Revalidating the Federal Pretrial Risk Assessment Instrument (PTRA): A Research Summary

Thomas H. Cohen[1]
Christopher T. Lowenkamp
William E. Hicks
Probation and Pretrial Services Office
Administrative Office of the U.S. Courts

AFTER A PERSON is arrested and accused of a crime in the federal system, a judicial official must determine whether the accused person (that is, the defendant) will be released back into the community or detained until the case is disposed (American Bar Association, 2007). The decision to release or detain a defendant pretrial represents a crucial component within the criminal justice process (Eskridge, 1983; Goldkamp, 1985). In addition to curtailing a defendant's liberty, the decision to detain a defendant pretrial can potentially affect case outcomes by increasing the likelihood of conviction, the length of an imposed sentence, and the probability of future recidivism (Heaton, Mayson, & Stevenson, 2017; Lowenkamp, VanNostrand, & Holsinger, 2013; Oleson, VanNostrand, Lowenkamp, Cadigan, & Wooldredge, 2014). Given the importance of the pretrial release

decision, the process is increasingly being informed by actuarial risk instruments capable of assessing a defendant's risk of pretrial misconduct involving missed court appearances or threats to public safety (Bechtel, Lowenkamp, & Holsinger, 2011). This has particularly been the case in the federal system, which has adopted the Pretrial Risk Assessment Instrument (hereafter, PTRA) to assess a defendant's likelihood of engaging in pretrial misconduct involving missed court appearances, pretrial revocations, or rearrests for new criminal activity (Cadigan & Lowenkamp, 2011; Cadigan, Johnson, & Lowenkamp, 2012; Lowenkamp & Whetzel, 2009).

The PTRA is an actuarial risk assessment instrument used by federal officers to assess a defendant's likelihood of engaging in several forms of pretrial misconduct, including failing to make court appearances, committing criminal activity that results in a new rearrest, or having a revocation while on pretrial release (Cadigan & Lowenkamp, 2011; Cadigan et al., 2012; Lowenkamp & Whetzel, 2009). Implemented in fiscal year 2010, the PTRA has nearly universal usage rates. Since the PTRA is being extensively used in the federal pretrial system, ongoing and comprehensive research is required to ensure its validity. Although the PTRA was re-validated five years ago on a relatively small sample of released defendants (n = 5,077), with actual officer-completed PTRA assessments (Cadigan et al., 2012), a

revalidation of the PTRA is necessary to assess this instrument's predictive performance on a substantially larger population of federal defendants who received PTRA assessments during the course of their pretrial investigations. In addition, it is necessary to examine whether the PTRA predicts specific forms of pretrial violation outcomes, such as rearrests for any or violent criminal activity, pretrial revocations, or missed court appearances.

This report provides a synopsis of key findings from a longer study examining the PTRA's predictive efficacy, which has been accepted and will be published by *Criminal Justice and Behavior* (see Cohen & Lowenkamp, in press). It sought to revalidate the PTRA on a large national sample of released federal defendants with actual PTRA assessments. The revalidation component primarily assessed the PTRA's overall accuracy in predicting any forms of pretrial violations (e.g., any adverse events) as well as its capacity to predict specific pretrial violations, including new criminal rearrests for any or violent offenses, missed court appearances, and pretrial revocations. The prediction of rearrest activity is especially important because we relied on official rap sheets rather than data entered into the Administrative Office of the U.S. Courts (AO's) case management system by pretrial officers (e.g., the Probation and Pretrial Services Automated Case Management System or PACTS for short), to assess the frequency of rearrest activity among the released

federal pretrial population. Last, this report will briefly address the PTRA's capacity to predict pretrial violations across racial and ethnic groups and for males and females.

Before delving into these issues, a brief overview of risk assessment in the federal pretrial system and the PTRA is provided for background purposes. Afterwards, study methods will be detailed and principal findings presented. The study will conclude by discussing implications for the federal pretrial system and for officers charged with making release/detention recommendations.

