How long is long enough: Using abbreviated criminal histories for pretrial assessment instruments?

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The debate over pretrial assessment instruments focuses largely on the potential for instruments to exacerbate racial disparities. This study examines the effects of using different recall periods for the criminal history items on the New Criminal Arrest (NCA) scale from the Public Safety Assessment. Using jail admission data from a large jurisdiction, we varied the recall period – from 1 to 10 years prior to the current arrest – for the criminal history items on the NCA scale and examined scoring differences and the predictive validity of the tool by race. The results showed reductions in the proportion of Black people scored as high risk and no loss in validity using a shorter criminal history review. The current study demonstrates that shorter recall periods for criminal history items on pretrial instruments could potentially provide a direct and practical strategy to mitigate the effects of mass incarceration, while maintaining predictive validity.
Introduction

Prior criminal justice contact is a strong predictor of future criminal justice contact. Someone arrested in the past is more likely to be arrested in the future when compared to a person without prior arrests (Nagin and Paternoster, 2000). The heightened probability of arrest decreases rapidly as someone remains crimefree (Kurlychek et al., 2006). Criminal behavior is not static over the lifecourse such that desistance from crime is common, even for individuals considered to have a high rate of criminal involvement (Bersani and Doherty, 2018: 313). Participation in criminal behavior is known to peak in the late teens and early adult years, with individuals desisting from involvement thereafter (Laub and Sampson, 2003). Desistance is a complex process in which individuals decrease their level of participation in criminal activity. Although there are many definitions of desistance (Bersani and Doherty, 2018; Broidy and Cauffman, 2017), there is general agreement that desistance is the process by which individuals change, reshape, and assess their lives such that they reduce the frequency and severity of criminal behavior (Maruna, 2001). There are multiple explanations for the age-crime curve that often focus on some combination of maturation or process models of desistance (Bushway and Uggen, 2021). The maturation perspective emphasizes that people reduce their desire for and willingness to engage in risk-tasking behavior due to natural processes related to getting older. Process models, on the other hand, suggest a structural argument for desistance in which as people age, they become more involved in pro-social activities including education, jobs, and marriages that pull them away from criminal behavior (Sampson and Laub, 2003).

Although desistance and age-graded theories of criminal behavior are cogent understandings of criminal propensity through the lifecourse, these theories have minimal influence on criminal justice policy and practice. Instead, Risk-Need-Responsivity (RNR) model is the leading paradigm for criminal justice professionals when developing and implementing policies to reduce reoffending.
The RNR literature is predicated on the notion that people have different criminal propensities and that criminal justice resources should be delivered based on the amount of risk someone poses (Bonta and Andrews, 2010). That is, people more likely to commit new or serious crimes, need more supervision or intervention, whereas those posing little potential to commit crimes, should be left alone (Viglione and Taxman, 2018). Risk assessment instruments are a central feature of RNR models as they provide a systematic and statistical evaluation of an individual’s propensity to reoffend. There are instruments developed for different decision points within criminal legal systems (Bonta, 1996). Most recently pretrial assessments have received a lot of scrutiny about the potential to worsen racial disparities in pretrial detention (Desmarais et al., 2021).

Pretrial instruments, essentially, focus on prior criminal legal system involvement to determine the likelihood of future crime (Corbett-Davies and Goel, 2018). Typically, lifetime criminal history records are used to estimate the probability that someone will be arrested in the future (i.e., risk scores). The lifetime scores overlook fundamental criminological findings showing that people age out of crime, that older criminal activity is less predictive than recent activity, and the potential for lifetime scores to worsen racial disparity. There is mounting evidence that, following an initial period, the probability of a new arrest declines as time increases from ones’ last contact with criminal legal systems (Blumstein and Nakamura, 2009: 329). Why do pretrial instrument scores rely on a static view of criminal involvement patterns when there is mounting evidence suggesting the opposite?

Although it is true that prior behaviors are predictive of future behavior, it is also true that people change, and we need to incorporate a holistic view of human behavior (Sullivan, 2013). Pretrial instruments are being used by nearly 50 percent of pretrial agencies across the country and contribute to thousands of pretrial decisions on most days (Lattimore et al., 2020). However, these tools typically rely on lifetime criminal history records that may not increase the predictive validity.
and could potentially worsen racial disparities in the pretrial system and thereafter. Black people are more likely to be stopped, searched, arrested, and prosecuted than White people, and therefore will have higher scores on pretrial instruments (Pierson et al., 2020; Stolzenberg, D’Alessio, & Etile, 2013; Kochel et al., 2011). For pretrial instruments, however, predictions are most effective when prior behavior happened a short time before the current arrest, as increasing time diminishes the magnitude of the association between past and future criminal behavior (Blumstein and Nakamura, 2009). Recidivism studies make clear that the highest probability of failure is shortly after release from prison or supervision with probabilities monotonically declining (Lattimore and Linster, 1991).

In this study, we use insights developed through the desistance literature focused on the notion of redemption to test different recall periods for scoring the criminal history items on the New Criminal Arrest (NCA) scale of the Public Safety Assessment. We compare the predictive validity of the NCA scale using different scoring schemes for the criminal history items, with recall periods ranging from 1 years to 10 years. The current study is designed to directly evaluate how the recall of criminal history items influences differential scoring and the predictive validity of the instrument, with a focus on understanding the timeframe in which criminal history is no longer relevant for inclusion on the Public Safety Assessment (PSA).

The current study is important for at least the following three reasons. First, pretrial detention can have serious negative consequences for individuals (Dobie et al., 2018; Lowenkamp, 2022; Walker, 2022). Second, during pretrial, people are innocent and have yet to be convicted of a crime. Third, the goal is to look for ways to release people rather quickly; that is, given that people are innocent, most people have low probabilities of rearrest during pretrial, and pretrial detention can make things worse, we want to find efficient ways to identify quick and safe release mechanisms (Milgram et al., 2015). For this reason, many jurisdictions use pretrial instruments with some of these focused exclusively on current and past criminal involvement.
This paper is arranged in the following way. First, we describe the Public Safety Assessment (PSA), factors, and scoring procedures. Second, we review the prior research on pretrial instruments to summarize the validity and bias studies. Third, we introduce key concepts from the desistance and redemption literature to situate our study within contemporary criminological theories. Fourth, we describe our data, plot Area Under the Curve (AUC) by racial categories, and present findings from eleven time-specific logistic regression models testing for predictive bias. Last, the conclusion offers recommendations for instrument development and use in real-world settings. The conclusions are centered on the potential policy implications of our findings in which we demonstrate no loss in predictive power and reductions in disparity when using shorter criminal history windows.

