Failure to Appear Last 2-Years	0.033	0.017	0.051	0.000	0.066	0.026
Failure to Appear More Than 2-Years	0.036	0.007	0.000	0.022	0.050	0.063
Prior Incarceration	0.108	0.038	0.004	0.034	0.181	0.043
Most Serious Charge Felony	0.102	0.045	0.024	0.014	0.190	0.047
Most Serious Charge Drug	0.364	0.065	0.000	0.236	0.491	0.129
Most Serious Charge Property	0.584	0.056	0.000	0.475	0.694	0.245
Most Serious Charge Public	0.295	0.060	0.000	0.178	0.412	0.082
Most Serious Charge Violent	0.545	0.065	0.000	0.418	0.672	0.238
Male	0.150	0.026	0.000	0.099	0.201	0.059
People of Color	0.005	0.031	0.875	-0.056	0.066	0.002
Days Detained in Pretrial Detention	0.054	0.044	0.218	-0.032	0.141	0.039
Failure to Appear						
Bond	0.038	0.018	0.032	0.003	0.073	0.054
Released on Own Recognizance	-0.032	0.016	0.042	-0.063	-0.001	-0.042
Age at Current Arrest	-0.453	0.113	0.000	-0.675	-0.231	-0.050
Pending Charge	0.344	0.033	0.000	0.279	0.409	0.113
Prior Misdemeanor Charge	0.205	0.030	0.000	0.146	0.263	0.094
Prior Felony Charge	0.063	0.037	0.087	-0.009	0.136	0.028
Prior Violent Charge	0.021	0.005	0.000	0.010	0.031	0.055
Failure to Appear Last 2-Years	0.118	0.017	0.000	0.084	0.152	0.092
Failure to Appear More Than 2-Years	0.034	0.008	0.000	0.019	0.049	0.059
Prior Incarceration	0.065	0.040	0.107	-0.014	0.145	0.026
Most Serious Charge Felony	0.338	0.049	0.000	0.243	0.434	0.155
Most Serious Charge Drug	0.399	0.072	0.000	0.259	0.540	0.142
Most Serious Charge Property	0.567	0.062	0.000	0.445	0.689	0.237
Most Serious Charge Public	0.225	0.068	0.001	0.092	0.358	0.062
Most Serious Charge Violent	0.362	0.072	0.000	0.221	0.503	0.157
Male	0.028	0.029	0.323	-0.028	0.084	0.011
People of Color	-0.002	0.035	0.950	-0.070	0.066	-0.001
Days Detained in Pretrial Detention	0.187	0.039	0.000	0.111	0.264	0.134
New Violent Criminal Arrest						
Bond	-0.019	0.022	0.380	-0.062	0.023	-0.028
Released on Own Recognizance	0.020	0.020	0.313	-0.019	0.058	0.027
Age at Current Arrest	-1.648	0.153	0.000	-1.948	-1.348	-0.184
Pending Charge	0.147	0.043	0.001	0.063	0.232	0.049
Prior Misdemeanor Charge	0.271	0.037	0.000	0.198	0.344	0.127
Prior Felony Charge	0.012	0.045	0.797	-0.077	0.100	0.005
Prior Violent Charge	0.053	0.006	0.000	0.041	0.065	0.144
Failure to Appear Last 2-Years	0.005	0.023	0.842	-0.040	0.049	0.004
Failure to Appear More Than 2-Years	0.003	0.010	0.743	-0.016	0.023	0.006
Prior Incarceration	0.096	0.050	0.054	-0.001	0.193	0.039
Most Serious Charge Felony	-0.192	0.060	0.001	-0.309	-0.074	-0.090
Most Serious Charge Drug	0.042	0.096	0.664	-0.146	0.230	0.015
Most Serious Charge Property	0.328	0.081	0.000	0.169	0.488	0.140
Most Serious Charge Public	0.279	0.088	0.002	0.106	0.451	0.078
Most Serious Charge Violent	0.482	0.091	0.000	0.304	0.660	0.214
Male	0.104	0.036	0.004	0.033	0.174	0.041
People of Color	0.157	0.046	0.001	0.066	0.249	0.054