Risk Assessment in the Federal Pretrial System

In the federal system, pretrial and probation officers play a major role assisting judicial officials with the pretrial release decision under the auspices of the Pretrial Services Act of 1982 (18 U.S.C. §3152) (AO, 2015; Lowenkamp & Whetzel, 2009). This legislation established pretrial services agencies within each federal judicial district (with the exception of the District of Columbia) and authorized federal pretrial and probation officers to collect, verify, and report on information pertaining to release decisions, make recommendations on the release decision, supervise released defendants, and report instances of noncompliance to the U.S. Attorney and federal courts (Lowenkamp & Whetzel, 2009; VanNostrand & Keebler, 2009). The officer's authority to investigate a defendant's background in the bail decision was further expanded by the Bail Reform Act of 1984 (hereafter, the 1984 Act) (18 U.S.C. §3141 – 3150). This act required federal officers and the courts to consider a defendant's dangerousness or threat to the community safety, in addition to flight risk, when making pretrial release decisions (18 U.S.C. §3141 – 3150) (AO, 2015; Cadigan et al., 2012; Goldkamp, 1985; Lowenkamp & Whetzel, 2009; VanNostrand & Keebler, 2009). Last, the 1984 Act identified several factors federal courts should consider when making pretrial release/detention decisions (AO, 2015; Cadigan et al., 2012; Lowenkamp & Whetzel, 2009; VanNostrand & Keebler, 2009).[2]

The use of an actuarial pretrial risk assessment tool in the federal system was initiated when the Office of the Federal Detention Trustee (OFDT), an agency within the U.S. Department of Justice responsible for administering and controlling the cost of pretrial detention within the federal system with support from the AO, sponsored a study to "identify statistically significant and policy relevant predictors of pretrial risk outcome [and] to identify federal criminal defendants who are most suited for pretrial release without jeopardizing the integrity of the judicial process or the safety of the community …." (VanNostrand & Keebler, 2009: 1). One of the major recommendations of this study was that the federal system develop and implement an actuarial risk tool that could be used to inform pretrial release and detention decisions (Cadigan et al., 2012; VanNostrand & Keebler, 2009). As a result, the federal Probation and Pretrial Services Office (PPSO) within the AO constructed, validated, and ultimately implemented the PTRA.

The Federal Pretrial Risk Assessment (PTRA) Tool

The development and implementation of the PTRA is well documented (see Cadigan & Lowenkamp, 2011; Cadigan et al., 2012; Lowenkamp & Whetzel, 2009). In summary, the PTRA was constructed using the same archival data employed in the OFDT study (Cadigan et al., 2012). Specifically, construction and validation samples comprising about 200,000 federal defendants released pretrial from fiscal years 2001 through 2007 were used to construct a risk instrument capable of predicting a released defendant's risk of failure to appear, rearrests for new criminal activity, or pretrial revocation (Cadigan et al., 2012; Lowenkamp & Whetzel, 2009).

Using regression modeling techniques, 11 items were identified and incorporated into the PTRA risk scoring algorithm (Cadigan et al., 2012; Lowenkamp & Whetzel, 2009). These items include factors measuring a defendant's criminal history, instant conviction offense, age, educational attainment, employment status, residential ownership, substance abuse problems, and citizenship status.[3] Weights for these items were calculated based on the magnitude of the bivariate relationship between the selected factors and the pretrial violation outcomes mentioned above and ranged from zero to three points, depending upon the item being scored. Ultimately, this process resulted in a risk-scoring algorithm that generated raw scores for each defendant ranging from 0 to 15 that were further grouped through visual inspection and confirmation of best fit into the following five risk categories: PTRA one (scores 0 – 4), PTRA two (scores 5 – 6), PTRA three (scores 7 – 8), PTRA four (scores 9 – 10), or PTRA five (scores 11 or above) (Lowenkamp & Whetzel, 2009). Both the initial validation and revalidation studies showed the PTRA successfully differentiating defendants by their risk of garnering pretrial violations involving failure to appear, new criminal rearrests, and pretrial revocations (Cadigan & Lowenkamp, 2011; Lowenkamp & Whetzel, 2009).