**Pretrial Assessments**

Pretrial instruments are used in many courts with the goal to improve pretrial decisions (Lowder et al., 2020). The pretrial process involves judges (or magistrates) deciding the likelihood of someone appearing in court and public safety concerns to determine the conditions of release or require detention (Dhami and van den Brink, 2022). These decisions are typically made within 24-48 hours after someone is admitted into a jail, and legal actors typically have only a brief period to gather information to support pretrial decisions.

Pretrial decisions are not binary and can include a judge deciding to release someone on their own recognizance (ROR), requiring conditions (e.g., bail, drug tests), or denying release (Baughman, 2017). Oftentimes, pretrial decisions are made quickly, with judicial officials making decisions with limited information and required to maintain the constitutional guarantees protecting the freedoms of legally innocent individuals (Dhami and van den Brink, 2022). Legal actors have broad discretion in making pretrial decisions that results in variation in the information jurisdictions use to make pretrial release decisions (Stevenson, 2018). Nevertheless, pretrial decisions are some of the most consequential decisions in case processing because people can be detained for weeks, months, and,
in rare situations, even years as someone’s case is being adjudicated (Lowenkamp, 2022; Walker, 2022).

One approach to improving pretrial decision making has been to introduce pretrial assessment instruments. Assessment instruments are not new to criminal legal system actors (Burgess, 1928), and they have similarities to actuarial tools used to support numerous high-stakes decisions (Aguinis and Smith, 2007; Maxim et al., 2014). Pretrial instruments were introduced in the 1960s when the Manhattan Bail Project tried to reduce pretrial detention by releasing many individuals unable to afford bail (Ares et al., 1963). The development and use of pretrial instruments laid dormant for several decades, but as studies about mass incarceration demonstrated the overreliance on pretrial detention there has been a resurgence in efforts to find ways to reduce jail populations. Initially, pretrial instruments were welcomed to improve pretrial decisions, and some even hoped assessments could reduce racial disparities (Milgram et al., 2015). Quickly, however, pretrial instruments were critiqued on grounds they were inherently problematic because they would increase racial disparity (Angwin et al., 2016).

Several researchers responded to the critiques about inherent bias by conducting local validations that demonstrated assessments are valid instruments for all racial and biological sex groups, producing limited evidence of predictive bias (Desmarais et al., 2021). Finding pretrial assessments to be fair and valid in many jurisdictions is an important first step to deciding whether to scale the implementation of pretrial instruments. Decision makers need pretrial instruments that are not only valid and free of predictive bias, but they need pretrial instruments that can contribute to improved decisions (Aguinis and Smith, 2007; Berk et al., 2021). There is a large body of research demonstrating the potential for actuarial instruments to support and improve human decisions across several fields (Kleinberg, et al., 2018; Meehl, 1954). Ongoing research is needed as some researchers have found predictive bias with assessments used in other fields including health.
screeners (Obermeyer et al., 2019) and child welfare instruments (Chouldecova et al., 2018). Many observers agree that the U.S. has an unhealthy overreliance on incarceration as a primary response to social problems and unwanted behaviors. The toll of this overreliance on incarceration are felt disproportionately such that Black people have carried the brunt of the consequences.

The debate about the use of pretrial instruments to inform pretrial release decisions mostly revolves around the concern that assessments exacerbate racial bias by scoring Black people as higher risk than their true propensity for failure (Desmarais et al., 2022). This critique focuses on two main issues with pretrial instruments. First, some researchers argued that many of the factors on pretrial instruments correlate so strongly with race that they are merely proxies for race (e.g., residential stability, poverty) (Harcourt, 2015). Second, others argued that the use of criminal history factors on assessments automatically disadvantages Black people because they face undo attention from law enforcement and substantive disadvantages in criminal legal system processing (i.e., differential enforcement). That is, Black people are more likely to be stopped, searched, arrested, and prosecuted than similar White people (Pierson et al., 2020; Stolzenberg et al., 2013; Kochel et al., 2011).

The first critique is readily addressed as many pretrial instruments do not include these proxies for race such as homelessness, poverty, and the like (Corbett-Davies and Goel, 2018). The second critique, however, is more challenging to address because the number and severity of prior criminal legal system contacts are important factors when considering likelihood of rearrest. It is well-documented that convictions from 10, 15, or 20 years ago are not as predictive of future involvement in the criminal legal system as more recent convictions (Blumstein and Nakamura, 2009; Bushway et al., 2011). The decreasing prediction power of prior criminality on future criminality was empirically demonstrated by Blumstein and Nakamura (2009), which showed that someone remaining crime free for 5-7 years is no more likely to be rearrested than someone that has
never been arrested before. The current study is motivated by these findings, which suggest that reducing the recall period for criminal history items on pretrial instruments could represent a practical solution to the mean score differences between White people and Black people. The redemption literature could provide insights into for how to adjust the scoring of pretrial instruments.

**Pretrial Assessments and Scoring Differences**

When average instrument scores vary by subgroups there is an underlying data generating process that requires looking at how groups score on the presence and absence of the defined risk factors (DeMichele and Baumgartner, 2021). Corbett-Davies and Goel (2018) introduced the importance of the inframarginality problem with pretrial instruments in which group-level differences in underlying risk distributions result in variation in group level error and accuracy rates. Inframarginality entails that regardless of the validity of an assessment, individuals within the group with the higher average score will have a higher false positive rate relative to the other group and individuals within the group with lower mean scores will have higher false negatives (Corbett-Davies and Goel, 2018).

The underlying properties of instruments resulting in the inframarginality problem necessitate determining if alternative scoring procedures could reduce the potential for mean score differences. Prior validation and bias tests demonstrate the PSA is valid and lacks evidence of predictive bias, but these studies usually show that Black people commonly score higher risk (Brittain et al., 2021), which is not in itself a form of predictive bias but can be related to disparate impact (Aguinis and Smith, 2007; Skeem and Lowenkamp, 2016). It is possible that relying on lifetime criminal history records to score pretrial instruments contributes to the inframarginality problem. The research on redemption can be used to reformulate pretrial assessments and potentially offer alternative scoring strategies, including relying on shorter recall periods for the...
criminal history items, that can maintain the predictive validity of pretrial instruments. The reduction in criminal history recall periods is supported by criminological theories that largely argue that people desist from crime throughout the lifecourse, and long periods crime free demonstrate a shifting identity away from that of someone involved with crime (Blumstein and Nakamura, 2009).

