

Pretrial risk assessment instruments in practice: The role of judicial discretion in pretrial reform

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Abstract

Research Summary: We explored the extent to which the implementation of a pretrial risk assessment instrument (PRAI) corresponded to changes in the pretrial processing of defendants using multiple administrative data sources from a large county in the southeastern United States. Our findings revealed little evidence of reductions in detention lengths or increases in the use of nonfinancial forms of release following the tool's adoption. This was largely attributable to the exercise of judicial discretion, as judges frequently departed from the tool's recommendation using alternatives that were more punitive and often included financial conditions—particularly for Black and Latino defendants. Furthermore, the exercise of discretion was linked to increased rates of pretrial failure.

Policy Implications: PRAIs were adopted on a massive scale with the understanding that they are evidence-based and geared toward efficiently and equitably reducing pretrial populations; however, we are lacking the evaluative work to determine their impacts. Our findings suggest that PRAIs may not only undermine reform efforts, but may worsen disparities, if communities fail to complete the up-front work of discussing their expectations for pretrial decision making, including the

conditions under which financial constraints may be justifiable.

KEYWORDS

criminal justice reform, jails, judicial decision making, risk assessment

Over the past several years, a consensus has been reached on the multiple negative consequences resulting from the overuse of incarceration by the United States. The United States incarcerates at a level more than seven times that of its peers (Wagner & Sawyer, 2018). And despite modest declines (17%) over the last decade, we continue to incarcerate our population at a rate of 419 per 100,000 U.S. residents (Carson, 2020). Should we aspire to achieve a level of incarceration that is comparable to other democratic nations, we will need to adopt reforms that promise more than incremental change. Since its peak in 2007, we have witnessed an expanding discourse on criminal justice reform—focusing first on prisons, followed by a more recent emphasis on policing. This has naturally led to reform strategies that center on the arrest (e.g., diversion) and sentencing (e.g., alternatives to incarceration) stages of the criminal justice process. Yet we have largely ignored what happens to defendants after arrest and before adjudication and sentencing—thus neglecting jails and the growing population of pretrial defendants that has resulted from pretrial policies that punish poverty.

Although the jail population has declined slightly since its peak in the mid-2000s, the current rate represents an approximately 200% increase over the last three decades. This observed growth is almost entirely attributable to the rising number of pretrial detainees (Stephen, 1984; Zeng & Minton, 2021; see also Copp & Bales, 2018). Roughly two thirds of the men and women incarcerated in U.S. local jails are presumed innocent (Zeng & Minton, 2021), the majority of whom remain in jail due to their inability to post money bail. Given racial disparities in rates of jail incarceration, these changing patterns of jail usage have disproportionately impacted Black and Latino individuals. In light of this, there has been momentum behind a series of reform efforts aimed at decreasing rates of incarceration and addressing racial disparities. Pretrial risk assessment instruments (PRAIs) have emerged as one potential tool in reformers' tool kits to decrease pretrial detention rates and limit the disparities created by a reliance on financial forms of release (e.g., money bail) (see, e.g., Stevenson & Mayson, 2017a).

PRAIs are algorithmic tools that predict the likelihood of “pretrial failure” (i.e., failure to appear [FTA] and/or arrest for a new crime during the pretrial period) to help inform judges' decisions with respect to bail and other conditions of pretrial release. These tools are promoted on the promise that they will reduce jail populations. This assumes that decision makers, when presented with the tools' predictions, will observe that many defendants are less “risky” than they thought—and that they will alter their release/detention decisions accordingly. It also assumes that PRAIs are precise enough to distinguish between defendants on the basis of risk.¹

Over the last few years, PRAIs have become a source of considerable controversy, as critics have grown increasingly concerned over the predictions produced by such tools, as well as their potential role in perpetuating racial and ethnic disparities in the use of detention (e.g., Barabas et al., 2019; Koepke & Robinson, 2018; Mayson, 2019; Picard et al., 2019; Pretrial Justice Institute, 2020).² Yet most of the empirical literature is based on analyses documenting the tools' predictive accuracy (see Desmarais et al., 2021 for a recent review), with few studies considering the key

policy question of whether PRAIs have proven a fair and effective means of reducing jail populations in the jurisdictions where they have been adopted (see, e.g., Imai et al., 2020; Stevenson, 2018a). Rather, it appears that the collective enthusiasm for PRAIs propelled them into practice with little empirical consideration of their costs and benefits. There is a clear and pressing need for research that systematically explores the ways in which PRAIs have influenced local practices, including whether their adoption has helped communities move toward their reform goals. Findings from such research will be central to our understanding of the utility of PRAIs in ongoing jail reform efforts, including demonstrating whether these tools are indeed suitable and/or ready for widescale implementation.

In the current investigation, we employ data from multiple administrative sources in a large, southeastern county to examine the practical implications of pretrial risk assessment. We begin by presenting findings from a local validation of the Virginia Pretrial Risk Assessment Instrument—Revised (VPRAI-R) to demonstrate the reliability of the selected tool. Next, we consider how the PRAI adoption has influenced the pretrial processing of defendants in the county studied, comparing detention lengths and release mechanisms in the pre- and post-implementation periods. Finally, we examine the extent to which judicial decisions align with the PRAI recommendations and consider the nature of judicial overrides. We conclude with a discussion of “lessons learned,” including the importance of buy-in from system actors and community consensus on the desire to move from a “resource-based” system to a “risk-based” system. Given that it has become common practice for jurisdictions to append PRAIs to existing systems where money bail predominates, this discussion will focus particular attention on how jurisdictions’ continued reliance upon money bail complicates the implementation and evaluation of reform efforts, and impedes the realization of related risk-centered goals.

1 | PRETRIAL DETENTION IN THE UNITED STATES

Jails have been described as the “gateway” to the criminal justice system. Notably, although the average daily population of jails is much lower than prisons, jails admit roughly 18 times as many people as prisons on an annual basis (Copp & Bales, 2018). As of midyear 2019, the average daily population within our jails topped 750,000 (Zeng & Minton, 2021).³ What is perhaps even more striking than the sheer scope of jail incarceration in the United States is that more than two thirds of the jail population is comprised by individuals who have yet to be convicted of a crime (Schauffler et al., 2016). Although this figure includes individuals charged with serious, violent offenses, the majority of pretrial defendants have been accused of low-level nonviolent and public order offenses. Yet defendants routinely remain in jail due to their inability to post a money bail. This includes people who come from the poorest segments of society, and are disproportionately Black and brown (Rabuy & Kopf, 2016).

The share of jail inmates who are legally presumed innocent has skyrocketed in recent decades; in fact, more than 95% of jail population growth over the last 40 years is attributable to the rising pretrial population (Zeng, 2018). There are two notable shifts that shed light on these trends. First, there has been a dramatic decline in the use of nonfinancial forms of release. Although two in five defendants were released on nonfinancial terms in 1990, that number fell to just over one in four by 2009. Second, the average bail amount has roughly doubled over that same period (Hood & Schneider, 2019). According to recent estimates, the median bail amount equates to roughly 8 months of income for the average pretrial detainee (Rabuy & Kopf, 2016). It is thus unsurprising that ever larger shares of the pretrial population encounter difficulties in making bail. Even when

bail amounts are relatively low, many defendants remain in jail until their case is resolved. For example, roughly two fifths of defendants in New Orleans assigned a monetary bail of \$500 or less remained in jail for the full duration of their case (Laisne et al., 2017).⁴

These findings document that as the use of financial bonds has increased, jurisdictions have put in place few safeguards to ensure that their bail practices do not result in the unnecessary—and unconstitutional—detention of defendants pending adjudication. There is a critical need for research scrutiny on the pretrial processing of defendants in the United States, as current practices do not accord with the stated purpose of pretrial detention. Moreover, they result in the disparate treatment of defendants on the basis of wealth, perpetuating racial disparities in rates of detention based on a history of structural racism that legally excluded Black people from economic opportunity and continues into the present to inhibit people of color from accumulating wealth (see, e.g., Oliver & Shapiro, 2006). Yet the human toll of pretrial detention extends far beyond the immediate deprivation of pretrial liberty, as, by all accounts, what happens to defendants after arrest has major consequences for their later case outcomes and life chances.

In several recent studies, scholars have relied on methodologies, including instrumental variable approaches, to improve causal inference. Much of this work leverages the random assignment of judges to cases to examine the effects of pretrial detention and money bail on defendant outcomes (e.g., Dobbie et al., 2018; Gupta et al., 2016; Stevenson, 2018b). For example, Gupta and colleagues (2016) used data from Pittsburgh and Philadelphia to assess the effect of assigning a monetary bond (relative to a personal recognizance bond or nonfinancial conditions of release) on defendants' pretrial and case outcomes. They found that money bail increased defendants' likelihood of conviction. Further, their findings suggested that money bail had no measurable impact on rates of nonappearance, and that it may actually increase the likelihood of future crime. Stevenson (2018b), also relying on data from Philadelphia, similarly identified a link between the pretrial processing of defendants and case outcomes. In particular, she demonstrated that pretrial detention increases defendants' likelihood of conviction, and substantially lengthens custodial sentences. Moreover, pretrial detention increased the amount of fees owed to the court, suggesting that current pretrial practices may perpetuate the entrenchment of the most economically vulnerable defendants in the criminal justice system. Along a similar vein, Dobbie and colleagues (2018) found that pretrial detention increases defendants' likelihood of pleading guilty and reduces their likelihood of employment and access to social safety net programs (i.e., earned income tax credit). Thus, although these authors identified slight reductions in FTA and rearrest (due to the incapacitation effect of pretrial detention), these benefits came with notable collateral consequences. Furthermore, Dobbie and colleagues noted that the crime-inhibiting effects of pretrial detention were completely offset by increases in post-adjudication recidivism (see also Leslie & Pope, 2017).