While these studies show the PTRA serving as an adequate predictive mechanism, as is the case with any risk assessment, ongoing validation is required, as is investigating the instrument's validity with subpopulations of interest. The last PTRA re-validation occurred five years ago and was done on a small sample of released federal defendants (n = 5,077) with actual officer-completed PTRA assessments (Cadigan et al., 2012). In addition, to date there has been no published research on the PTRA's capacity to predict violent crimes or its predictive validity across race, sex, or ethnic subpopulations. Moreover, prior research efforts relied on officer-imputed rearrest data entered into PACTS rather than on rearrest activity extracted from official rap sheets.

Present Study

In the present study we will evaluate the PTRA's predictive efficacy by primarily exploring its capacity to predict any forms of pretrial violations (e.g., any adverse events) as well as its abilities to predict specific forms of pretrial violations, including rearrests for any or violent criminal activity, missed court appearances, or pretrial revocations among a national population of federal defendants released pretrial. We will also briefly detail whether the PTRA predicts pretrial violation outcomes equally well across racial, ethnic, and sex groups.

Participants

The sample used to assess the PTRA's overall predictive validity was drawn from a larger population of 222,296 defendants who received PTRA assessments as part of their pretrial intake process between November 2009, when the PTRA was deployed in the federal system, and September 2015. This initial population included any defendants with

---

[2] The factors include information relating to a defendant's (1) background; (2) residence; (3) family ties; (4) employment history; (5) substance abuse; and (6) criminal history (AO, 2015); see also 18 U.S.C. §3141 – 3150 for a detailed list of factors courts should consider.

[3] For a detailed description of the PTRA risk factors, see Lowenkamp and Whetzel (2009). Note that many of these items are used by other pretrial risk assessments (see Bechtel et al., 2011; LJAF, 2013).

TABLE 1.
Descriptive statistics of federal defendants in study sample

Variable	n	% or mean
Race		
White, not Hispanic	35,581	42.8%
Black, not Hispanic	21,228	25.6
Hispanic, any race	20,112	24.2
Other race/a	6,170	7.4
Gender		
Male	61,200	71.7%
Female	24,161	28.3
Citizenship		
U.S. citizen	73,601	86.8%
Naturalized U.S. citizen	4,802	5.7
Citizen of another country	6,406	7.6
PTRA risk categories		
One	28,033	32.8%
Two	24,017	28.1
Three	20,992	24.6
Four	9,836	11.5
Five	2,491	2.9
Average age (in years)	85,356	37.8
Average PTRA raw score	85,369	5.8
Time on pretrial release (in months)	85,335	11.3
Average number of defendants	85,369	

Note: Includes federal defendants released pretrial with PTRA assessments occurring between fiscal years 2010 - 2015.
a/Other race includes Asians, Pacific Islanders, and Native Americans.

PTRA assessments regardless of whether they were released or detained pretrial. Defendants were deemed eligible for this study if they (1) were released pretrial so that we could track their pretrial violation outcomes (n lost = 111,400 defendants); (2) no longer had a case in an opened status, ensuring a complete measure of defendant violation activity while in the release phase (n lost = 24,376 defendants); and (3) had an actual PTRA assessment date for the purpose of tracking time while on pretrial release (n lost = 1,151 defendants). Using these criteria yielded a pool of 85,369 defendants that could be used to evaluate the PTRA's predictive validity.

Table 1 provides a descriptive overview of defendants in the PTRA validation sample. About two-fifths of the study population (43 percent) comprised non-Hispanic whites, while blacks (26 percent) and Hispanics of any race (24 percent) accounted for similar portions of defendants. Males accounted for 72 percent of the study population, and the average defendant age was about 38 years. The majority of defendants in the study population (93 percent) were either U.S. born or naturalized citizens; a fact that should not be too surprising given that nearly all non-citizens are detained pretrial. Around 61 percent of defendants were classified into the lower PTRA risk categories (e.g., PTRA ones and twos), 25 percent were deemed moderate risk (PTRA threes), and the remaining 15 percent were placed into the higher PTRA risk groups (e.g., PTRA fours or fives). Furthermore, the average PTRA score was 5.8, with a range of zero to 15 points.