Redemption and Criminal History on Pretrial Assessments

The study of redemption focuses on the process by which individuals reduce their rate of criminal behavior to similar levels of the general population that have not been arrested. Blumstein and Nakamura (2009) defined redemption “as the process of ‘going straight’ and being released from bearing the mark of crime.” Redemption is a consistent finding in the literature, evident by research suggesting that individuals with multiple prior arrests tend to escalate and eventually de-escalate in their involvement with crime (Broidy et al., 2015; Bushway and Tahamont, 2016; DeLisi and Piquero, 2011). While a small subset of individuals is involved with criminal activity throughout the lifecourse, most people desist from criminal activity as they age (Farrington, 2004; Sullivan 2013). Prior research suggests that lifetime criminal history records are unlikely to improve prediction, likely to exacerbate racial disparity, and may create additional burden (i.e., officers needing to review lifetime records).

Many people have made mistakes, committed crimes, and been arrest and convicted. Criminal behavior is known to peak through late adolescence and through ones 20s, and decline thereafter, but this does not mean that people engage in a steady decline of criminal activity. Rather, desistance is known to vary with social position, structural resources, and idiosyncratic individual differences (Bersani and Doherty, 2018. Desistance is characterized more by a process of recovery and relapse and look more like a zigzag than a linear trend. There is a social norm that after individuals complete a sentence, they have served their punishment and society views that they have ‘paid the price of crime.’ This is something of a natural redemption process in which people can pay
for their crimes and move on with their lives. However, redemption is not so simple because now we have vast criminal history databases that allow for recording and sharing fine grained details about people’s past involvement with crime (Kurlychek et al., 2007).

The PSA and other pretrial instruments use lifetime criminal history records to estimate predicted probabilities of future arrests. The reliance on lifetime criminal history records creates a situation where an individual with three prior convictions that occurred over ten years prior is classified in a similar risk category as someone with three prior convictions that occurred within the prior three years. Yet, the redemption literature demonstrates that recency in offending matters in assessing the probability of future offending (Bersani and Doherty, 2018; Bushway et al., 2011). The use of lifetime criminal history records to score pretrial instruments guarantees that people will continue to pay for prior crimes that may have happened long ago. Mass incarceration is a well-studied aspect of contemporary crime control that has disproportionately affected Black people. Combining hyper policing of Black people with powerful criminal history databases to create lifetime risk scores guarantees that Black people will inevitably have higher average risk scores.

Individuals with prior criminal records are typically treated harsher by criminal legal systems, where the accumulation of criminal records can result in a greater likelihood of detention, higher bail, and more stringent release conditions. Prior research shows that recidivism probabilities decrease over time (Visher et al., 1991), such that higher proportion of release samples are arrested within the first 3 years of release and declines afterward. Scholars have found that individuals released from prison for crimes like burglary, robbery, and larceny had the highest recidivism rates, and an earlier onset age is a good predictor of a serious criminal career, (Piquero et al., 2007). Blumstein and Nakamura (2009) modeled recidivism risk and found that recidivism risk declines so much that it crosses the level of the public of similar age and composition such that after 5 to 7
years arrest free, individuals with prior criminal involvement were no more likely to be arrested than people that have never been arrested.

Applied criminologists and practitioners have grappled with how to improve pretrial decisions that support public safety, limit the negative effects related to pretrial detention, and minimize the potential for racial disparity. Debates over pretrial instruments have emerged to pit reform minded scholars and activists against one another. Some scholars have suggested that instruments should be driven by machine learning techniques to produce simple decisions rules (Zeng et al., 2017), others have tried debiasing techniques (Skeem and Lowenkamp, 2020), and still others suggest there is no place for pretrial instruments (Angwin et al., 2016). We take a more middle ground perspective here to combine understanding of the error proneness of human decision making (Kahneman, 2011), the need to account for or develop discounts of criminal history of people of color due to differential enforcement and offer a test of a simple and practical adjustment to scoring pretrial assessment instruments.

**Current Study**

In the current study, we test scoring configurations for the criminal history items included in a popular pretrial instrument, the Public Safety Assessment (PSA). The PSA is composed of three separate scales to measure three pretrial outcomes of failure to appear (FTA), new criminal arrest (NCA), and new violent criminal arrest (NVCA). The scales are scored by reviewing lifetime criminal history records for individuals admitted to a jail for a new charge (e.g., excluding probation violations). The current rules for scoring the PSA are for court actors to review lifetime criminal histories to assess whether the person has prior convictions across different legal or charge categories (e.g., misdemeanor, felony, violent). The use of lifetime criminal history scores provides an interesting empirical puzzle worth exploring to understand what would happen if the recall periods for the criminal history items were shortened. Simply, would a pretrial instrument using only
a few years of criminal history records perform as well as the lifetime scores? And is it possible that abbreviated criminal history records could reduce scoring disparities on the assessment? The primary research questions are:

1. **Redemption:** Do the NCA scores created with abbreviated criminal history records reduce the predictive validity of the NCA scale?

2. **Disparity:** Do the NCA scores created with abbreviated criminal history records reduce racial bias in the proportion of Black people with high scores?

3. **Predictive bias:** Do the NCA scores created with abbreviated criminal history provide equal probabilities of new arrests for Black and White individuals?

Specifically, we rescore the criminal history items for the PSA NCA scale by using different recall periods – 1 to 10 years prior to the current arrest – and compared these scores to those generated from lifetime criminal history records. This multi-stage comparison focuses on evaluating if scoring disparities on the PSA NCA scale could be reduced between Black and White people while maintaining the predictive validity of the assessment for both groups.