In light of the notable consequences associated with pretrial detention, including the obvious and immediate impact on defendants' liberty, as well as the cascading criminal justice, social, and economic consequences that these practices set in motion, we have witnessed a flood of bail reform efforts across the country. The broad goals of these efforts are to reduce rates of pretrial detention and to address the race/ethnic disparities at the pretrial stage without contributing to increases in rates of court nonappearance or pretrial crime. Much of the reform debate has centered on the need to eliminate, or significantly curtail, the use of money bail, shifting instead toward a system where decisions are based on defendants' "risk." For the past few years, many of the leading voices within the more "system-focused" corner of the reform community have advocated for the use of actuarial risk assessments to undergird jurisdictions' risk-based decision making. In the following sections, we discuss how we ended up with a system where money bail

predominates and whether PRAIs appear to be living up to their promise of more consistent, efficient, and fair systems of pretrial justice.

2 | A BRIEF HISTORY OF BAIL IN THE UNITED STATES

After a person has been charged with an offense, and while they are awaiting adjudication on that charge, the state has a vested interest in preserving the integrity of the judicial proceedings. This includes making sure that people who have been arrested appear at their scheduled hearings and that they neither tamper with witnesses nor evidence (Stevenson & Mayson, 2017b). For much of U.S. history, risk of flight was the sole consideration when deciding bail, and since the early 1900s, money bail was the primary mechanism for ensuring court appearance (Schnacke, 2014). In its earlier iterations, the defendant would pay a deposit to the court, which would be returned following the resolution of their case, assuming they attended the required hearings. However, over time this system evolved to one in which secured bonds were often administered through commercial surety agents (i.e., bail bondsmen).

Early concerns with the bail system largely focused on prioritizing pretrial release. For example, in *Stack v. Boyle* the Supreme Court held that (1) defendants arrested for noncapital offenses should be eligible for bail, according to federal law; (2) defendants' right to release is "conditioned upon" their giving adequate assurance that they will attend the required proceedings; and (3) bail set higher than an amount required to fulfill such assurance is "excessive" according to the Eighth Amendment (*Stack v. Boyle*, 342 U.S. 1 [1951]). Although this ruling is primarily invoked in arguments on the issue of excessive bail, the opinion of the court in this matter also makes clear the emphasis on court appearance in bail determinations and the prioritization of release during the pretrial stage. Indeed, the wave of reforms that followed this decision was aimed at eliminating the unnecessary detention of indigent defendants held on low-level charges by creating a presumption of release (18 U.S.C. § 3146[a] [Supp. IV, 1969]). However, rising crime rates in the years that followed fueled a second wave of reforms and, by the 1970s, jurisdictions began to consider defendants' "dangerousness" at the pretrial stage (Goldkamp & Gottfredson, 1985). This practice was upheld by the Supreme Court (*United States v. Edwards*, 430 A.2d 1321, 1342–43 [D.C. 1981] [en banc]), and later in federal legislation (The Bail Reform Act of 1984 [18 U.S.C. §§ 3141–3150, 3156 53]), which allowed for pretrial detention in cases where no conditions would "reasonably assure" court appearance and public safety. Although implemented at the federal level, states soon adopted similar practices. As a result, all jurisdictions (except New York) consider court appearance and public safety in bail decisions (Goldkamp, 1985).⁵

In the period following these legislative changes, we have witnessed marked declines in the use of nonfinancial release mechanisms (e.g., personal recognizance bonds) (Hood & Schneider, 2019). Indeed, bail overtook personal recognizance bonds as the primary mode of release in the United States more than two decades ago—often through the use of a bail schedule—and bail amounts have steadily risen since (Neal, 2012). Because the majority of defendants cannot afford to post their bail in full, they call on for-profit bail companies for assistance. These private entities charge a premium for their services (typically 10%–15% of the bail amount) and take on responsibility for ensuring that the defendant appears in court. Each year, the commercial bail industry extracts hundreds of millions of dollars from the most economically vulnerable communities of the United States. In fact, recent estimates suggest that the bail bond industry brings in roughly \$2 billion in profit annually (American Civil Liberties Union, 2017). This financial burden is most typically borne by the women in defendants' social networks, including mothers, aunts,

grandmothers, and partners, providing a devastating example of how the consequences of these predatory practices extend far beyond the accused (Page et al., 2019). And yet there is no compelling scientific evidence to suggest that the use of money bail is more effective than other release mechanisms at protecting the states' interest—namely, court appearance and public safety. In fact, the existing research demonstrates that money bail is no more effective at preventing pretrial FTA and rearrest than nonfinancial forms of release (e.g., Ouss & Stevenson, 2019; Phillips, 2012). Furthermore, prior work establishes that secured bonds are no more effective than unsecured bonds at ensuring court appearance or public safety (Brooker et al., 2014; Jones, 2013), which suggests that bail bondsmen neither contribute to court efficiency nor enhance public safety, and yet they exact a harmful financial toll on individuals and their broader communities.

3 | THE PLACE OF PRAIS IN ONGOING BAIL REFORM EFFORTS

The context from which the current wave of bail reform emerged was characterized by pretrial populations that had expanded to roughly two thirds of the overall jail population and a commercial bail industry that had grown in both size and political prowess. Reformers, recognizing that pretrial populations were largely composed of people charged with low-level offenses who remained in jail due to their inability to pay a monetary bond, became focused on approaches that prioritized the release of people accused of misdemeanor crimes and certain low-level felonies. Risk assessments—which are widely used across the criminal justice system—were identified as a potential means to distinguish between the minority of people who were “high risk” requiring greater pretrial intervention and the larger group of people who needed fewer conditions for release (see e.g., Desmarais et al., 2021). These tools were widely promoted as an empirically based, technical approach to address U.S. overreliance on pretrial detention. Yet whether these tools are actually leading to reductions in pretrial detention—let alone increasing consistency, efficiency, and fairness in pretrial decision-making—remains unclear. We begin with a brief review of the existing PRAI validation research, followed by a discussion of findings from the more limited body of work on PRAI implementation, including a small handful of evaluation studies.

3.1 | Findings from PRAI validation, evaluation, and implementation research

There are currently dozens of PRAIs in use nationwide. Recent estimates suggest that nearly half of U.S. jurisdictions report the use of a pretrial risk assessment, and that roughly two thirds of the U.S. population resides in a jurisdiction that uses a PRAI (Lattimore et al., 2020; Pretrial Justice Institute, 2019). This reflects a more than twofold increase in the number of jurisdictions using a PRAI over a 3-year period (Pretrial Justice Institute, 2017). A broad overview of these tools is that they draw on demographic, social, and criminal justice information to predict defendants' likelihood of pretrial failure to appear or rearrest. Some tools combine these failure outcomes, whereas others present separate estimates; some collect this data through a combination of administrative data and defendant interviews, whereas others rely exclusively on system-generated information; and some report their findings using “low-,” “medium-,” and “high-risk” classifications, whereas others develop local decision-making matrices (akin to sentencing grids). Although the peer-reviewed literature on PRAIs is lacking, the existing validation scholarship suggests that

these tools are reliable predictors of pretrial failure (e.g., Cadigan et al., 2012; DeMichele et al., 2020; Lowder et al., 2020; see also Desmarais et al., 2021 for a recent review).

For example, the Public Safety Assessment (PSA), which is the most widely used PRAI in the United States, was recently revalidated (DeMichele et al., 2020). Findings from this effort determined that the tool was a reliable pretrial failure, based on reported area under the curve (AUC) estimates (AUC = 0.645) and, moreover, that it does not exacerbate racial disparities. Another widely used tool, the Virginia Pretrial Risk Assessment Instrument (VPRAI), and the more recently revised VPRAI-R have similarly been found to produce acceptable estimates of pretrial failure (Danner et al., 2015, 2016). However, the VPRAI-R appears to produce more accurate estimates of technical violations (AUC = 0.691) than either FTA or new arrest (AUC = 0.621 and 0.652, respectively), which is somewhat troubling given that court appearance and new criminal activity are the outcomes of greatest import to pretrial decision makers. PRAIs have also made their way into the federal system. Over a decade ago, researchers began the process of identifying predictors of pretrial risk and developing the Pretrial Risk Assessment (PTRA) (VanNostrand & Keebler, 2009). Relative to either the PSA or VPRAI, the PTRA exhibits the highest levels of predictive accuracy (0.689 and 0.721 for the combined FTA/new criminal activity and FTA/new criminal activity/technical violation outcomes, respectively). Indeed, the PTRA is, of the three most common PRAIs, the only one to achieve a level of predictive accuracy greater than 0.71, which is considered “excellent” in the field of criminal justice risk assessment. In sum, the findings of recent validation studies suggest that the three most widely used tools in the United States predict pretrial failure with acceptable levels of accuracy (Desmarais et al., 2021). Yet separate from the question of model performance is how these tools are being used in the courtroom, and whether their use has contributed to improved pretrial practices (i.e., decreased reliance on incarceration, reductions in race/ethnic disparities). Despite widespread adoption of these tools, the answers to these basic implementation questions remain largely unknown.