Days Detained in Pretrial Detention	0.041	0.063	0.511	-0.082	0.165	0.030
Bond						
Age at Current Arrest	0.010	0.087	0.906	-0.160	0.180	0.001
Pending Charge	0.028	0.027	0.307	-0.025	0.080	0.006
Prior Misdemeanor Charge	0.041	0.024	0.085	-0.006	0.088	0.013
Prior Felony Charge	0.057	0.029	0.048	0.000	0.114	0.017
Prior Violent Charge	0.004	0.004	0.337	-0.004	0.011	0.007
Failure to Appear Last 2-Years	0.066	0.013	0.000	0.041	0.091	0.036
Failure to Appear More Than 2-Years	0.012	0.006	0.048	0.000	0.023	0.014
Prior Incarceration	0.041	0.031	0.193	-0.021	0.103	0.012
Most Serious Charge Felony	-1.777	0.021	0.000	-1.819	-1.735	-0.572
Most Serious Charge Drug	-1.464	0.078	0.000	-1.618	-1.311	-0.365
Most Serious Charge Property	-1.000	0.075	0.000	-1.147	-0.852	-0.293
Most Serious Charge Public	-0.914	0.080	0.000	-1.071	-0.757	-0.177
Most Serious Charge Violent	-1.977	0.074	0.000	-2.121	-1.832	-0.604
Male	0.018	0.023	0.433	-0.027	0.062	0.005
People of Color	0.063	0.026	0.015	0.012	0.114	0.015
Released on Own Recognizance						
Age at Current Arrest	0.016	0.083	0.844	-0.147	0.180	0.001
Pending Charge	-0.012	0.026	0.651	-0.062	0.039	-0.003
Prior Misdemeanor Charge	-0.027	0.023	0.230	-0.071	0.017	-0.009
Prior Felony Charge	-0.137	0.027	0.000	-0.190	-0.084	-0.045
Prior Violent Charge	-0.019	0.004	0.000	-0.026	-0.011	-0.037
Failure to Appear Last 2-Years	-0.169	0.012	0.000	-0.192	-0.145	-0.099
Failure to Appear More Than 2-Years	-0.015	0.006	0.012	-0.026	-0.003	-0.019
Prior Incarceration	-0.085	0.029	0.004	-0.142	-0.027	-0.026
Most Serious Charge Felony	1.443	0.021	0.000	1.401	1.484	0.499
Most Serious Charge Drug	1.388	0.078	0.000	1.235	1.541	0.371
Most Serious Charge Property	0.978	0.076	0.000	0.829	1.128	0.308
Most Serious Charge Public	0.637	0.081	0.000	0.477	0.797	0.133
Most Serious Charge Violent	1.705	0.075	0.000	1.558	1.852	0.559
Male	-0.060	0.022	0.007	-0.104	-0.017	-0.018
People of Color	-0.049	0.025	0.052	-0.098	0.000	-0.012

Covariances

	Cov	SE	*p-value*	95% CI Lower	95% CI Lower	Standardized Cov
New Arrest						
Failure to Appear	0.518	0.013	0.000	0.493	0.543	0.520
New Violent Criminal Arrest	1.000	0.571	0.080	-0.118	2.119	1.004
Failure to Appear						
New Violent Criminal Arrest	0.302	0.020	0.000	0.264	0.341	0.303
N			27,945			

Notes: The path model was estimated using the DWLS estimator in Lavaan with pairwise deletion.

Table A2:
Pre-Matching Comparison of Those Released to Those Detained.

	Released (N = 17,755)		Detained (N = 7,957)			
	Mean (%)	SD	Mean (%)	SD	*t-value*	Cohen's *d*
PSA						
NCA Score	2.30	1.24	3.10	1.40	-43.90	-0.62
Score 1	31%	--	16%	--	29.13	0.36
Score 2	33%	--	21%	--	20.69	0.26
Score 3	16%	--	21%	--	-7.85	-0.11
Score 4	14%	--	27%	--	-23.57	-0.35
Score 5	4%	--	11%	--	-18.77	-0.30
Score 6	1%	--	4%	--	-12.18	-0.20
Predicting NCA						
NCA	22%	--	--	--	--	--
Predicted Probability of NCA	.34		.40		-46.86	-0.69
Matching Covariates						
Assigned Bond	42%	--	50%	--	-11.97	-0.16
Assigned ROR	58%	--	0%	--	155.29	1.41
Age at Current Arrest	33.68	0.12	36.73	0.12	-18.53	-0.26
Pending Charge						
Prior Misdemeanor	43%	--	66%	--	-35.76	-0.47
Prior Felony	25%	--	51%	--	-38.80	-0.55
# Prior Violent Crime	0.79	2.23	2.15	3.84	-29.50	-0.48
# Prior FTA (2-years)	0.35	0.77	0.56	0.99	-16.84	-0.25
# Prior FTA (More than 2-years)	0.63	1.58	1.35	2.35	-25.20	-0.39
Prior Incarceration	18%	--	41%	--	-36.79	-0.54
Current Charge Felony	51%	--	52%	--	-1.05	-0.01
Drug Charge	19%	--	16%	--	6.15	0.08
Property Charge	28%	--	32%	--	-6.60	-0.09
Public Order Charge	9%	--	12%	--	-7.03	-0.10
Violent Charge	34%	--	34%	--	0.64	0.01
Male	72%	--	85%	--	-24.40	0.30
People of Color	83%	--	86%	--	-4.38	-0.06
Days Detained	9.09	26.74	77.38	124.14	-48.57	-0.94