**Methods**

**Data**

The analyses focused on the released adult pretrial population with a dataset containing jail admissions from one county in the Southeastern region of the US. Data collection occurred as part of a larger multi-county project researching pretrial systems, combining information from jail, pretrial services, and court agencies. The inclusion of multi-agency information allows for the tracking of individuals from first jail admission though the pretrial process. Lifetime criminal histories are also included in the dataset and provide information on prior convictions and sentencing. The availability of criminal history information allowed for the retrospective scoring of the PSA NCA factors based on defined recall periods. The dataset was restricted to all adult pretrial bookings into jail between January 1, 2017 and December 31, 2018 for new charges (total admissions = 33,499). Cases were removed if they were younger than 18 years of age at the time of
admission \( (n = 865) \) or had booking dates after December 2018. Additionally, jail admissions associated with probation and parole misconduct, inmate transfers, and immigration cases were removed from the analytical sample. Individual bookings were considered released if they had release dates and had disposition dates after their release dates by December 31, 2019, and included a release description that did not indicate transfer to another corrections facility or arresting agency. The validation release sample included detail on 19,946 admissions where individuals were released before case disposition while 13,553 admissions did not result in a pretrial release. Scoring differences in the NCA scale with different recall periods were evaluated with the full analytical sample \( (N = 33,499) \), while differences in the predictive validity of the NCA scale with different recall periods were evaluated on the subsample of bookings released into the community during pretrial \( (N = 19,946) \). For more information on the data, please see

https://advancingpretrial.org/appr/appr-research/

Measures

**Varying Scoring for Criminal History Items on the NCA Scale**

The NCA scale is scored using seven factors, four of which are criminal history items that rely on lifetime criminal history. Information on the criminal history factors was measured by using previous conviction data within the jurisdiction as well as using statewide criminal history records. The four *lifetime criminal history* items include: prior misdemeanor convictions \( (\text{No} = 0, \text{Yes} = 1) \), prior felony convictions \( (\text{No} = 0, \text{Yes} = 1) \), prior incarceration sentences \( (14 \text{ days or more}; \text{No} = 0, \text{Yes} = 2) \), and prior violent convictions \( (0 = 0, 1 \text{ or } 2 = 1, 3+ = 2) \). For instance, as of the current moment, any individual with a prior misdemeanor conviction at any point in their life – 1-year ago or 30+ years ago – would score a “1” on this item. The same can be said about prior felony convictions, prior incarceration sentences, and prior violent convictions. In addition to the four lifetime criminal history items, three additional items are used to score the NCA scale, including
pending charge (No = 0, Yes = 3), prior FTA in past 2 years (0 = 0, 1 = 1, 2+ = 2), and age at current arrest (23+ = 0, 21 and 22 = 2, 20 or younger = 2). These items are scored with a shorter recall period automatically – e.g., prior FTA in past 2 years – or are associated with the characteristics at the time of arrest. These scores are converted into an NCA scale as follows: 0 = 1, 1 and 2 = 1, 3 and 4 = 3, 5 and 6 = 4, 7 and 8 = 5, 9-13 = 6.

Focusing on the lifetime criminal history items (i.e., prior misdemeanor conviction, prior felony conviction, prior incarceration sentence, and prior violent convictions), new coding schemas were implemented to answer the primary research questions to determine if shorter recall periods maintain predictive power. That is, would a pretrial instrument using only a few years of criminal history records perform as well as the lifetime scores? And is it possible that abbreviated criminal history records could reduce scoring disparities on the assessment? The lifetime criminal history items on the NCA scale were rescored using 1-year to 10-year recall periods. For instance, using a 1-year recall period, only bookings with a prior misdemeanor conviction within the past year (from the date of the arrest) would score a “1” on this item. Similarly, only bookings with a prior felony conviction in the past 5-years would score a “1” on this item if we were relying on a 5-year recall period for the criminal history items.

This process of rescoring the NCA scale using different recall periods for the assessment resulted in 11 NCA scores for everyone, ranging between 1 (low risk) and 6 (high risk). The 11 NCA scores were: NCA score with a 1-year recall period, NCA score with a 2-year recall period, NCA score with a 3-year recall period, NCA score with a 4-year recall period, NCA score with a 5-year recall period, NCA score with a 6-year recall period, NCA score with a 7-year recall period, NCA score with a 8-year recall period, NCA score with a 9-year recall period, NCA score with a 10-year recall period, and NCA score with a lifetime recall period.

**Outcome: New Criminal Arrest**
New criminal arrest during pretrial served as the primary dependent variable to evaluate the heterogeneity of the predictive validity of the NCA scale with distinct recall periods for the criminal history items. A new criminal arrest during pretrial was operationalized as a dichotomous indicator identifying if an individual was arrested by police for any new offense during pretrial. Arrest information was collected using statewide criminal history searches for any arrest that occurred for a new offense during pretrial between 2017 and 2019. If an individual was arrested during pretrial for a new offense, they received a value of “1” on the new criminal arrest outcome. If an individual was not arrested during pretrial for a new offense, they received a value of “0” on the new criminal arrest outcome.

**Black and White**

Given that Black (85%) and White (15%) individuals comprised most individuals booked into jail, our analysis tests for differences between Black and White people.\(^1\) An individual was identified to have a racial heritage of Black if they self-identified as Black to criminal justice officials upon intake into jail during the current offense. An individual was identified to have a racial heritage of White if they self-identified as White or of European descent to criminal justice officials upon intake into jail during the current offense.

**Analytic Approach**

First, we review the descriptive characteristics of the sample and provide the prevalence of bookings that would score a value of “1” on the four criminal history items used to score the NCA scale if the recall period was 2-years, 5-years, 8-years, 10-years, and lifetime. Additionally, we assess the scoring differences between Black and White bookings on the NCA scale across each of the recall periods. Second, predictive validity is measured using Area Under the Curve (AUC) Receiver

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\(^{1}\) There were only a limited number of bookings associated with other ethnic or racial groups, creating difficulties producing stable estimates of within-group predictive validity for the NCA scale.
Operator Characteristic (ROC) estimates. AUCs are commonly used to evaluate risk assessments (Singh and Falzer, 2010) because they are not influenced by base rates and allow for making comparisons across models and groups, and they do not rely on arbitrary thresholds, but instead test the predictive validity of a model (Swets, 1988). The AUCs range from 0 to 1.0 with .5 indicating random chance and 1.0 indicating perfect prediction. The AUC provides an intuitive interpretation as it reports the likelihood that when randomly selecting a case that was rearrested, that case would have a higher score on the PSA than a randomly selected case that was not rearrested. AUCs measure the ability of a pretrial instrument to make correct positive classifications by plotting the true positive rate (i.e., correct high-risk predictions) by the false positive rate (i.e., incorrect high-risk predictions). Differences in AUCs between the shortened recall period and lifetime criminal history were calculated using the bootstrap comparison method included in the pROC package (Frédérique et. al., 2011) in the R Statistical Computing Language using R version 4.3.1 (2023-06-16) (2023).

Lastly, we test for differential prediction by estimating the moderation effects. These moderation effects provide insight into if the NCA scale score with the shortened recall periods differentially predicts new criminal arrest for Black people compared to White people (Cohen and Lowenkamp, 2019). The moderation effects were estimated by regressing new criminal arrests on the NCA scale score with a specified recall period, the race of the individual, and an interaction between the NCA scale score and the race of an individual using a binary logistic regression model (American Educational Research Association, American Psychological Association, and National Council on Measurement in Education, 2014).