In a recent study, Stevenson (2018a) evaluated the impact of Arnold Ventures’ PSA on the pretrial processing of defendants in Kentucky. This was one of the first attempts to understand how the implementation of a PRAI influenced pretrial practices during this most recent wave of reforms. The author compared bond setting and release, as well as pretrial misconduct, during the pre- and post-implementation periods. She found no evidence of efficiency gains following the adoption of the PSA; that is, releases increased less than one percentage point during the post-implementation period, and no sharp changes in either FTA or pretrial rearrest were observed around the implementation date. She discussed a number of potential explanations for the null pattern of findings, including exaggerated claims about the gains in predictive accuracy achieved by assessment tools and the exercise of judicial discretion. However, she concluded that additional empirical research is needed to help unpack the effects of PRAIs in practice, noting “That one of the foremost examples of evidence-based criminal justice has advanced as far as it has with so little evidence on its impacts is a little unnerving” (Stevenson, 2018a, p. 376).

In another recent investigation, Imai and colleagues (2020) examined whether the use of a PRAI improved judicial decision making. As these authors note, much of the risk assessment debate is centered upon calculations of accuracy and fairness—and how to balance the two—rather than how PRAI recommendations shape judicial decisions (e.g., Berk et al., 2018; Kleinberg et al., 2017). The more limited research on PRAIs and human decision making is based on observational data or survey questions. As a result, the authors of the current investigation conducted a field experiment, in which the information from the PRAI was made available to judges at random. Accordingly, the authors were able to examine how the PRAI affected judges’ decisions and defendants’ outcomes. They found that the PRAI resulted in negligible reductions in failures to appear

and pretrial rearrest and, moreover, that judges' decisions were less fair with respect to race and gender when provided with the PRAI.⁶ These findings accord with those of Stevenson (2018a), as the PRAI was largely unrelated to pretrial misconduct. However, they also raise concerns regarding the fairness of judges' decisions within the PRAI context. As this experiment reveals, the exercise of judicial discretion has the potential to infuse racial bias in practice—even when scholars have demonstrated that the predictions themselves are race neutral. Yet even more fundamentally, it reveals that the use of an algorithmic tool does not inherently improve judicial decision making. Instead, PRAIs provide a veneer of objectivity, while still being subject to many of the same flaws and biases as human decision making and operating under the guise of evidence-based practice.

In contrast, findings of a third recent study present a more optimistic view of the potential of PRAIs in practice (Lowder et al., 2021). Specifically, Lowder and colleagues (2021) conducted a multisite, quasi-experimental investigation of the impact of PRAIs on judges' decisions and defendants' outcomes. Using a series of propensity score analyses, the authors demonstrated that PRAIs increased the likelihood of nonfinancial release. Relatedly, the defendants in the PRAI condition spent less time in pretrial detention. Nevertheless, this increase in pretrial release came with its own trade-offs, as rates of nonviolent rearrests also increased among defendants with a PRAI. The authors concluded that their study findings underscore the potential of PRAIs to help jurisdictions achieve lower rates of pretrial detention, and advocated for the use of structured guidelines to encourage the consistent use of risk assessment information in the judicial decision-making process.

Additional findings from the implementation science literature nicely complement the above, and provide some additional context for understanding why PRAI usage may not have the intended effect. In particular, multiple studies suggest that there is variability across courtroom workgroup members in the extent to which PRAIs are valued and/or contribute to recommendations (DeMichele et al., 2019; Terranova et al., 2020). Some of this has been attributed to the different roles of courtroom workgroup members, as well as a certain degree of misunderstanding of the tools' intended use. In general, it appears that judges and pretrial officers may be more inclined to adhere to recommendations than either prosecutors or defense attorneys. Yet although some have documented judicial adherence rates in the range of 80% (see, e.g., Danner et al., 2015), the broader consensus is that professionals are not consistent in their adherence to the recommendations of assessment technologies (see Viljoen et al., 2019 for a systematic review).

In sum, these prior findings present a mixed portrait, at best, of the potential for PRAIs to encourage safe and equitable reductions in pretrial detention, and raise several additional questions regarding the predictive power of these technologies and the ways in which they are used to inform judicial decisions.⁷ Given the widespread use of these tools, and the very limited research on PRAI implementation and practice implications, the current investigation seeks to further contribute to our understanding of how PRAIs have affected pretrial processes in a community setting.

3.2 | Current study

In the current investigation, we draw upon multiple administrative sources from a large jurisdiction in the southeastern United States to examine the practical implications of the VPRAI-R implementation. Much of what we know about PRAIs comes from research on the development and validation of these tools. Our focus on several back-end considerations moves in a more fundamental way from this existing research. Although the methods and statistical techniques used

to develop PRAIs, and the policy simulations that have attempted to assess their impact, form key pieces of our risk assessment knowledge base, it is also critical to consider whether these tools have proven effective in practice. The current study examines whether the adoption of a PRAI has contributed to improvements in the pretrial process. This type of evaluative work is desperately needed, as PRAIs have been adopted on a massive scale under the “evidence-based” moniker, yet we lack a clear understanding of whether these tools “work” in their actual application.

To provide some context for our evaluative work, we begin by presenting basic findings from our local PRAI validation. From there, we compare and contrast trends in bond setting and detention length during the pre- and post-implementation periods to determine whether the adoption of a PRAI corresponds to increases in the use of nonfinancial release and/or reductions in overall pretrial detention lengths. Next, we consider how judges use the tools in their decision-making processes by considering the extent to which judicial decisions accord with PRAI recommendations, and the conditions under which judges tend to depart from these recommendations. We conclude with a general discussion of “lessons learned” and thoughts on the future of PRAIs in efforts to develop a more equitable system of pretrial justice.

3.3 | Data and methods

The current investigation relies on data from a large jurisdiction in the southeastern United States that is characterized by high levels of racial and socioeconomic diversity. In particular, just over half of the population is non-Latino White (54%), roughly one quarter of residents are Latino (23%), and one in five are Black (20%). Nearly two fifths of residents over the age of 25 have a college degree (37%); however, greater than one in 10 residents live below the poverty line (11%) (U.S. Census Bureau, 2019). The jurisdiction’s arrest rates for violent (389.7 per 100,000) and property (2205.2 per 100,000) crime are slightly above national estimates (violent = 366.7 per 100,000; property = 2109.9 per 100,000) (Federal Bureau of Investigation, 2020; Florida Department of Law Enforcement, 2019).

Our analyses drew on data from four administrative sources, including the jail, the courts, pretrial services, and a statewide rearrest database. Data from the jail include current arrest characteristics, demographic characteristics, and information regarding jail bookings and releases. These data were originally provided at the charge level and were collapsed by individual identifier and booking date, which allowed us to focus on individual booking events. When an individual faced additional charges related to that booking incident at a later point in time, these charges were considered part of the same booking event. This enabled us to retain the most serious charge and to identify whether defendants faced multiple charges. Data from pretrial services include the defendant’s calculated risk score, the associated risk level, and the individual risk factors. The data were also used to determine whether the defendant committed any technical violations during the pretrial period. These data were provided at the first appearance hearing level and were collapsed by individual identifier and booking date. In instances where there were multiple first appearances for the same identifier and booking date, the most recent first appearance was retained. Data from the courts were used to identify failures to appear and case disposition information. The rearrest information was collected from the state’s Statistical Analysis Center and was used to capture any new criminal activity during the pretrial release period.

Our analyses focused on all bookings into the local jail during the period from September 1, 2017 to December 31, 2019.⁸ The original jail booking file was provided at the charge level, and included 139,377 observations during the study period. After collapsing the file to the booking

level and retaining the most serious charge associated with each booking event, we were left with 61,685 observations. We excluded observations where the defendant was held for another jurisdiction, where the booking was for a probation or parole violation, or where the charges were not filed ($n = 9830$). We further limited our sample to defendants identified as non-Latino White, non-Latino Black, and Latino, as small cell sizes precluded analyses of other racial and ethnic groups ($n = 5$). In order to combine our booking file with the other county-level data sources, we further restricted our sample to observations with valid clerk data ($n = 7568$ observations excluded). Finally, we removed observations with invalid booking, release, or disposition dates ($n = 4023$), and retained those observations with valid PRAI and first appearance data ($n = 19,953$ observations excluded). The final analytic sample ($n = 20,306$) contains defendants who were booked between September 1, 2017 and December 31, 2019, attended a bail hearing, and had valid data on the risk factors included in the PRAI.⁹

3.4 | Measures

3.4.1 | Pretrial failure

FTA was a dichotomous variable indicating whether the defendant failed to appear for any of their scheduled hearings during the pretrial period, and was drawn from the Clerk of Court's warrant data. We identified cases where a *capias* warrant was issued as an *FTA* (1 = yes). *New arrest* assessed whether individuals were arrested for a new crime during the pretrial release period. This was taken from the statewide rearrest database, and indicates whether individuals were arrested following their initial release and prior to the final disposition of their case (1 = yes). We measured *technical violation* using data from the local pretrial services agency using an indicator of whether an individual violated their conditions of supervised pretrial release (1 = yes). A composite measure, *any failure*, captured whether an individual exhibited any of these three failure types (i.e., *FTA*, *new arrest*, *technical violation*) (1 = yes). These measures were tracked across individuals' pretrial release period, from the time of release to the final disposition of their case.