Table A3:
Post-Matching and Prediction Comparison of Those Released to Those Detained (Matched Subsample).

	Released (N = 7,097)		Detained (N = 7,097)			
	Mean (%)	SD	Mean (%)	SD	*t-value*	Cohen's *d*
PSA						
NCA Score	2.80	1.31	2.95	1.36	-6.64	-0.11
Score 1	17%	--	18%	--	-0.13	0.00
Score 2	30%	--	23%	--	8.71	0.15
Score 3	21%	--	22%	--	-1.23	-0.02
Score 4	22%	--	25%	--	-4.10	-0.07
Score 5	7%	--	9%	--	-4.69	-0.08
Score 6	3%	--	3%	--	-1.56	-0.03
Predicting NCA						
NCA	27%	--	27%	--	--	--
Predicted Probability of NCA	.38		.38		0.00	0.00
Matching Covariates						
Assigned Bond	43%	--	52%	--	-11.08	-0.19
Assigned ROR	57%	--	0%	--	96.30	1.62
Age at Current Arrest	33.85	11.16	37.14	12.73	-16.37	-0.27
Pending Charge						
Prior Misdemeanor	64%	--	62%	--	2.14	0.04
Prior Felony	42%	--	46%	--	-4.01	-0.07
# Prior Violent Crime	1.48	3.03	1.62	2.98	-2.89	-0.05
# Prior FTA (2-years)	0.41	0.84	0.53	0.94	-8.09	-0.14
# Prior FTA (More than 2-years)	1.12	2.11	1.12	2.03	-0.10	0.00
Prior Incarceration	31%	--	37%	--	-6.62	-0.11
Current Charge Felony	56%	--	48%	--	9.88	0.17
Drug Charge	18%	--	17%	--	2.45	0.04
Property Charge	32%	--	31%	--	1.26	0.02
Public Order Charge	8%	--	13%	--	-9.16	-0.15
Violent Charge	35%	--	32%	--	3.57	0.06
Male	79%	--	83%	--	-6.49	-0.11
People of Color	85%	--	85%	--	0.51	0.01
Days Detained	12.67	33.21	66.97	112.10	-39.13	-0.66

Table A4:
Post-Forecasting Number of Cases and Percent Experiencing a New Arrest By NCA Score and Detention Status.

	Released (Total N = 17,755)		Detained (Total N = 7,097)			
	N	%	N	%	*t-value*	Cohen's *d*
New Arrest	3845	22%	1946	27%	9.40	.14
NCA (Percent Experiencing A New Arrest)						
Score 1	717	13%	223	18%	4.24	0.14
Score 2	1147	19%	380	23%	2.93	0.08
Score 3	776	27%	410	27%	-0.10	-0.00
Score 4	799	33%	599	34%	0.92	0.03
Score 5	291	40%	240	36%	-1.72	-0.09
Score 6	115	45%	94	40%	-0.98	-0.09

Notes: New arrests for the detained subsample represent the forecasted occurrence of new arrests, while new arrests for the released subsample represents the observed new arrests.

Table A5:
Forecasting the Effects of Different Release Techniques on the Predicted Rate of New Arrest.