Results

Descriptive Statistics

As shown in Table 1, 26 percent of the jail admissions for Black people resulted in an arrest for a new crime compared to 20 percent of that jail admissions for White people. The analytical
sample was mostly male, with more than 70 percent of admissions being male across both racial
groups. Looking at the distribution of the most serious charge associated with the admission, there
were slight but statistically significant differences by race, with Black individuals being more likely to
be admitted to jail for a violent offense (34 percent) when compared to White individuals (29
percent). A larger proportion of White individuals were released during pretrial (63 percent) when
compared to Black people (59 percent).

[Insert Table 1 About Here]

**Testing Redemption: Rescored PSA NCA Factors**

Four of the seven items used to score the NCA scale currently rely on lifetime criminal
history records: prior misdemeanor convictions (No = 0, Yes = 1), prior felony convictions (No =
0, Yes = 1), prior incarceration sentences (14 days or more; No = 0, Yes = 2), and prior violent
convictions (0 = 0, 1 or 2 = 1, 3+ = 2). Table 2 shows the differences by race in the prevalence of
the criminal history factors used to score the PSA when using 2-years, 5-years, 8-years, 10-years, and
lifetime recall periods for these criminal history items. Across the criminal history factors, the
prevalence of the items increased as the recall period lengthened. This increase in prevalence
corresponded with an increase in the scoring gap between Black and White people. For instance,
Table 2 shows that when using a 2-year recall period for the criminal history items, a similar
proportion of admissions for Black and White people have a prior misdemeanor – 25 percent (N =
7,126) and 21 percent (N = 1,076), respectively. The proportion of individuals scoring a “1” on prior
misdemeanor, however, increase to 58 percent (N = 16,426) and 49 percent (N = 2,471),
respectively, when using a lifetime recall period for the criminal history items. Using the two-year
history records, 12 percent (N = 3,357) and 8 percent (N = 414) of Black and White people,
respectively, have a prior conviction for a felony charge, whereas 41 percent (N = 11,676) and 24
percent (N = 1,213) of Black and White people have a prior conviction for a felony charge when
using the lifetime criminal history records. These differences are large, statistically significant (p < .001), and meaningful.

There are large differences in the proportion of people scored with a prior violent conviction when comparing the recall years. The difference in the prevalence of prior violent convictions between Black and White people when using a two-year recall period vs. lifetime criminal history increases from 8% (n = 2,245) and 4% (n = 207), to 35% (n = 9,829) and 16% (n = 804) for Black and White people, respectively. A similar trend exists with prior sentence to incarceration, which increases from 12% (n = 3,297) and 6% (n = 298) to 34% (9,706) and 16% (n = 832) for Black and White people between the two-year and lifetime scoring procedures.

[Insert Table 2 About Here]

**Testing Redemption: Predictive Validity**

Table 3 provides the AUCs for the NCA scale by recall period for the criminal history items and comparatively evaluates the predictive validity of the time-specific NCA scores with the lifetime NCA scores. When comparing the shortest recall periods (1-4 years) for the criminal history items, the lifetime recall period does appear to have higher predictive validity. The AUCs for the 1-4 year recall period for the criminal history items range between 0.613-0.650, while the lifetime recall period achieves an AUC of 0.653. However, the difference in AUC vanishes when using a 5-year recall period. Using a 5-year recall period has equal predictive validity as the lifetime recall. Importantly, the predictive validity associated with using longer recall periods (e.g., 6-10 years) did not appear to substantively improve when compared to the 5-year recall period.

[Insert Table 3 about here]

Figure 1 Panel A plots the AUCs by years for Black (AUC = .654) and White people (AUC = .652). The 1 to 5-year recall periods for the criminal history items appears to achieve comparable predictive validity for Black and White people, with differences in the AUCs being observed
primarily after using a 6-year recall period for the criminal history items on the NCA scale. The longer recall periods have slightly higher AUCs but appear to introduce differences in the predictive validity of the NCA scale across Black and White people.

Figure 1 Panel B plots the proportion of White and Black people who scored between 4 and 6 (high risk) on the NCA scale by recall year. Pretrial instruments are criticized for introducing inherent bias due to relying on criminal history records, and we find large differences between and within races over time in the proportion of bookings scoring high risk (scale score of 4 or more). Longer recall periods for the criminal history items result in a higher proportion of individuals scoring high risk (scale score of 4 or more) on the NCA scale. When using a recall period of 1-year for the criminal history items, 13 percent and 7 percent of Black and White people scored high risk on the NCA scale (respectively). This increased to 37 percent and 19 percent for Black and White people (respectively) when using the lifetime recall for the criminal history items on the NCA scale. Figure 1 Panel B illustrates that to gain equal proportions (19%) of Black and White people with higher scores, we would need to use a 3-year recall period when scoring the criminal history items for Black people and a lifetime recall when scoring the criminal history items for White people. Focusing on a 5-year recall period for the criminal history items, there would be 4,240 fewer people with a high-risk score on the NCA scale. This reduction in the number of people scoring as high risk would mostly affect Black people, as there were 38 percent fewer Black people that scored high risk when using the 5-year recall period.

[Insert Figure 1 about here]

**Testing Disparity: Differential Validity and Proportion with High Scores**

Table 4 shows the results from 11 logistic regression models that include race (White =1), the NCA score (1 = reference), and a race by score interaction term. These analyses allow us to test whether race moderates the PSA NCA score to evaluate if we find differential prediction of the
outcome by race. A significant interaction term would indicate different regression lines for Black and White people. The logistic regression models show minimal direct effects for race on new arrests, but the odds ratios are below 1 and in line with the higher base rates for Black people. The NCA score was predictive of new arrests \((p < .001)\), with a 1-point increase in the NCA score corresponding to a 50% increase in the odds of a new arrest. The interaction term for the NCA score using the lifetime recall period was statistically significant \((p < .001)\), suggesting that a 1-point increase in the NCA score for White people corresponded with a higher odds of new arrest than Black people. This effect suggests that the NCA scale score underpredicts for Black people when compared to White people. Notably, however, the NCA score using 1-10 year recall periods for the criminal history items were not moderated by race, suggesting that the underprediction for Black people might be the product of using the lifetime recall period.