3.4.2 | Judicial decisions

We created five dichotomous indicators to capture the different judicial decisions rendered in the first appearance courtroom. *Own recognizance (OR) release* reflects the judges' decision to release defendants to the community without the requirement of posting bail. *Supervised own recognizance (SOR) release* entails the use of court-ordered supervision, under the management of pretrial services, as a condition of release. In the focal jurisdiction, pretrial services offer four levels of pretrial release, with level IV being the most intensive, requiring weekly in-person reporting. Additional conditions, such as alcohol and drug testing, may be applied at the judges' discretion. Judges may also combine *SOR* with financial release options. For example, *SOR/alt* allows defendants to choose between supervised pretrial release or paying money bail, whereas *SOR+* requires that the defendant be supervised by pretrial services in addition to posting a monetary bond. Finally, *bond only* captures judges' decision to impose a financial condition on a defendants' release, requiring them to pay a set financial amount prior to being released to the community.

3.4.3 | Matrix recommendations

In the focal jurisdiction, a locally designed Pretrial Risk Management Matrix (PRMM) was developed for use, in conjunction with information on a defendant's current offense, to help guide judges' courtroom decisions (see Table A1). The PRAI risk levels run along one axis of the matrix, and the other axis includes current offense characteristics (e.g., non-violent misdemeanor, driving under the influence (DUI), nonviolent felony, violent misdemeanor, and violent felony). For example, defendants charged with nonviolent misdemeanors who are assessed as low risk are recommended OR release. As the charge seriousness or assessed risk level increases, the recommendations shift to more intensive forms of supervision including SOR levels I–IV. The outer perimeter of cells, which includes violent felony charges and defendants assessed as high risk, is recommended “per court,” meaning that there is no particular recommendation. Taken together, the different matrix recommendations include OR, SOR I, SOR II, SOR III, SOR IV, and “per court.” In our analyses, we combined the SOR levels to create three dichotomous indicators, including *OR*, *SOR*, and “*per court*.”

3.4.4 | Judicial departures

Although the matrix was developed to guide judicial decisions, the recommendations are advisory, and judges ultimately have the discretion to depart from these recommended release options. In order to capture such departures, we created three dichotomous indicators, including departure from OR recommendation, departure from SOR recommendation, and money bond—a departure in its own right, as money bond is not presented as a release recommendation in the locally designed matrix. Accordingly, *departure from OR recommendation* includes observations where the judge applied SOR in lieu of the recommended OR release. *Departure from SOR recommendation* includes observations where the judge applied OR in lieu of the recommended SOR release. *Money bond* includes observations where the judge recommended a financial release mechanism, which necessarily reflects a departure from the matrix recommendation.

3.4.5 | Independent variables

We included a series of criminal history and current charge characteristics, taken from the VPRAI-R, based on prior literature linking these factors to pretrial failure and judicial decision making (Danner et al., 2015, 2016). These included whether the defendant was *on active community supervision*, whether the current charge was a felony (*felony charge*), and if the defendant had any *pending charges* at the time of their first appearance. *Criminal history* is a dichotomous indicator signaling whether the defendant has one or more misdemeanor or felony convictions. We measure *violent convictions* based on whether the defendant has two or more violent convictions. Prior court appearance is measured using a single indicator assessing whether the defendant has missed two or more prior hearings, 2+ *prior FTAs*. We include two additional items from the VPRAI-R, *unemployed at time of arrest* and *history of substance use*. In addition to these VPRAI-R risk factors, we include the following defendant sociodemographic characteristics: *age* (continuous in years),

gender (male = 1), and three dichotomous indicators for *race/ethnicity* including non-Latino White (contrast category), non-Latino Black, and Latino.

3.5 | Analytic strategy

Our analyses proceeded in several stages. In the first stage, we presented descriptive statistics for the full sample, by pretrial release status (i.e., whether an individual was released at some point prior to the disposition of their case). Next, we presented findings from our local validation of the VPRAI-R. These analyses necessarily focused on the subset of individuals who were released pretrial, and provide information on the risk classification of sample members and the overall performance of the VPRAI-R in the focal jurisdiction based on sample descriptives, logistic regression models, and AUC estimates. In a third stage, we compared patterns of release and detention length during the study period with a comparison window directly preceding the VPRAI-R implementation (May 1, 2015 to August 31, 2017). These basic trends provide a broad overview of the extent to which the PRAI has influenced local practices. In a final stage, we “zoom in” on the judicial decision-making process to explore the extent to which judges adhere to the PRAI recommendations, and the conditions under which they depart. Analyses in this final stage included crosstabs, multinomial logistic, and logistic regression analyses. The various analyses are described in additional detail in the sections to follow.

4 | RESULTS

4.1 | Sample description

Table 1 presents descriptive statistics for the full sample, by pretrial release status.¹⁰ The average age of defendants at the time of booking was roughly 36. The majority of defendants were male (75%), and roughly one quarter were female (25%). More than four fifths of sample members were unmarried at the time of booking (86%). White and Black defendants made up an equal share of bookings, with each group comprising just over 40% of the sample. The remainder of defendants (16%) were Latino. The most serious charge in the vast majority of bookings was either a nonviolent felony or misdemeanor (86%); however, the remaining 14% of bookings included a charge for a violent felony. We also included the different risk levels from the VPRAI-R, which ranged from lowest (1) to highest (6) risk. More than half of sample members (51%) were assessed as “low risk” (levels 1 and 2), and fewer than one in 10 (9%) were assessed as “high risk” (levels 5 and 6).

4.2 | Local PRAI validation

The focal jurisdiction adopted a validated PRAI, the VPRAI-R, which was implemented in the fall of 2017. After a period of implementation, we performed a local validation to determine whether the PRAI accurately predicted pretrial failure among defendants released from the local jail. In the focal jurisdiction, the release mechanisms included money bail (cash, surety), supervised pretrial release (SOR), and own recognizance release (OR). Our analyses focused on four indicators of pretrial failure—FTA, pretrial rearrest, technical violation, and an overall indicator of “any failure.” The selected tool included eight risk factors: (1) active community supervision, (2) charge

TABLE 1 Sample descriptive statistics

	Mean/ percentage	SD	Range	Released pending adjudication		Detained until case disposition
Demographic characteristics						
Age	35.63	12.83	15–93	34.61	***	38.10
Gender						
Male	74.98%			71.76%	***	82.66%
(Female)						
Marital status						
Married	13.85%			16.30%	***	8.00%
(Unmarried)						
Race/Ethnicity						
(Non-Latino White)	41.39%			42.43%		38.90%
Non-Latino Black	43.06%			42.34%	***	44.76%
Latino	15.55%			15.22%	**	16.34%
Citizenship status						
Citizen	85.85%			85.18%	***	87.43%
(Noncitizen)						
Current arrest characteristics						
Violent felony	13.87%			13.93%		13.74%
Nonviolent felony	39.95%			43.85%	***	30.65%
Misdemeanor	46.17%			42.22%	***	55.61%
Risk level	2.58			2.31	***	3.22
1	29.80%			37.35%		11.79%
2	21.25%			23.14%		16.74%
3	21.56%			18.86%		28.00%
4	18.13%			13.97%		28.06%
5	7.30%			5.53%		11.51%
6	1.96%			1.15%		3.90%
Any failure				17.92%		
FTA	–			6.34%		–
New arrest	–			5.76%		–
Technical violation	–			5.82%		–
<i>N</i> =	20,306			14,309		5997

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

type, (3) pending charges, (4) criminal record, (5) two or more FTAs, (6) two or more violent convictions, (7) unemployed at the time of arrest, and (8) history of drug abuse. This information was collected during in-person interviews with pretrial services staff, and via online criminal justice databases. The risk factors were weighted and summed to calculate a pretrial risk score (0–14).¹¹ These scores were collapsed into pretrial risk levels, ranging from 1 to 6, which were then

TABLE 2 Pretrial failure, by VPRAI-R risk level ($n = 14,309$)

Risk levels (defendant's score)	Full sample		Any failure		FTA		New arrest		Technical violation	
	N	%	N	%	N	%	N	%	N	%
1 (0–2)	5344	37.35%	554	10.37%	219	4.10%	171	3.20%	164	3.07%
2 (3–4)	3311	23.14%	551	16.64%	195	5.89%	158	4.77%	198	5.98%
3 (5–6)	2698	18.86%	604	22.39%	230	8.52%	190	7.04%	184	6.82%
4 (7–8)	1999	13.97%	557	27.86%	191	9.55%	176	8.80%	190	9.50%
5 (9–10)	792	5.53%	234	29.55%	55	6.94%	100	12.63%	79	9.97%
6 (11–14)	165	1.15%	64	38.79%	17	10.30%	29	17.58%	18	10.91%
Base rate				17.92%		6.34%		5.76%		5.82%
AUC				0.634		0.592		0.638		0.624

provided to judges at defendants' initial appearance to inform judges' decisions with respect to bond and release conditions.