					Of Released		**Comparison to Court Release**					
	N Released	% Released	N Detained	% Detained	New Arrest	% New Arrest	Reduction in Detained	% Reduction in Detained	Reduction in New Arrest	% Reduction in New Arrest	*t-test* (New Arrest Rate)	Cohen's *d* (New Arrest Rate)
Reason for Release												
Court Released	17,755	71.4%	7,097	28.6%	3,845	21.7%	--	--	--	--	--	--
Released by NCA Score												
NCA score of 1	6,800	27.4%	18,052	72.6%	940	13.8%	10,955	154.4%	-2,905	-75.6%	-15.05	-0.20
NCA score of 2 or less	14,363	57.8%	10,489	42.2%	2,467	17.2%	3,392	47.8%	-1,378	-35.8%	-10.15	-0.11
NCA score of 3 or less	18,806	75.7%	6,046	24.3%	3,653	19.4%	-1,051	-14.8%	-192	-5.0%	-5.28	-0.06
NCA score of 4 or less	22,978	92.5%	1,874	7.5%	5,051	22.0%	-5,223	-73.6%	1,206	31.4%	0.79	0.01
NCA score of 5 or less	24,362	98.0%	490	2.0%	5,582	22.9%	-6,607	-93.1%	1,737	45.2%	3.07	0.03
Released Everyone												
Released Everyone	24,852	100.0%	0	0.0%	5,791	23.3%	-7,097	-100.0%	1,946	50.6%	4.02	0.04

Table A6:
Forecasting the Effects of Different Release Techniques on the Predicted Rate of New Arrest (White Individuals Only).

					Of Released		Comparison to Court Release					
	N Released	% Released	N Detained	% Detained	New Arrest	% New Arrest	Reduction in Detained	% Reduction in Detained	Reduction in New Arrest	% Reduction in New Arrest	*t-test* (New Arrest Rate)	Cohen's *d* (New Arrest Rate)
Reason for Release												
Court Released	2,946	72.8%	1,098	27.2%	543	18.4%	--	--	--	--	--	--
Released on NCA Score												
NCA score of 1	1,457	36.0%	2,587	64.0%	158	10.8%	1,489	135.6%	-385	-70.9%	-7.00	-0.21
NCA score of 2 or less	2,796	69.1%	1,248	30.9%	413	14.8%	150	13.7%	-130	-23.9%	-3.73	-0.10
NCA score of 3 or less	3,469	85.8%	575	14.2%	595	17.2%	-523	-47.6%	52	9.6%	-1.33	-0.03
NCA score of 4 or less	3,881	96.0%	163	4.0%	717	18.5%	-935	-85.2%	174	32.0%	0.05	0.00
NCA score of 5 or less	4,009	99.1%	35	0.9%	765	19.1%	-1,063	-96.8%	222	40.9%	0.69	0.02
Released Everyone												
Released Everyone	4,044	100.0%	0	0.0%	778	19.2%	-1,098	-100.0%	235	43.3%	0.85	0.02

Table A7:
Forecasting the Effects of Different Release Techniques on the Predicted Rate of New Arrest (Black Individual Only).

					Of Released		**Comparison to Court Release**					
	N Released	% Released	N Detained	% Detained	New Arrest	% New Arrest	Reduction in Detained	% Reduction in Detained	Reduction in New Arrest	% Reduction in New Arrest	*t-test* (New Arrest Rate)	Cohen's *d* (New Arrest Rate)
Reason for Release												
Court Released	14,557	71.1%	5,905	28.9%	3,845	26.4%	--	--	--	--	--	--
Released on NCA Score												
NCA score of 1	5,162	25.2%	15,300	74.8%	764	14.8%	9,395	159.1%	-3,081	-80.1%	-12.84	-0.19
NCA score of 2 or less	11,285	55.2%	9,177	44.8%	2,023	17.9%	3,272	55.4%	-1,822	-47.4%	-9.25	-0.11
NCA score of 3 or less	15,024	73.4%	5,438	26.6%	3,022	20.1%	-467	-7.9%	-823	-21.4%	-5.12	-0.06
NCA score of 4 or less	18,760	91.7%	1,702	8.3%	4,295	22.9%	-4,203	-71.2%	450	11.7%	0.74	0.01
NCA score of 5 or less	20,010	97.8%	452	2.2%	4,776	23.9%	-5,453	-92.3%	931	24.2%	2.86	0.03
Released Everyone												
Released Everyone	20,462	100.0%	0	0.0%	4,971	24.3%	-5,905	-100.0%	1,126	29.3%	3.80	0.04

Appendix B: Sensitivity Analysis Using CART Imputation

Table B1:
Post-Forecasting Number of Cases and Percent Experiencing a New Arrest By NCA Score and Detention Status.