[Insert Table 4 about here]

Discussion

Desistance consists of complex processes through which people change the frequency and severity of their criminal involvement (Bersani and Doherty, 2018). Criminal involvement wanes as people get older and become more involved in prosocial institutions (e.g., marriage, employment). Although many individuals engage in criminal activity for many years or even decades, most people age out of criminal involvement (Bushway and Uggen, 2021; Sullivan, 2013). Moreover, age at first arrest and prior criminal justice involvement are associated with future criminal activity, but this relationship monotonically decreases (and disappears) as people remain arrest free. Prior criminal involvement has a diminishing association with future crime as one’s time arrest free increases. Despite these general criminological axioms, pretrial assessment instruments do not include basic tenets of desistance theory. No doubt, prior criminal involvement is an important indicator for future criminal behavior, but we should recognize that people make mistakes and people change...
their behavioral patterns. The current study provides a simple adjustment for agencies to consider when scoring criminal history risk scales that maintains predictive validity, decreases the proportion of Black people with higher scores, and lacks evidence of differential validity or prediction.

The current study contributes to criminological research and practice by assessing the potential to adjust the inherent properties of the PSA by altering the scoring procedures for the criminal history items on the instrument. Black people often have higher average scores in local validation samples resulting in the infra-marginality problem that will produce higher false positives for Black individuals and higher false negatives for White individuals (Corbett-Davis and Goel, 2018). We found significant meaningful differences in the proportion (and number) of Black people with higher scores by using abbreviated criminal history records to score the PSA NCA scale. There are at least three main implications of our research.

First, pretrial instruments are criticized for lacking any theoretical foundation. Our analyses were motivated, in part, by the theory of redemption in the desistance literature. The redemption research demonstrates that individuals remaining arrest free for several years have similar likelihood of rearrest as someone that has never been arrested (Blumstein, and Nakamura, 2009). The propensity to engage in criminal behavior is time-variant such that people have shifting probabilities of committing crimes over the lifecourse. It is difficult to control for this time-variance in real-world pretrial instruments given that there is little time to complete the instruments (i.e., within 24-48 hours), limited information to inform pretrial decisions (i.e., mostly current and prior criminal history records), and short at-risk periods (e.g., case processing typically takes 6-9 months). The current study is an initial step toward recognizing the time-variant properties of the strength of the association between prior convictions and future arrests by acknowledging that more recent convictions will have a stronger association with future criminal behavior. Our findings are supported by a strong theoretical foundation, and they align with notions of redemption.
Second, our findings provide evidence that creating risk scores using abbreviated criminal history records – shortened recall periods when scoring criminal history items – have the same predictive validity as those developed with lifetime criminal history records. Learning that abbreviated criminal history records are as predictive as lifetime records is an important and practical finding because these can mitigate the critiques that pretrial assessments are racially biased due to Black individuals having longer criminal histories. The PSA NCA scale uses prior convictions as factors, which presents opportunities and challenges. That is, few people would disagree that prior convictions are important to consider when making pretrial release decisions as someone with more criminal involvement or involvement with more serious crimes would pose different risks and have different needs than someone arrested for the first time. There is a fine line, however, between acknowledging the public safety concerns of prior convictions and assessment instruments becoming a form of secondary punishment for a conviction that happened many years ago. In fact, it could be that someone that has remained arrest-free for many years, but is rearrested, may have reemerging needs that could be addressed with something other than pretrial detention. We see this research as providing an opportunity to think more deeply about pretrial decision making, notions of pretrial risk, and public safety. Pretrial detention has the potential to exacerbate negative outcomes for people, and as such pretrial policies should focus on using pretrial detention sparingly (Walker, 2022). Using abbreviated criminal history records to complete pretrial assessments has the potential as a practical change to decision making that could have major implications to ease the burdens of mass incarceration.

Third, the findings point to large differences in the proportion of Black people scored as high risk when using the 5-year recall period compared to lifetime scoring. There are numerous reform efforts underway trying to reduce pretrial populations and racial disparity, but these efforts, for the most part, have yet to yield significant reductions in racial disparities (Zeng, 2022). The
current study presents an opportunity to consider how using abbreviated criminal history records to complete pretrial assessment instruments could contribute to such reform efforts. If we combine the findings from Kleinberg et al.’s (2018) study showing that decisions made with a pretrial instrument can maintain release rates and reduce arrests using actuarial decision making with the current study, we see that applying such a risk-based release approach with abbreviated criminal history records has the potential to make meaningful differences in release populations. The results showed substantial differences in the proportion of Black people scored as high risk, which means that by scoring more Black people as lower risk, decision makers (e.g., judges, magistrates) would receive recommendations with limited conditions and opportunities to ease release conditions for more Black people. In fact, the implications from the current study are one of the few studies to provide potential direct and practical strategies to ease the burden of mass incarceration specifically for Black people, while maintaining predictive validity of the instrument.

Limitations

The importance of the findings from the current study should be interpreted with three limitations in mind. First, the findings from the current study were produced from a single jurisdiction in the southern United States. While limiting the recall period of the criminal history items on the PSA appears to be a practical solution to the critiques of pretrial assessment instruments, future research should replicate the current study to ensure that these findings are consistent across jurisdictions. Second, the results of the current study speak to the employment of abbreviated criminal history when scoring the PSA new criminal activity scale but cannot be used to generate interpretations about the effects of shortening the recall period for other pretrial outcomes related to missed court appearance. Instead, this is an area for future research to consider other pretrial outcomes using abbreviated criminal histories to assess the likelihood of missing court. Finally, the current study did not examine if structural differences in the functionality of the PSA
new criminal activity scale differed between Black and White individuals when using distinct recall periods for the criminal history items. Future research should examine if using abbreviated criminal histories improves the performance of the PSA new criminal activity scale for Black individuals using different metrics (Berk et al., 2021).

**Conclusion**

This study addresses several gaps in the criminological literature about pretrial instruments. We demonstrate the predictive validity losses and gains when comparing different annual criminal history scores to those derived from lifetime criminal history. The study shows the impact on racial disparity when using shorter criminal history records. The findings provide further evidence of the potential for pretrial instruments to inform pretrial decisions. These findings are a direct response to the critiques that pretrial instruments are inherently biased due to differential arrest and conviction rates by race. Despite little evidence of inherent bias in pretrial assessments, we do find that significantly more Black people are scored as high risk, and this finding needs careful exploration.

Prior research demonstrated that pretrial assessments are valid and lack evidence of predictive bias (Desmarais et al., 2021) and assessments have the potential to increase the number of people released (Kleinberg et al., 2018). However, mean score differences by race persists. The current study is one that provides a potential remedy to mean score differences by demonstrating a relatively simple adjustment to scoring pretrial instruments. Our findings offer a practical approach that is relatively easy to implement in the real-world as it is easier for court professionals to score 5-year histories than lifetime histories. Of course, we caution people from taking our findings to make sweeping changes to how pretrial instruments are scored. Rather, we suggest that replication studies are needed to test the veracity of these findings to determine if they are applicable in other communities. If these findings hold up to replication, pretrial instruments could prove to be a useful tool to ease the overreliance on pretrial detention.
References

https://www.apa.org/science/programs/testing/standards


Table 1: Description of the analytical sample by race.