We focus here on the accuracy of the “risk level” estimates, as this is ultimately the information that lands in the hands of judges. This information was designated for use in a locally designed Pretrial Risk Management Matrix (PRMM), in conjunction with the offense type, to provide more explicit guidance regarding defendants' recommended release type and conditions (see Table A1). In Table 2, we present the sample distribution across the different risk levels, by pretrial failure. Notably, the sample includes only those defendants who were released at some point during the adjudication process ($n = 14,309$), as those detained were never “at risk” of pretrial failure. Consistent with prior research on local jails, we note that the majority of observations are categorized as “low risk” (levels 1 and 2), and relatively few defendants fell into the “high risk” categories (levels 5 and 6). More specifically, three fifths of defendants were categorized as low risk (60.49%), whereas less than 7% were categorized as “high risk.” The remaining one third of defendants (32.83%) were in the medium risk categories. Further, although the “Any failure” column signals a progressive increase in the odds of pretrial failure across the risk categories, it is noteworthy that fewer than one in three “high risk” defendants went on to fail during the pretrial period. In other words, an overwhelming majority of defendants successfully completed the pretrial period—by attending all required hearings, avoiding additional arrests, and complying with the conditions of their release—across all risk levels. Moreover, two thirds of all failures were due to failures to appear and technical violations, and thus did not involve the commission of a new crime.

In Table 2, we also provide an AUC estimate ($AUC = 0.634$) that was generated from a logistic regression model using the pretrial risk level to estimate the odds of pretrial failure. This AUC estimate was taken from the model predicting “any failure.”¹² AUC values in this range have been characterized as “fair” to “good” ($<0.55 = \text{poor}$; $0.55\text{--}0.63 = \text{fair}$; $0.64\text{--}0.71 = \text{good}$; $0.71\text{--}1.00 = \text{excellent}$; Desmarais & Singh, 2013), and are on par with levels of predictive accuracy of other widely used assessment tools.¹³ Thus, according to the existing metrics of classification in the criminal justice risk assessment literature, and based on comparisons with other validated tools, we concluded that this PRAI produces reasonably reliable estimates of pretrial failure, or at least performs comparably to other tools in the field.¹⁴

In light of concerns about differential predictions across racial and ethnic groups, we also estimated models predicting the odds of the different pretrial failure outcomes separately by

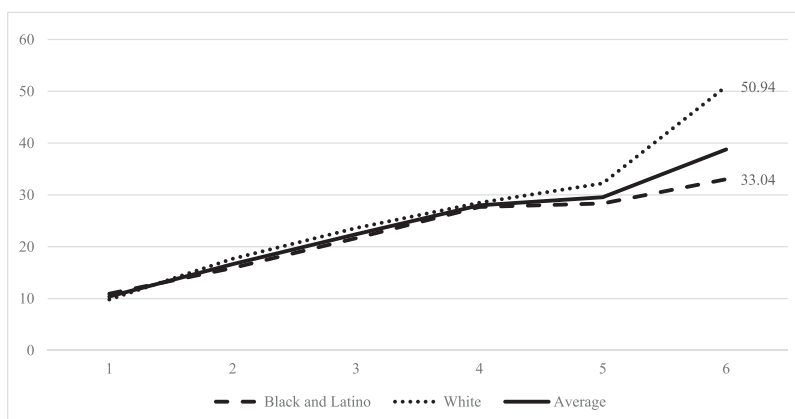


FIGURE 1 The risk of “any” pretrial failure across risk categories, by race/ethnicity

race/ethnicity. Focusing on the “any failure” outcomes, the estimates were slightly different across groups, such that the AUC values were 0.648, 0.624, and 0.604 for White, Black, and Latino individuals, respectively (not shown). In other words, it appeared that the tool was a slightly better predictor of pretrial failure for White individuals than their Black and Latino counterparts. In order to further unpack these differential predictions, we plotted the risk of “any” pretrial failure across risk categories, by race/ethnicity (Figure 1). Our findings revealed significant overlap in the percent who “failed” across categories 1 through 4, irrespective of race/ethnicity. However, among those in the high-risk categories (risk levels 5 and 6), a greater share of White individuals “failed” than either Black or Latino individuals. These findings suggest that this particular tool is more likely to misclassify Black and Latino defendants as high risk, as compared to White defendants, reinforcing scholarly concerns about risk assessment and racial bias (see also Picard et al., 2019).

4.3 | Trends in bond setting and detention length

Many jurisdictions that have adopted PRAIs spend considerable time and resources selecting a tool, and some even invest additional time and resources in conducting a local validation. Yet few jurisdictions do much evaluative work to determine how their tool has influenced local practices. Following our validation efforts, we were interested in exploring the practical implications of the PRAI. To accomplish this, we started by focusing on changes in release mechanisms and detention lengths during the pre- and post-implementation periods. Drawing on data across a nearly 5-year period, we compared monthly shares of defendants released in less than 3 days prior to and following the PRAI implementation. As shown in Figure 2, the monthly share of defendants released in less than 3 days was roughly 65%, and this figure appears largely stable across the pre- and post-implementation periods. However, we did observe a slight increase in the percentage of defendants released in less than 3 days in the PRAI context, as roughly 64% of monthly defendants were released in less than 3 days prior to the PRAI, as compared to nearly 67% following its adoption. This modest yet positive change in release patterns and detention lengths is consistent with expectations about the impacts of PRAIs.

In order to further dissect these patterns, we examined changes in the share of defendants released in less than 3 days by charge type (e.g., felony vs. misdemeanor). As others have noted



FIGURE 2 Monthly percentages released pretrial <3 days, before and after PRAI implementation [Color figure can be viewed at wileyonlinelibrary.com]

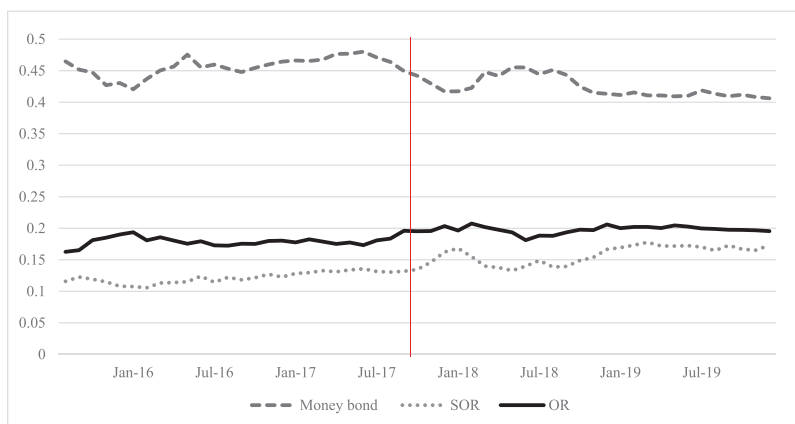


FIGURE 3 Monthly percentages released via money bail, supervised (SOR), and own recognition (OR) release before and after PRAI implementation [Color figure can be viewed at wileyonlinelibrary.com]

(Stevenson, 2018a), it is possible that a shift to greater risk-based decision making may result in lower release rates for high-risk defendants, while increasing release rates for low-risk defendants. Thus, the net change in releases may underestimate any positive impacts of the PRAI on release patterns for low-level defendants. Interestingly, our data revealed the opposite pattern; that is, the greater efficiency observed in the post-implementation period was concentrated among defendants charged with a felony. Conversely, the share of misdemeanor defendants released in less than 3 days declined in the period following the PRAI implementation (−1%). Again, these observed differences are substantively small, yet both the magnitude and direction of these changes suggest that the PRAI did not contribute to efficiency gains in the pretrial processing of defendants.

Given that PRAIs are marketed as bail reform tools, and their proponents have argued that they encourage “risk-based” as opposed to “wealth-based” decision making, we were especially interested in whether PRAI usage contributed to increases in nonfinancial forms of release. In Figure 3, we considered the monthly shares that were released via the following mechanisms: (1) money bail, (2) supervised own recognition (SOR) release, and (3) own recognition release

TABLE 3 Examining the correspondence between matrix recommendations and judicial decisions

	Judicial decisions ^a					Total
	OR	SOR	SOR/alt	SOR+	Bond only	
Matrix recommendations						
OR	1988	1151	267	137	707	4250
SOR	322	1247	704	368	2321	4962
“Per court”	341	876	423	496	2012	4148
Total	2651	3274	1394	1001	5040	13,360

^aCases were excluded from the above comparisons for the following reasons: (1) the judge held the defendant without bond; (2) the defendant did not receive a bond determination at their initial court appearance (e.g., the defendant’s first appearance hearing date was rescheduled); or (3) the case was adjudicated time served.

(OR). Across both periods, we found that the modal release mechanism was money bail. However, the percentage of pretrial defendants released via money bail declined slightly (4%) in the post-implementation period. Similarly, the percent released on their own recognizance or to pretrial services (SOR) increased marginally in the PRAI context (2% and 4%, respectively). At first glance, these patterns suggest the judges are opting for nonfinancial forms of release in lieu of money bail in a very small minority of cases. Although negligible, these patterns at least reflect a shift in the direction of the local community’s reform goals. However, upon further inspection, we found that judges had added a financial component to a large share of the defendants granted release with conditions (SOR). More specifically, judges frequently allowed defendants to choose between SOR and money bail (SOR/alt) or required that a financial bond be posted in addition to the SOR release conditions (SOR+). Altogether, two fifths of SOR decisions involved money, and one in five were ineligible for release without payment of a monetary bond. This more nuanced inspection of our data revealed that the small declines in money bail observed during the post-implementation period were offset by the increases in SOR release, where many defendants were required to not only comply with a number of release conditions, but were often required to post a set dollar amount as well.