Measures of Risk

The PTRA's history, development, and risk-scoring scales have been discussed in other sections of this paper and detailed in prior research (see Cadigan & Lowenkamp, 2011; Cadigan et al., 2012; Lowenkamp & Whetzel, 2009). To briefly reiterate, the scores generated from the PTRA range from 0 to 15 and are used to place defendants into five different risk categories. For purposes of this study, we assess how the total PTRA scores and five categories perform in terms of risk prediction. We do not gauge this instrument's predictive capacities at the individual item or domain level.

Measuring Pretrial Violations

For the section of this study focused on validating the PTRA's overall predictive efficacy, we examine whether this instrument effectively predicts rearrests for new offenses, rearrests for violent offenses, pretrial revocations, or failure to appears (e.g., FTAs). Pretrial revocations involve the removal of a defendant on pretrial release because of rearrests for new criminal activity or technical violations of release conditions, while FTAs imply the failure to show up to court for a designated hearing. Both violation outcomes were extracted from PPSO's internal case management database (hereafter, PACTS). Conversely, rearrests for new criminal activity were obtained from the National Crime Information Center (NCIC) and Access to Law Enforcement System (ATLAS). ATLAS is a software program used by the AO that provides an interface for performing criminal record checks through a systematic search of official state and federal rap sheets (Baber 2010). The ability to access and use official

rap sheets represents a break from previous PTRA validation studies (see Cadigan & Lowenkamp, 2011; Cadigan et al., 2012; Lowenkamp & Whetzel, 2009) where the pretrial rearrest data were entered into the federal case management system by pretrial officers.

Pretrial rearrests are defined to include arrests for either a felony or misdemeanor offenses (excluding arrests for technical violations) between the time of pretrial release and case closure. In addition to measuring any rearrests, we also identified rearrests for violent offenses committed during the pretrial release phase. For violent rearrests, we used the definitions from the NCIC, which include homicide and related offenses, kidnapping, rape and sexual assault, robbery, and assault (Lowenkamp, Holsinger, & Cohen, 2015). One issue with using rap sheet data involved our inability to distinguish events involving self-surrenders to federal officials from actual rearrests by federal officials resulting from new criminal activity. This is a problem in the federal pretrial arena, where defendants on pretrial release will often self-surrender to federal officials after case adjudication and sentence imposition. The inability to separate out these surrenders from rearrests meant that we could only count those pretrial rearrests involving state or local law enforcement entities.

In addition to modeling individual pretrial violation events, we investigated the PTRA's capacity to predict a combination of various pretrial outcomes, including outcomes involving any forms of adverse events: pretrial revocations, rearrests, or FTAs (i.e., any adverse event), or a combined outcome involving new pretrial rearrests or FTAs (i.e., new rearrest/FTA). We modeled these aggregated forms of violation activity to construct an instrument capable of predicting any form of pretrial misconduct as well as outcomes that fell outside technical violations of pretrial special conditions (Cadigan & Lowenkamp, 2011; Cadigan et al., 2012; Lowenkamp & Whetzel, 2009).

Table 2 presents information on the percentage of released federal defendants with pretrial violations between their release and case closed dates. Overall, about 14 percent of released defendants committed some form of pretrial violation—meaning they were revoked, rearrested, or had an FTA—during their time while on pretrial release. About 6 percent of released defendants garnered a new criminal arrest for any offense and 1 percent were arrested for violent offenses. Approximately 2 percent of released federal

defendants missed their court appearances, and a combined 8 percent of released defendants were either rearrested for a new offense or failed to appear.

Analytical Plan

In order to test for the PTRA's overall predictive capacities, we calculated descriptive statistics and measures of predictive validity (e.g., AUC-ROC scores). In the risk assessment literature, the Area Under the Receiver Operating Characteristic Curve (AUC-ROC) score measures the probability that a score drawn at random from one sample or population (e.g., a recidivist's score) will be higher than that drawn at random from a second sample or population (e.g., a non-recidivist score). The AUC can range from .0 to 1.0, with .5 representing the value associated with chance prediction. Minimum AUC-ROC scores of .56, .64, and .71 correspond to "small," "medium," and "large" effects, respectively (Rice & Harris, 2005). The AUC-ROC provides an accepted gauge of an instrument's predictive accuracy, in part because these scores, unlike correlations, are not influenced by low base rates (Babchishin & Helmus, 2016). This is especially important for the current study, where the base rates for certain pretrial violation outcomes such as violent rearrests or FTAs are particularly low.