	New Arrest					
	Released (Total N = 19,898)		Detained (Total N = 8,199)			
	N	%	N	%	*t-value*	Cohen's *d*
New Arrest	4,540	23%	2,879	35%	20.51	0.28
NCA (Percent Experiencing A New Arrest)						
Score 1 (New Arrest)	817	14%	313	24%	8.30	0.29
Score 2 (New Arrest)	1,288	20%	518	29%	8.02	0.23
Score 3 (New Arrest)	916	27%	579	34%	5.16	0.16
Score 4 (New Arrest)	994	34%	885	40%	4.73	0.13
Score 5 (New Arrest)	380	42%	398	44%	0.69	0.03
Score 6 (New Arrest)	145	43%	186	51%	1.96	0.15

Notes: New arrests for the detained subsample represent the forecasted occurrence of new arrests, while new arrests for the released subsample represents the observed new arrests after imputing new arrest for 2,139 released individuals.

Table B2:
Forecasting the Effects of Different Release Techniques on the Predicted Rate of New Arrest.

					Of Released		Comparison to Court Release					
	N Released	% Released	N Detained	% Detained	New Arrest	% New Arrest	Reduction in Detained	% Reduction in Detained	Reduction in New Arrest	% Reduction in New Arrest	*t-test* (New Arrest Rate)	Cohen's *d* (New Arrest Rate)
Reason for Release												
Court Released	19,989	70.9%	8,199	29.1%	4,540	22.7%	--	--	--	--	--	--
Released by NCA Score												
NCA score of 1	7,284	25.8%	20,904	74.2%	1,130	15.5%	12,705	155.0%	-3,410	-75.1%	-13.91	-0.18
NCA score of 2 or less	15,516	55.0%	12,672	45.0%	2,936	18.9%	4,473	54.6%	-1,604	-35.3%	-8.77	-0.09
NCA score of 3 or less	20,554	72.9%	7,634	27.1%	4,431	21.6%	-565	-6.9%	-109	-2.4%	-2.80	-0.03
NCA score of 4 or less	25,674	91.1%	2,514	8.9%	6,310	24.6%	-5,685	-69.3%	1,770	39.0%	4.66	0.04
NCA score of 5 or less	27,488	97.5%	700	2.5%	7,088	25.8%	-7,499	-91.5%	2,548	56.1%	7.75	0.07
Released Everyone												
Released Everyone	28,188	100.0%	0	0.0%	7,419	26.3%	-8,199	-100.0%	2,879	63.4%	9.11	0.08

Table B3:
Forecasting the Effects of Different Release Techniques on the Predicted Rate of New Arrest (White Individual Only).

					Of Released		**Comparison to Court Release**					
	N Released	% Released	N Detained	% Detained	New Arrest	% New Arrest	Reduction in Detained	% Reduction in Detained	Reduction in New Arrest	% Reduction in New Arrest	*t-test* (New Arrest Rate)	Cohen's *d* (New Arrest Rate)
Reason for Release												
Court Released	3,330	73.7%	1,190	26.3%	667	20.0%	--	--	--	--	--	--
Released by NCA Score												
NCA score of 1	1,575	34.8%	2,945	65.2%	211	13.4%	1,755	147.5%	-456	-68.4%	-6.01	-0.17
NCA score of 2 or less	3,061	67.7%	1,459	32.3%	551	18.0%	269	22.6%	-116	-17.4%	-2.07	-0.05
NCA score of 3 or less	3,829	84.7%	691	15.3%	784	20.5%	-499	-41.9%	117	17.5%	0.47	0.01
NCA score of 4 or less	4,319	95.6%	201	4.4%	970	22.5%	-989	-83.1%	303	45.4%	2.58	0.06
NCA score of 5 or less	4,477	99.0%	43	1.0%	1,040	23.2%	-1,147	-96.4%	373	55.9%	3.41	0.08
Released Everyone												
Released Everyone	4,520	100.0%	0	0.0%	1,059	23.4%	-1,190	-100.0%	392	58.8%	3.63	0.08

Table B4:
Forecasting the Effects of Different Release Techniques on the Predicted Rate of New Arrest (Black Individual Only).