4.4 | Judicial decision making in the PRAI context

In the next stage of the analyses, we focused on the post-implementation period to explore judicial decision making in the context of a PRAI (see Table 3). The local decision-making matrix designed to inform judges’ pretrial decisions includes recommendations of OR release, four distinct levels of supervised release, and a “per court” category, where judges are encouraged to use their discretion to apply the appropriate release decision. The “per court” cells fall into the outer perimeter of the matrix, and correspond to the highest risk levels and/or most serious current charges. In these analyses, we focused on all cases that received a risk assessment recommendation and a judicial decision with respect to bail (e.g., OR, SOR, money bail).

Focusing first on the OR recommendations, which comprised approximately 32% of PRAI recommendations, we found that judges adhered to those less than half of the time (47%). The most common departure was to supervised release (37% of OR recommendations).¹⁵ Among those who were remanded to SOR, nearly three in five (58%) were assigned to the most intensive levels (3 and 4). An additional 17% of defendants recommended OR release were assigned a monetary bond, and if we include those who were required to post bond as a condition of their supervised release

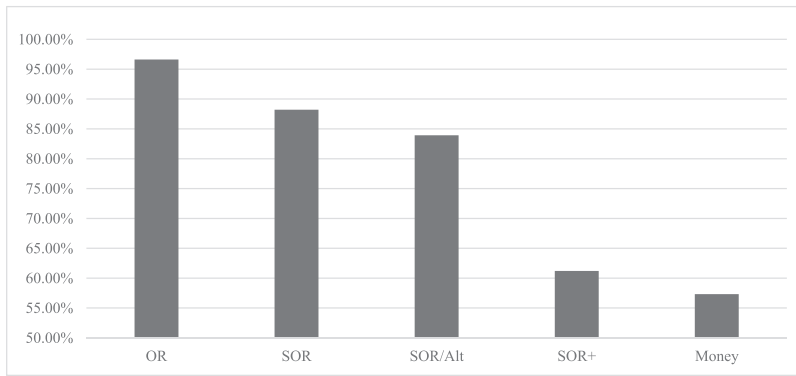


FIGURE 4 Percent of defendants released within 3 days of booking, by release mechanism

(SOR+), this figure increases to one in five. Thus, judges just as frequently imposed something more restrictive as they complied with the PRAI recommendations for OR release.

Rates of compliance were even lower when focusing on recommendations of SOR release. Although SOR release recommendations made up nearly two in five (37%) PRAI recommendations, judges' decisions strictly aligned with these recommendations in one in four cases (25%). Notably, judges assigned money bail more frequently than they accorded with SOR recommendations, as nearly half of defendants recommended SOR release were assigned money bail (47%). They also applied monetary conditions to SOR in an additional 22% of cases, by allowing defendants to choose between money bail and SOR (SOR/alt; 14%) or requiring a financial bond be posted in addition to SOR (SOR+; 7%). To the extent that these departures restricted defendants' pretrial liberty by increasing barriers to pretrial release, the vast majority of judicial departures can be characterized as "upward," or in the direction of more restrictive decisions. In contrast, judges only departed downward from the recommendation, opting for OR release in lieu of SOR, in 6% of cases.

As a final consideration, we examined judges' decisions across cases in the "per court" category, which comprised nearly one third of all cases (31%). Recall, these cases are those that corresponded to the outer perimeter of the matrix, and are composed of those identified as high risk and/or accused of serious charges. We found that the discretionary decisions applied to these cases overwhelmingly relied on money. More specifically, judges assigned a monetary bond in 49% of "per court" cases. In an additional 12% of cases, they assigned SOR with financial constraints (SOR+). In other words, money was required for release for three fifths of defendants who received a "per court" recommendation, and was presented as a potential alternative to supervised release (SOR/alt) for an additional 10% of defendants. Just one in five "per court" defendants were granted "straight" supervised release (21%), and only 8% were released OR.

Importantly, these different release mechanisms correspond to large differences in pretrial detention lengths. Although more than four fifths of defendants granted release on nonmonetary conditions are released within 3 days of booking—including 96% of defendants released OR, 88% of defendants released SOR, and 84% of defendants given the option to choose between SOR and money bail—roughly two in five defendants required to post a financial bond (either straight money bail or SOR plus money bail) remained detained after a 3-day period (see Figure 4). Furthermore, the average pretrial detention length of defendants assigned money bail was three times that of defendants released on nonfinancial terms.

TABLE 4 Multinomial logistic regression relative risk ratios (RRR) for model predicting judicial departures

	Departure from OR recommendation versus match RRR (SE)	Departure from SOR versus match RRR (SE)	Money bail versus match RRR (SE)
Criminal history and current charge characteristics			
Active community supervision	0.294** (0.12)	1.479 [†] (0.23)	1.611** (0.22)
Felony charge	0.012*** (0.00)	3.054*** (0.18)	2.000*** (0.10)
Pending charge(s)	0.680** (0.08)	1.783*** (0.13)	3.412*** (0.21)
Criminal history	1.082 (0.08)	2.393*** (0.17)	1.568*** (0.09)
2+ prior violent convictions	0.149*** (0.06)	1.079 (0.11)	1.619*** (0.14)
Prior nonappearance in court			
2+ prior FTAs	0.291*** (0.05)	1.403*** (0.10)	2.024*** (0.12)
Defendant sociodemographic and background characteristics			
Age	0.996 (0.00)	0.997 (0.00)	1.001 (0.00)
Gender (female)			
Male	1.685*** (0.12)	1.430*** (0.09)	2.057*** (0.11)
Race/ethnicity (non-Latino white)			
Non-Latino Black	0.784** (0.06)	1.370*** (0.08)	1.753*** (0.09)
Latino	0.931 (0.08)	1.328** (0.11)	1.606*** (0.11)
Unemployed at time of arrest	0.654*** (0.05)	1.409*** (0.08)	1.497*** (0.07)
History of substance abuse	0.198*** (0.02)	1.325*** (0.08)	1.157** (0.06)
Constant	0.724** (0.01)	0.102*** (0.01)	0.156*** (0.02)
Likelihood chi-square			5476.96***

[†] $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

4.5 | Judicial discretion and race/ethnicity

These patterns suggest that the courts' reliance on money may override the intended outcomes of risk-based systems, as release rates and detention lengths are significantly impacted by financial forms of release. Beyond limiting the potential for efficiency gains, these examples of judicial overrides also raise the specter of bias. To more fully explore the potential for biases, we examined judicial decision making, including adherence to the recommendations, as well as judicial departures, to determine whether judges' disagreement with the tool's predictions and their imposition of financial constraints was equitable across racial/ethnic groups, net of other important defendant and case characteristics.

In a multinomial logistic regression model (see Table 4), we found that the relative risk ratio for Black relative to White individuals was 0.784 ($p < 0.001$) for OR departure relative to judicial matches, suggesting that judges were slightly less likely to issue OR departures for Black defendants relative to White defendants. However, judges were more likely to depart from SOR recommendations for both Black and Latino individuals, relative to White individuals (relative risk ratios were 1.370 [$p < 0.001$] and 1.328 [$p < 0.01$], respectively). Taken together, a potential explanation for this pattern is that judges may be attempting to adjust for the over-classification of Black

TABLE 5 Odds ratios for the logistic regression models predicting “pretrial failure”

	FTA OR (SE)	New arrest OR (SE)
Judicial decision		
(Decision accords with recommendation)		
Departure from OR recommendation	0.806 (0.14)	1.588** (0.25)
Departure from SOR recommendation	1.218 (0.14)	1.243 (0.15)
Money bail departure	1.326* (0.15)	1.515*** (0.17)
Criminal history and current charge characteristics		
Active community supervision	0.977 (0.22)	2.616*** (0.39)
Felony charge	0.947 (0.08)	1.365*** (0.11)
Pending charge(s)	2.134*** (0.19)	1.718*** (0.15)
Criminal history	0.990 (0.10)	1.334** (0.13)
2+ prior violent convictions	0.749* (0.11)	1.421** (0.17)
Prior nonappearance in court		
2+ prior FTAs	1.718*** (0.17)	0.951 (0.09)
Defendant sociodemographic and background characteristics		
Age	0.994 (0.00)	0.986*** (0.00)
Gender (female)		
Male	1.087 (0.10)	1.201 (0.11)
Race/ethnicity (non-Latino white)		
Non-Latino Black	0.912 (0.08)	0.930 (0.08)
Latino	1.087 (0.12)	0.791 (0.10)
Unemployed at time of arrest	1.160 (0.10)	1.198* (0.10)
History of substance abuse	1.103 (0.11)	1.369*** (0.12)
Supervised pretrial release	0.814 (0.09)	0.713** (0.08)
Constant	0.463*** (0.01)	0.043*** (0.01)
Likelihood chi-square	225.36***	327.85***

* $p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

(and Latino) defendants by sticking to OR recommendations and departing downward from SOR recommendations. However, we also found that Black and Latino defendants were more likely to be assigned money bail than their White counterparts, even after accounting for defendants’ gender, age, and the full range of factors included in the assessment tool (e.g., criminal history, prior FTAs, charge seriousness, etc.). Thus, although judges are slightly more likely to accord with OR recommendations for Black defendants, such recommendations comprise a small share of those received by Black defendants (19%). Much more common scenarios include upward departures from SOR recommendations (i.e., applying monetary conditions), and defaulting to money bail for defendants who fall in the “per court” category.