<table>
<thead>
<tr>
<th></th>
<th>Black People</th>
<th>White People</th>
<th>Total People</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. (%(Mean)</td>
<td>No. (%(Mean)</td>
<td>No. (%(Mean)</td>
</tr>
<tr>
<td><strong>Primary Outcome</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New criminal arrest</td>
<td>4,278 25.5</td>
<td>647 20.4</td>
<td>4,925 24.7</td>
</tr>
<tr>
<td><strong>Prettrial Status</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Detained</td>
<td>11,668 41</td>
<td>1,885 37.3</td>
<td>13,553 40.5</td>
</tr>
<tr>
<td>Released</td>
<td>16,777 59</td>
<td>3,169 62.7</td>
<td>19,946 59.5</td>
</tr>
<tr>
<td><strong>Other Pretrial Outcomes</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New violent criminal arrest</td>
<td>1,344 8.0</td>
<td>152 4.8</td>
<td>1,496 7.5</td>
</tr>
<tr>
<td>Failure to appear</td>
<td>2,837 16.9</td>
<td>450 14.2</td>
<td>3,287 16.5</td>
</tr>
<tr>
<td><strong>Characteristics</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age at booking</td>
<td>22,425 78.8</td>
<td>3,728 73.8</td>
<td>26,153 78.1</td>
</tr>
<tr>
<td>Male</td>
<td>28,445 100</td>
<td>5,054 100</td>
<td>33,499 100</td>
</tr>
<tr>
<td><strong>Most serious current charge</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Arrested – Other</td>
<td>2,150 7.6</td>
<td>377 7.5</td>
<td>2,527 7.5</td>
</tr>
<tr>
<td>Drug Offenses</td>
<td>5,244 18.4</td>
<td>1,005 19.9</td>
<td>6,249 18.7</td>
</tr>
<tr>
<td>Other Offenses</td>
<td>26 0.1</td>
<td>3 0.1</td>
<td>29 0.1</td>
</tr>
<tr>
<td>Property Offenses</td>
<td>8,772 30.8</td>
<td>1,621 32.1</td>
<td>10,393 31</td>
</tr>
<tr>
<td>Public Order Offenses</td>
<td>2,687 9.4</td>
<td>593 11.7</td>
<td>3,280 9.8</td>
</tr>
<tr>
<td>Violent Offenses</td>
<td>9,566 33.6</td>
<td>1,455 28.8</td>
<td>11,021 32.9</td>
</tr>
</tbody>
</table>

Notes: 33,499 jail bookings at the Jail between 2017 and 2018. All chi-square statistics are different at the p < 0.001 level.
Table 2: PSA criminal history factors by race for different recall periods

<table>
<thead>
<tr>
<th>Recall Year</th>
<th>Black N</th>
<th>White N</th>
<th>Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Prior Misdemeanor Conviction</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>25%</td>
<td>7,126</td>
<td>21%</td>
</tr>
<tr>
<td>5</td>
<td>40%</td>
<td>11,268</td>
<td>34%</td>
</tr>
<tr>
<td>8</td>
<td>47%</td>
<td>13,497</td>
<td>40%</td>
</tr>
<tr>
<td>10</td>
<td>50%</td>
<td>14,361</td>
<td>42%</td>
</tr>
<tr>
<td>Lifetime</td>
<td>58%</td>
<td>16,426</td>
<td>49%</td>
</tr>
<tr>
<td><strong>Prior Felony Conviction</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>12%</td>
<td>3,357</td>
<td>8%</td>
</tr>
<tr>
<td>5</td>
<td>23%</td>
<td>6,539</td>
<td>15%</td>
</tr>
<tr>
<td>8</td>
<td>31%</td>
<td>8,791</td>
<td>19%</td>
</tr>
<tr>
<td>10</td>
<td>34%</td>
<td>9,582</td>
<td>20%</td>
</tr>
<tr>
<td>Lifetime</td>
<td>41%</td>
<td>11,676</td>
<td>24%</td>
</tr>
<tr>
<td><strong>Prior Violent Conviction</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>8%</td>
<td>2,245</td>
<td>4%</td>
</tr>
<tr>
<td>5</td>
<td>16%</td>
<td>4,521</td>
<td>7%</td>
</tr>
<tr>
<td>8</td>
<td>22%</td>
<td>6,306</td>
<td>10%</td>
</tr>
<tr>
<td>10</td>
<td>25%</td>
<td>7,101</td>
<td>11%</td>
</tr>
<tr>
<td>Lifetime</td>
<td>35%</td>
<td>9,829</td>
<td>16%</td>
</tr>
<tr>
<td><strong>Prior Sentence to Incarceration (14 Days or More)</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>12%</td>
<td>3,297</td>
<td>6%</td>
</tr>
<tr>
<td>5</td>
<td>20%</td>
<td>5,614</td>
<td>10%</td>
</tr>
<tr>
<td>8</td>
<td>26%</td>
<td>7,273</td>
<td>12%</td>
</tr>
<tr>
<td>10</td>
<td>28%</td>
<td>7,934</td>
<td>13%</td>
</tr>
<tr>
<td>Lifetime</td>
<td>34%</td>
<td>9,706</td>
<td>16%</td>
</tr>
</tbody>
</table>

Note: 33,499 jail bookings at the Jail between 2017 and 2018. All values are significant at the p < 0.000 level.
Table 3: Comparing the Predictive Validity of the NCA Scale Scored with Time-Specific Criminal History Items to the NCA Scale Scored with Lifetime Criminal History Items.