					Of Released		**Comparison to Court Release**					
	N Released	% Released	N Detained	% Detained	New Arrest	% New Arrest	Reduction in Detained	% Reduction in Detained	Reduction in New Arrest	% Reduction in New Arrest	*t-test* (New Arrest Rate)	Cohen's *d* (New Arrest Rate)
Reason for Release												
Court Released	16,378	70.3%	6,908	29.7%	3846	23.5%	--	--	--	--	--	--
Released by NCA Score												
NCA score of 1	5,514	23.7%	17,772	76.3%	898	16.3%	10,864	157.3%	-2,948	-76.7%	-12.04	-0.18
NCA score of 2 or less	12,146	52.2%	11,140	47.8%	2,348	19.3%	4,232	61.3%	-1,498	-38.9%	-8.51	-0.10
NCA score of 3 or less	16,380	70.3%	6,906	29.7%	3,599	22.0%	-2	0.0%	-247	-6.4%	-3.26	-0.04
NCA score of 4 or less	20,984	90.1%	2,302	9.9%	5,284	25.2%	-4,606	-66.7%	1,438	37.4%	3.80	0.04
NCA score of 5 or less	22,633	97.2%	653	2.8%	5,990	26.5%	-6,255	-90.5%	2,144	55.7%	6.74	0.07
Released Everyone												
Released Everyone	23,286	100.0%	0	0.0%	6,300	27.1%	-6,908	-100.0%	2454	63.8%	8.10	0.08

Appendix C: Sensitivity Analysis Using Lasso Logistic Imputation

Table C1:
Post-Forecasting Number of Cases and Percent Experiencing a New Arrest By NCA Score and Detention Status.

	New Arrest					
	Released (Total N = 19,898)		Detained (Total N = 8,199)			
	N	%	N	%	*t-value*	Cohen's *d*
New Arrest	4,497	22%	2,419	30%	12.00	0.16
NCA (Percent Experiencing A New Arrest)						
Score 1	783	13%	196	15%	1.91	0.06
Score 2	1,288	20%	369	21%	1.02	0.03
Score 3	906	27%	468	28%	0.66	0.02
Score 4	982	34%	786	36%	1.74	0.05
Score 5	381	42%	406	45%	1.02	0.05
Score 6	157	47%	194	53%	1.59	0.12

Notes: New arrests for the detained subsample represent the forecasted occurrence of new arrests, while new arrests for the released subsample represents the observed new arrests after imputing new arrest for 2,139 released individuals.

Table C2:
Forecasting the Effects of Different Release Techniques on the Predicted Rate of New Arrest.

					Of Released		**Comparison to Court Release**					
	N Released	% Released	N Detained	% Detained	New Arrest	% New Arrest	Reduction in Detained	% Reduction in Detained	Reduction in New Arrest	% Reduction in New Arrest	*t-test* (New Arrest Rate)	Cohen's *d* (New Arrest Rate)
Reason for Release												
Court Released	19,989	70.9%	8,199	29.1%	4497	22.5%	--	--	--	--	--	--
Released by NCA Score												
NCA score of 1	7,284	25.8%	20,904	74.2%	979	13.4%	12,705	155.0%	-3,518	-78.2%	-18.22	-0.23
NCA score of 2 or less	15,516	55.0%	12,672	45.0%	2,636	17.0%	4,473	54.6%	-1,861	-41.4%	-13.05	-0.14
NCA score of 3 or less	20,554	72.9%	7,634	27.1%	4,010	19.5%	-565	-6.9%	-487	-10.8%	-7.39	-0.07
NCA score of 4 or less	25,674	91.1%	2,514	8.9%	5,778	22.5%	-5,685	-69.3%	1,281	28.5%	0.02	0.00
NCA score of 5 or less	27,488	97.5%	700	2.5%	6,565	23.9%	-7,499	-91.5%	2,068	46.0%	3.54	0.03
Released Everyone												
Released Everyone	28,188	100.0%	0	0.0%	6,916	24.5%	-8,199	-100.0%	2,419	53.8%	5.21	0.05

Table C3:
Forecasting the Effects of Different Release Techniques on the Predicted Rate of New Arrest (White Individual Only).