These findings demonstrate how judicial discretion may result in biased outcomes—even when the tools themselves have been found to produce race-neutral predictions. Yet a remaining question is whether these departures—although seemingly biased—reflect judges’ attempts to correct for prediction errors. In a final set of analyses (see Table 5), we examined whether judicial departures served to ameliorate the risk of pretrial failure. Findings from a set of logistic regression

models indicated that, whether focusing on departures from matrix recommendations (OR and SOR release) or the use of money bail, judicial departures were associated with heightened odds of FTA and arrest for new criminal activity during the pretrial period. In particular, reliance on money was associated with heightened odds of both FTA and new criminal activity. In addition, departures from OR recommendations (to SOR) were associated with heightened odds of new criminal activity. Although the effects for departures for SOR recommendations were also in the direction of heightened pretrial failure risk (both FTA and new criminal activity), they did not reach conventional levels of statistical significance ($p < 0.10$). Nevertheless, the exercise of judicial discretion, in this jurisdiction, is linked to worsened outcomes for defendants (relative to judicial adherence to matrix recommendations), thus potentially also overriding the benefits to levels of pretrial failure achieved by the tool's predictions.

5 | DISCUSSION

Pretrial detention in the United States has contributed to massive increases in the size of our jail population (Menefee, 2018; Stephen, 1984; Zeng & Minton, 2021), and current practices have been shown to contribute to a cascade of negative criminal legal, social, and economic outcomes for defendants (e.g., Dobbie et al., 2018; Heaton et al., 2017; Wakefield & Andersen, 2020). Further, and as has been documented across other legal system phases, these early-stage decisions have disproportionately disadvantaged Black and Latino individuals (e.g., Cadoff et al., 2021; Demuth, 2003; Freiburger et al., 2010; Wooldredge, 2012). A recent wave of reform efforts has signaled the growing support for changes to pretrial policy and practice that increase release rates and address racial and ethnic disparities in detention. Within this movement, there is a recognition of the need to move away from a wealth-based system of pretrial liberty. Although the precise alternative to our current system remains elusive, many researchers, practitioners, and advocates have touted the potential of risk assessment tools to achieve these aims. Yet as we have highlighted here, the widespread adoption of these tools has preceded the necessary evaluative work to determine their effectiveness.

In the current investigation, we critically examined the extent to which risk assessment tools are necessarily linked to observed variability in pretrial practices and outcomes. The findings are of theoretical and practical import, as they underscore that the field's emphasis on tool development and model performance—although fundamental—does not prepare us to answer the very basic question of whether or not PRAIs are an effective means of efficiently and equitably reducing pretrial populations. Our findings suggest the need to confront whether/how judges' exposure to PRAI recommendations influences their decision making. Additionally, recognizing that judges inevitably make their own decisions in light of the actuarial predictions, our findings call into question the impact of judicial discretion on efficiency and fairness. Yet more fundamentally, our results challenge the strategy of pitting resource- and risk-based systems against one another, as neither sets an explicit goal of reductions in pretrial detention.

We began by sharing findings from our local validation. Drawing on data across a roughly 2-year period, we examined the accuracy with which the VPRAI-R predicted pretrial failure in the local context. Our validation findings determined that the PRAI was able to distinguish between cases more often than not. More specifically, a randomly selected defendant who failed received a higher risk classification than a randomly selected defendant who did not roughly three out of five times. As we have indicated, this level of predictive accuracy is consistent with other widely used assessment tools, and thus provides a useful starting point to begin unpacking the potential

impact of PRAI implementation on pretrial practices. Yet, as previously noted, there is a need for a more critical discussion of the metrics used to assess model performance, as the bar for acceptability within the criminal justice realm is astonishingly low relative to other fields that rely on diagnostic tools (see Copp & Casey, 2021). Furthermore, we also noted variability in the tool's accuracy across pretrial outcomes and a greater likelihood of high-risk misclassification among Black and Latino individuals relative to White individuals.¹⁶

One of the first questions that we addressed was whether the adoption of the VPRAI-R resulted in reductions to levels of pretrial incarceration. Examination of trends in the monthly shares of defendants released in less than 3 days before and after the PRAI implementation illustrated that there was a very slight increase in pretrial release achieved during the post-implementation period. However, further examination revealed that this was largely attributable to increased efficiency in processing defendants charged with a felony. In contrast, the share of misdemeanor defendants released in 3 days or less actually declined slightly following the implementation of the PRAI. Thus, although the overall pattern is consistent with the goals of PRAIs, the expectation is that their use will encourage greater risk-based decision making, which we would expect to increase release rates for low-risk defendants. Instead, we observed greater efficiency gains in the pretrial processing of felony defendants, foreshadowing potential problems with the way in which the PRAI is being used to inform decisions.

It is widely touted that tools' risk-based approach inherently helps jurisdictions move away from decisions rooted in defendants' wealth. Yet whether PRAIs have proven an effective means of reducing our overreliance on money has received limited attention. In order to evaluate this, we examined monthly releases before and after the PRAI implementation by release type. The observed patterning of releases demonstrated a slight decrease in the share of defendants released via money bail and a corresponding increase in judges' reliance on pretrial supervision (SOR). These patterns would appear to suggest that judges were increasingly opting for nonfinancial forms of release in the period following the PRAI adoption. However, upon further analysis we found that a substantial minority of SOR decisions were accompanied by a financial component, suggesting that the adoption of a PRAI had little impact on judges' reliance on money. Thus, although PRAIs are often described as an alternative to resource-based systems, these patterns suggest that risk- and resource-based systems may continue to operate in tandem.

In light of our findings that the PRAI neither resulted in notable efficiency gains nor curtailed the county's reliance on money, we were interested in scrutinizing judicial decisions within the PRAI context. We found that judges complied with release recommendations less than half of the time. In the remainder of cases, they typically departed "upward" from the recommendation, either placing defendants on supervised pretrial release (in lieu of OR) or assigning a monetary bond. The release recommendations provided by PRAIs are advisory, and thus courtroom workgroup members are well within their rights to deviate from them. However, the extent and nature of judicial overrides disregards the spirit of these tools, as judges not only favored more restrictive release decisions, but made decisions in ways that largely overlooked the risk-based estimates provided by the tool. This suggests that buy-in from these key decision makers was limited, which immediately diminishes the prospect of meaningfully altering pretrial practices in the PRAI context. Furthermore, judges' heavy reliance on money translated to longer detention lengths for defendants, as the average number of days spent in jail among those assigned money bail was three times greater than that of defendants released on nonfinancial terms. These observed patterns are consistent with recent findings linking money bail to detention length (Martinez et al., 2020), thus reinforcing racial disparities in a range of downstream consequences, including conviction and incarceration.

These findings make clear some of the challenges that money bail poses to risk-based systems. Although many have described these tools as potential replacements to systems in which money bail predominates (Barabas et al., 2019; Stevenson & Mayson, 2017a), decision makers may be less inclined to view risk- and wealth-based systems as discrete modes of operating. Indeed, the literature on path dependence provides a framework for understanding resistance to such abrupt policy change, as local actors may adapt to external changes in ways that maintain current practices (see, e.g., Beckett et al., 2018). Scholars have observed these tendencies in the context of predictive algorithm implementation, noting how actors' efforts to preserve their autonomy may function to *displace* rather than *replace* discretion (Brayne & Chirstin, 2021). This helps us understand the apparent disconnect between the anticipated benefits of PRAIs and their practical implications. Indeed, at a time when reliance on predictive technologies is expanding, our findings expose the extent to which local practices are enduring, even in the context of reform. Should jurisdictions truly desire to reduce their reliance on money, they will need to engage in very explicit discussions on how this will be achieved. This is an important—and largely overlooked—aspect of risk assessment evaluation work, as the use of money bail is likely to override some of the anticipated benefits of PRAIs, as we have demonstrated here. In fact, we argue that the approach of pitting resource- and wealth-based systems against one another may be unproductive, as both systems are capable of maintaining high levels of detention. Instead, what may be needed are more fundamental shifts away from systems built to either assess risk or punish poverty toward systems that start from the basic premise that people should be free.

Much of the recent debate over PRAIs has centered on their potential to exacerbate disparities. Noting the systemic racism that plagues our criminal legal system, for example, some scholars have argued that the quest to develop a tool that draws upon system-generated information to determine “risk” is futile (see, e.g., Eckhouse et al., 2018). There is a lively and ongoing debate about PRAIs and racial bias, including whether existing approaches of assessing racial bias (e.g., predictive parity) are capturing the extent of the problem. However, we were interested in moving beyond these more empirical questions to consider how judicial decisions may further contribute to racial bias. Although others have argued that judicial departures may serve the purpose of correcting for defendant over-classification, thus reducing the number of errors produced, we found that departures were associated with poorer outcomes (particularly for Black and Latino defendants) and increased rates of pretrial failure. That is, judges were more likely to assign money bail to Black and Latino defendants, relative to White defendants. Thus, it appears that judges may view PRAI recommendations as underestimates of risk, which encourages them to depart upward—this despite the fact that this particular PRAI was found to overestimate the risk of failure for Black and Latino defendants assessed as high risk. These findings accord with those of a recent study, which found that judges presented with PRAI recommendations produced decisions that were less fair (Imai et al., 2020). And although it is impossible from our findings to conclude that judicial departures led to increased rates of failure, the pattern of findings did suggest that, relative to judicial decisions that accorded with PRAI recommendations, pretrial departures were associated with greater odds of pretrial failure, including failure to appear and rearrest.