<table>
<thead>
<tr>
<th>Recall Period For CH Items</th>
<th>Time-Specific AUC</th>
<th>Lifetime AUC</th>
<th>p-value</th>
<th>Difference</th>
<th>Better AUC performance</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-year</td>
<td>0.6134</td>
<td>0.6527</td>
<td>0.0000</td>
<td>-0.0393</td>
<td>Total</td>
</tr>
<tr>
<td>2-year</td>
<td>0.6293</td>
<td>0.6527</td>
<td>0.0000</td>
<td>-0.0234</td>
<td>Total</td>
</tr>
<tr>
<td>3-year</td>
<td>0.6399</td>
<td>0.6527</td>
<td>0.0001</td>
<td>-0.0128</td>
<td>Total</td>
</tr>
<tr>
<td>4-year</td>
<td>0.6504</td>
<td>0.6527</td>
<td>0.4310</td>
<td>-0.0023</td>
<td>Total</td>
</tr>
<tr>
<td><strong>5-year</strong></td>
<td><strong>0.6554</strong></td>
<td><strong>0.6527</strong></td>
<td><strong>0.3140</strong></td>
<td><strong>0.0027</strong></td>
<td><strong>Time-Specific</strong></td>
</tr>
<tr>
<td>6-year</td>
<td>0.6607</td>
<td>0.6527</td>
<td>0.0012</td>
<td>0.0080</td>
<td><strong>Time-Specific</strong></td>
</tr>
<tr>
<td>7-year</td>
<td>0.6619</td>
<td>0.6527</td>
<td>0.0001</td>
<td>0.0092</td>
<td><strong>Time-Specific</strong></td>
</tr>
<tr>
<td>8-year</td>
<td>0.6626</td>
<td>0.6527</td>
<td>0.0000</td>
<td>0.0099</td>
<td><strong>Time-Specific</strong></td>
</tr>
<tr>
<td>9-year</td>
<td>0.6622</td>
<td>0.6527</td>
<td>0.0000</td>
<td>0.0095</td>
<td><strong>Time-Specific</strong></td>
</tr>
<tr>
<td>10-year</td>
<td>0.6607</td>
<td>0.6527</td>
<td>0.0000</td>
<td>0.0080</td>
<td><strong>Time-Specific</strong></td>
</tr>
</tbody>
</table>

*Notes: 19,946 jail bookings at the jail between 2017 and 2018. "CH" = Criminal History. The table shows the differences in AUC in models that use the Public Safety Assessment's NCA scale to predict NCA during pretrial detention. The time-specific AUCs are produced from models relying on different recall periods for the criminal history items on the NCA scale.*
Table 4: Assessing the Differential Prediction of the NCA scale by Race Across the Criminal History Recall Periods.

<table>
<thead>
<tr>
<th></th>
<th>1 year</th>
<th>2-year</th>
<th>3-year</th>
<th>4-year</th>
<th>5-year</th>
<th>6-year</th>
<th>7-year</th>
<th>8-year</th>
<th>9-year</th>
<th>10-year</th>
<th>Lifetime</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>White</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Odds Ratio</td>
<td>0.70*</td>
<td>0.71*</td>
<td>0.72</td>
<td>0.71</td>
<td>0.73</td>
<td>0.71</td>
<td>0.72</td>
<td>0.75</td>
<td>0.74</td>
<td>0.73</td>
<td>0.65*</td>
</tr>
<tr>
<td>Standard Error</td>
<td>(0.07)</td>
<td>(0.07)</td>
<td>(0.08)</td>
<td>(0.08)</td>
<td>(0.08)</td>
<td>(0.08)</td>
<td>(0.08)</td>
<td>(0.08)</td>
<td>(0.08)</td>
<td>(0.08)</td>
<td>(0.07)</td>
</tr>
<tr>
<td><strong>NCA Score</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Odds Ratio</td>
<td>1.50*</td>
<td>1.54*</td>
<td>1.56*</td>
<td>1.58*</td>
<td>1.58*</td>
<td>1.59*</td>
<td>1.58*</td>
<td>1.57*</td>
<td>1.56*</td>
<td>1.55*</td>
<td>1.48*</td>
</tr>
<tr>
<td>Standard Error</td>
<td>(0.03)</td>
<td>(0.02)</td>
<td>(0.02)</td>
<td>(0.02)</td>
<td>(0.02)</td>
<td>(0.02)</td>
<td>(0.02)</td>
<td>(0.02)</td>
<td>(0.02)</td>
<td>(0.02)</td>
<td>(0.02)</td>
</tr>
<tr>
<td><strong>White*NCA Score</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Odds Ratio</td>
<td>1.09</td>
<td>1.09</td>
<td>1.09</td>
<td>1.10</td>
<td>1.09</td>
<td>1.11</td>
<td>1.11</td>
<td>1.09</td>
<td>1.10</td>
<td>1.11</td>
<td>1.16*</td>
</tr>
<tr>
<td>Standard Error</td>
<td>(0.05)</td>
<td>(0.05)</td>
<td>(0.05)</td>
<td>(0.05)</td>
<td>(0.05)</td>
<td>(0.05)</td>
<td>(0.05)</td>
<td>(0.05)</td>
<td>(0.05)</td>
<td>(0.05)</td>
<td>(0.05)</td>
</tr>
</tbody>
</table>
| **Notes**: 19,946 jail bookings at the Jail between 2017 and 2018. Table shows the differences in coefficients in a model that interacts a year specific NCA score with race to examine the relationships with the dependent variable of NCA. * = p < 0.001

<table>
<thead>
<tr>
<th>Model Fit Statistics</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>ll</td>
<td>-10758.33</td>
<td>-10665.33</td>
<td>-10604.91</td>
<td>-10544.02</td>
<td>-10514.58</td>
<td>-10487.52</td>
<td>-10480.09</td>
<td>-10483.02</td>
<td>-10491.73</td>
<td>-10505.55</td>
<td>-10579.31</td>
</tr>
<tr>
<td>chi2</td>
<td>779.87</td>
<td>965.87</td>
<td>1086.70</td>
<td>1208.48</td>
<td>1267.36</td>
<td>1321.48</td>
<td>1336.33</td>
<td>1330.48</td>
<td>1313.07</td>
<td>1285.43</td>
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</tr>
<tr>
<td>aic</td>
<td>21524.66</td>
<td>21338.66</td>
<td>21217.83</td>
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<td>21037.17</td>
<td>20983.05</td>
<td>20968.19</td>
<td>20974.05</td>
<td>20991.46</td>
<td>21019.10</td>
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</tr>
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<td>bic</td>
<td>21556.26</td>
<td>21370.26</td>
<td>21249.43</td>
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<td>20999.80</td>
<td>21005.65</td>
<td>21023.06</td>
<td>21050.70</td>
<td>21198.23</td>
</tr>
</tbody>
</table>

Electronic copy available at: https://ssrn.com/abstract=4615029
Figure 1: Comparing the AUCs and Proportion Scoring High Risk (4 or more) Using the Specified Recall Period for Criminal History Items by Racial Heritage.

Panel A: AUCs by Recall Period
Panel B: Proportion Scoring High Risk by Recall Period