					Of Released		**Comparison to Court Release**					
	N Released	% Released	N Detained	% Detained	New Arrest	% New Arrest	Reduction in Detained	% Reduction in Detained	Reduction in New Arrest	% Reduction in New Arrest	*t-test* (New Arrest Rate)	Cohen's d (New Arrest Rate)
Reason for Release												
Court Released	3,330	73.7%	1,190	26.3%	639	19.2%	--	--	--	--	--	--
Released by NCA Score												
NCA score of 1	1,575	34.8%	2,945	65.2%	173	11.0%	1,755	147.5%	-466	-72.9%	-7.87	-0.22
NCA score of 2 or less	3,061	67.7%	1,459	32.3%	472	15.4%	269	22.6%	-167	-26.1%	-3.99	-0.10
NCA score of 3 or less	3,829	84.7%	691	15.3%	686	17.9%	-499	-41.9%	47	7.4%	-1.38	-0.03
NCA score of 4 or less	4,319	95.6%	201	4.4%	864	20.0%	-989	-83.1%	225	35.2%	0.89	0.02
NCA score of 5 or less	4,477	99.0%	43	1.0%	928	20.7%	-1,147	-96.4%	289	45.2%	1.69	0.04
Released Everyone												
Released Everyone	4,520	100.0%	0	0.0%	950	21.0%	-1190	-100.0%	311	48.7%	2.00	0.05

Table C4:
Forecasting the Effects of Different Release Techniques on the Predicted Rate of New Arrest (Black Individual Only).

					Of Released		Comparison to Court Release					
	N Released	% Released	N Detained	% Detained	New Arrest	% New Arrest	Reduction in Detained	% Reduction in Detained	Reduction in New Arrest	% Reduction in New Arrest	*t-test* (New Arrest Rate)	Cohen's *d* (New Arrest Rate)
Reason for Release												
Court Released	16,378	70.3%	6,908	29.7%	3,831	23.4%	--	--	--	--	--	--
Released by NCA Score												
NCA score of 1	5,514	23.7%	17,772	76.3%	786	14.3%	10,864	157.3%	-3,045	-79.5%	-15.88	-0.23
NCA score of 2 or less	12,146	52.2%	11,140	47.8%	2,131	17.5%	4,232	61.3%	-1,700	-44.4%	-12.23	-0.14
NCA score of 3 or less	16,380	70.3%	6,906	29.7%	3,279	20.0%	-2	0.0%	-552	-14.4%	-7.41	-0.08
NCA score of 4 or less	20,984	90.1%	2,302	9.9%	4,865	23.2%	-4,606	-66.7%	1,034	27.0%	-0.47	-0.00
NCA score of 5 or less	22,633	97.2%	653	2.8%	5,585	24.7%	-6,255	-90.5%	1,754	45.8%	2.94	0.03
Released Everyone												
Released Everyone	23,286	100.0%	0	0.0%	5,912	25.4%	-6,908	-100.0%	2,081	54.3%	4.57	0.05

Appendix D: Sensitivity Analysis Using Logistic Regression Imputation

Table D1:
Post-Forecasting Number of Cases and Percent Experiencing a New Arrest By NCA Score and Detention Status.

	New Arrests					
	Released (Total N = 19,898)		Detained (Total N = 8,199)			
	N	%	N	%	*t-value*	Cohen's *d*
New Arrest	4493	22%	3363	41%	29.99	0.42
NCA (Percent Experiencing New Arrests)						
Score 1 (New Arrest)	782	13%	357	28%	11.04	0.40
Score 2 (New Arrest)	1265	20%	580	33%	10.99	0.33
Score 3 (New Arrest)	907	27%	614	37%	6.80	0.21
Score 4 (New Arrest)	988	34%	1022	47%	9.37	0.27
Score 5 (New Arrest)	390	43%	543	60%	7.09	0.33
Score 6 (New Arrest)	161	48%	247	67%	5.25	0.40

Notes: New arrests for the detained subsample represent the forecasted occurrence of new arrests, while new arrests for the released subsample represents the observed new arrests after imputing new arrest for 2,139 released individuals.

Table D2:
Forecasting the Effects of Different Release Techniques on the Predicted Rate of New Arrest.