Although this investigation sheds considerable light on PRAI implementation and some of its challenges, it is not without limitations. First, our data are taken from a single jurisdiction, and thus findings may not be broadly generalizable. Second, although we consider trends during the pre- and post-implementation periods, our analyses of individual-level outcomes primarily consider factors associated with variability in judicial decisions and defendant outcomes in the PRAI context, and thus cannot be used to draw inferences about how judges and/or defendants would have behaved in the absence of a PRAI. Third, similar to other validation studies, our

validation findings and our logistic regression models predicting pretrial failure necessarily focused on the subset of defendants who were released at some point during the pretrial process. Although a majority of defendants were released across low-, medium-, and high-risk classifications, the sample of releasees is nevertheless somewhat overly representative of individuals classified as “low risk.” Our analyses include a rich set of legal and extralegal factors; however, it is possible that there are additional unobserved factors, including those that may be linked to both judicial decisions and defendant outcomes, that were not captured in our data. Future studies evaluating PRAI implementation efforts should attempt to attend to some of these limitations by drawing on data from multiple jurisdictions, considering designs that permit direct comparisons of judges’ and individuals’ behaviors with and without PRAIs, and relying on samples that are more broadly representative. In addition, future research should aim to center the experience of pretrial detention within the broader literature on collateral consequences. The recent attention to the pains inflicted by the system on individuals, families, and communities tends to focus somewhat narrowly on efforts to alleviate the harms associated with time spent in prison (Travis et al., 2014). Yet this approach fails to acknowledge that by the time people get to prison, much of the harm may have already been done. We need to focus more on pretrial detention to not only identify best practices, but to better understand the legal and social implications of such practices, as well as the processes through which pretrial detention shapes defendants’ likelihood of more severe punishment, including imprisonment, and contributes to an accumulation of disadvantage across the life course (Kurlychek & Johnson, 2019).

We are currently in the midst of a new phase of criminal justice reform that is focused on confronting an unjust criminal legal system that disproportionately inflicts harms on young Black men (and their broader networks). The death of George Floyd has galvanized a national call for meaningful strategies that directly confront racial bias. Yet there remains much to be learned about the specific policies and practices that will help us move toward eliminating racial bias. As our findings demonstrate, meaningful and effective reform requires more than the adoption of practices that *appear* beneficial based on the results of validation studies and hypothetical research simulations. Indeed, there is a tendency of institutions and system actors to carry on in ways that maintain the status quo, including efforts to circumvent reform (see also Beckett et al., 2018). Thus, there is a real need for research on the practical implications of reform, including implementation impediments and challenges, local contextual considerations, and other barriers. It has been in response to reoccurring justice reform implementation difficulties that a growing number of criminology researchers have embraced what is termed “translational criminology,” the purpose of which is to promote a “dynamic interface” between researchers and criminal justice practitioners (Laub, 2012). A particularly promising aspect of these interface efforts has been the emergence of researcher and practitioner partnerships. Building, sustaining, and maximizing the effectiveness of these partnerships take time and commitment, and, as demonstrated in our current work on pretrial reform, will be incremental. Yet these types of open and incremental exchanges between researchers and practitioners help bridge the all too common disconnect between research and practice. In our view, incremental, evidence-centered partnership exchanges hold important promise in our ongoing efforts to change and improve criminal justice, as such efforts may help encourage system actors to disrupt approaches to decision making that are deeply engrained in favor of novel approaches that reduce our reliance on detention and promote greater equity in legal practices, the decisions of system actors, and the outcomes of justice-involved individuals.

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CONFLICT OF INTEREST STATEMENT

The authors confirm that they have no conflict of interest to declare.

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ENDNOTES

- ¹ A major problem is that the tools do not themselves decide how much risk is too much. Instead, local decision makers are tasked with settling disputes regarding their aversion to risk—often with little guidance or consensus.
- ² More specifically, researchers across multiple disciplines have begun to contribute to a scholarly discourse in which the following questions have been raised: (1) How well do PRAIs predict the future?; (2) What are they actually predicting (e.g., defendant behavior versus system outcomes)?; and (3) What information is being used to produce their predictions? An even larger debate has emerged over the question of whether tools can be race neutral.
- ³ Although we saw some marked declines in the use of incarceration early on in the COVID-19 pandemic, jail incarceration has been slowly creeping back toward prepandemic levels (CUNY Institute for State & Local Governance, 2021).
- ⁴ This is consistent with recent findings from a Federal Reserve report on the economic well-being of U.S. households, which indicated that nearly two in five U.S. adults would not be able to cover a \$400 emergency with cash, savings, or a credit charge that they would pay off at the next statement (Board of the Governors of the Federal Reserve System, 2020).
- ⁵ More recently, there have been a number of successful challenges to the constitutionality of detaining people assigned money bail without considering their ability to pay. These cases draw on the 14th amendment, arguing that money bail violates defendants' equal protection and due process rights (e.g., *O'Donnell v. Harris County, Texas*, 251 F. Supp. 3d 1052 [S.D. Tex. 2017], *aff'd in part, rev'd in part, O'Donnell v. Harris County, Texas*, 882 F. 3d 528 [5th Cir. 2018]; *In re Humphrey*, 228 Cal. Rptr. 3d 513, 545 [Ct. App. 2018]).
- ⁶ Here, fairness is measured according to how individuals with similar potential outcomes are treated. Thus, racially unfair decisions would be ones in which judges' decisions (e.g., release/detain) differed across defendants of different races, despite these defendants receiving similar assessments of "risk," according to an algorithmic tool.
- ⁷ To be sure, each of these studies relied on different samples and methodological approaches, which likely contributed, at least in part, to their divergent findings. In particular, Stevenson focused on statewide changes in judicial decisions and defendant outcomes following a statewide criminal justice reform; Imai and colleagues conducted a randomized controlled trial within a single-county jurisdiction to examine PRAI effects on judicial decision making; and Lowder and colleagues conducted a multisite investigation with multiple comparison conditions to examine the impact of a PRAI on judicial decisions and defendant outcomes.
- ⁸ Preimplementation trends were observed during the 28-month period leading up to the VPRAI-R adoption (May 1, 2015 to August 31, 2017).
- ⁹ This county relies on a bail schedule, and thus some defendants post bond prior to the bail hearing (and risk assessment). Such defendants are not included in the sample, as they neither completed a risk assessment nor appeared before a judge.
- ¹⁰ Defendants' pretrial release status refers to whether they were released at any point during the adjudication of their case, or whether they were detained until their case was resolved.
- ¹¹ Weighting of the individual risk factors was as follows: (1) community supervision = 2; (2) felony charge = 3; (3) pending charge = 2; (4) criminal history = 2; (5) 2+ prior FTA = 1; (6) 2+ prior violent convictions = 1; (7) unemployed = 1; (8) history of drug abuse = 2.

- ¹² The AUC estimates for the models predicting the separate types of pretrial failure were 0.592, 0.638, and 0.624 for pretrial FTA, new arrest, and technical violation, respectively. Although these are largely within the same range, they do indicate that the tool is a slightly better predictor of some types of failure than others.
- ¹³ These characterizations were generated by researchers working in the area of criminal justice risk assessment. However, others have indicated that AUCs less than 0.7 provide poor discrimination (Mandrekar, 2010), suggesting that the threshold used in the field of criminal justice may be somewhat biased in favor of risk assessment tools.
- ¹⁴ Recent research suggests that range restriction, via the detention of a high-risk individuals, may reduce predictive validity estimates (Lowder & Wilson, 2021). Although the share of high-risk defendants detained in the current sample (49%) fell below the threshold of concern identified in this prior work, we nevertheless recognize the potential influence of range restriction on our predictive validity estimates.
- ¹⁵ This includes SOR+ and SOR/alt categories.
- ¹⁶ What was striking in our initial review of the data was that the vast majority of defendants—more than four in five—were successful during the pretrial period, attending all required court hearings, avoiding additional criminal justice involvement, and complying with the conditions of their release. In fact, this high level of compliance persisted across defendants of all risk levels, as fewer than one in three “high risk” defendants (level 5 and 6) failed during the pretrial period. Although one interpretation of these findings is that judges are particularly effective at identifying individuals who are suitable for release, an alternative position is that judges frequently make decisions that are overly risk averse, thus relying unnecessarily on pretrial detention.

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APPENDIX

TABLE A1 Pretrial release matrix

Current charge						
Risk	Nonviolent misdemeanor	DUI	Nonviolent felony	Violent misdemeanor	Violent felony	
1	ROR	ROR	ROR	ROR		Per court
2	ROR	SOR I	SOR I	SOR I		Per court
3	SOR I	SOR I	SOR II	SOR II		Per court
4	SOR II	SOR II	SOR III	SOR III		Per court
5	SOR III	SOR III	SOR IV	Per court		Per court
6	Per court	Per court	Per court	Per court		Per court