					Of Released		**Comparison to Court Release**					
	N Released	% Released	N Detained	% Detained	New Arrest	% New Arrest	Reduction in Detained	% Reduction in Detained	Reduction in New Arrest	% Reduction in New Arrest	*t-test* (New Arrest Rate)	Cohen's *d* (New Arrest Rate)
Reason for Release												
Court Released	19,989	70.9%	8,199	29.1%	4,493	22.5%	--	--	--	--	--	--
Released by NCA Score												
NCA score of 1	7,284	25.8%	20,904	74.2%	1,139	15.6%	12,705	155.0%	-3,354	-74.6%	-13.21	-0.17
NCA score of 2 or less	15,516	55.0%	12,672	45.0%	2,984	19.2%	4,473	54.6%	-1,509	-33.6%	-7.50	-0.08
NCA score of 3 or less	20,554	72.9%	7,634	27.1%	4,505	21.9%	-565	-6.9%	12	0.3%	-1.36	-0.01
NCA score of 4 or less	25,674	91.1%	2,514	8.9%	6,515	25.4%	-5,685	-69.3%	2,022	45.0%	7.23	0.07
NCA score of 5 or less	27,488	97.5%	700	2.5%	7,448	27.1%	-7,499	-91.5%	2,955	65.8%	11.58	0.11
Released Everyone												
Released Everyone	28,188	100.0%	0	0.0%	7,856	27.9%	-8,199	-100.0%	3,363	74.8%	13.55	0.12

Table D3:
Forecasting the Effects of Different Release Techniques on the Predicted Rate of New Arrest (White Individual Only).

					Of Released		Comparison to Court Release					
	N Released	% Released	N Detained	% Detained	New Arrest	% New Arrest	Reduction in Detained	% Reduction in Detained	Reduction in New Arrest	% Reduction in New Arrest	*t-test* (New Arrest Rate)	Cohen's d (New Arrest Rate)
Reason for Release												
Court Released	3,330	73.7%	1,190	26.3%	633	19.0%	--	--	--	--	--	--
Released by NCA Score												
NCA score of 1	1,575	34.8%	2,945	65.2%	192	12.2%	1,755	147.5%	-441	-69.7%	-6.38	-0.18
NCA score of 2 or less	3,061	67.7%	1,459	32.3%	504	16.5%	269	22.6%	-129	-20.4%	-2.66	-0.07
NCA score of 3 or less	3,829	84.7%	691	15.3%	732	19.1%	-499	-41.9%	99	15.6%	0.12	0.00
NCA score of 4 or less	4,319	95.6%	201	4.4%	914	21.2%	-989	-83.1%	281	44.4%	2.34	0.05
NCA score of 5 or less	4,477	99.0%	43	1.0%	982	21.9%	-1,147	-96.4%	349	55.1%	3.18	0.07
Released Everyone												
Released Everyone	4,520	100.0%	0	0.0%	1,002	22.2%	-1,190	-100.0%	369	58.3%	3.44	0.08

Table D4:
Forecasting the Effects of Different Release Techniques on the Predicted Rate of New Arrest (Black Individual Only).

					Of Released		**Comparison to Court Release**					
	N Released	% Released	N Detained	% Detained	New Arrest	% New Arrest	Reduction in Detained	% Reduction in Detained	Reduction in New Arrest	% Reduction in New Arrest	*t-test* (New Arrest Rate)	Cohen's d (New Arrest Rate)
Reason for Release												
Court Released	16,378	70.3%	6,908	29.7%	3,834	23.4%	--	--	--	--	--	--
Released by NCA Score												
NCA score of 1	5,514	23.7%	17,772	76.3%	929	16.8%	10,864	157.3%	-2905	-75.8%	-10.88	-0.16
NCA score of 2 or less	12,146	52.2%	11,140	47.8%	2,449	20.2%	4,232	61.3%	-1385	-36.1%	-6.60	-0.08
NCA score of 3 or less	16,380	70.3%	6,906	29.7%	3,735	22.8%	-2	0.0%	-99	-2.6%	-1.30	-0.01
NCA score of 4 or less	20,984	90.1%	2,302	9.9%	5,556	26.5%	-4,606	-66.7%	1722	44.9%	6.82	0.07
NCA score of 5 or less	22,633	97.2%	653	2.8%	6,417	28.4%	-6,255	-90.5%	2583	67.4%	11.07	0.11
Released Everyone												
Released Everyone	23,286	100.0%	0	0.0%	6,803	29.2%	-6,908	-100.0%	2969	77.4%	13.04	0.13