Results

We examine the PTRA's overall predictive efficacy for all released defendants in the sample (n = 85,369). Figure 1 presents information on the percentage of released defendants committing pretrial violations involving any adverse events, pretrial revocations, a combined new criminal rearrest, or FTA, or new criminal rearrests for any offenses across the five PTRA risk categories. Results from Figure 1 show that the PTRA effectively predicts pretrial violations irrespective of whether the outcome of interest involves revocation from pretrial release, rearrest for any felony or misdemeanor offenses, or a combination of these outcomes. For example, the percentage of defendants with any adverse events—meaning they had a revocation, new criminal rearrest, or FTA—while on pretrial release increased in the following incremental fashion by PTRA risk category: 5 percent (PTRA ones), 11 percent (PTRA twos), 20 percent (PTRA threes), 29 percent (PTRA fours), and 36 percent (PTRA fives). These results were in the anticipated direction of higher failure rates for each increase in risk classification.

Similar patterns were revealed for the PTRA's capacities to predict specific forms of pretrial violations, including rearrests for any offenses or pretrial revocations. For instance, defendants rearrested for any offenses while on pretrial release amounted to 3 percent of PTRA ones, 5 percent of PTRA twos, 9 percent of PTRA threes, 13 percent of PTRA fours, and 17 percent of PTRA fives. The percentage of defendants with pretrial revocations or with a combined new criminal rearrest/FTA manifested similar patterns of increases by PTRA risk categorization.

Figure 2 presents information by PTRA risk category on the percentage of released defendants rearrested for violent offenses or who failed to appear. These violent rearrests and FTAs are presented separately because their base rates are relatively low. Though only 1 percent of defendants were rearrested for violent offenses while on pretrial release, the violent arrest rates climbed incrementally by risk category: Starting at 0.3 percent for PTRA ones, the violent rearrest rates increased to 0.7 percent for PTRA twos, 1.3 percent for PTRA threes, 2.1 percent for PTRA fours, and then 2.9 percent for PTRA fives. The percentage of defendants with FTAs also had similar patterns of increasing failure rates by PTRA risk categorization.

In addition to examining failure rates by risk category, an overview of the AUC-ROC scores in figures 1 and 2 shows them ranging from .67 to .73 for the FTA (.67), any rearrests (.68), violent rearrests (.69), combined rearrest/FTA (.68), any adverse events (.71), or pretrial revocations (.73) outcomes. These scores mean that the PTRA provides "good" to "excellent" predictive capacities for these specific types of pretrial violations (Desmarais & Singh, 2013).

The relationship between each raw PTRA score—rather than risk categories—and pretrial violations encompassing any adverse events, rearrests for felony or misdemeanor
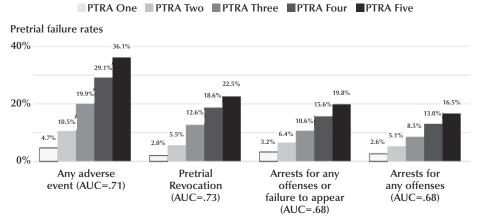
TABLE 2.
Percent of released federal defendants with pretrial violations, by violation type

Violation types	Percent of released defendants with pretrial violations
Any adverse events	13.8%
Pretrial revocation	8.1
New arrest or FTA	7.8
Arrests any offense	6.4
Arrests violent offenses	1.0
Failure to appear	1.7
Number of defendants	85,369

Note: Any adverse event includes pretrial violations involving new criminal arrests, failure to make court appearances, or pretrial revocations.
Specific failure events (e.g., new criminal arrest, pretrial revocation, etc.), will not sum to any adverse event total as defendants can experience multiple violation types simultaneously.

FIGURE 1
Pretrial Risk Assessment (PTRA) failure rates involving any adverse events, pretrial revocations, new criminal arrests, or combination of new criminal arrests/failure to appear, by risk level

Note: PTRA = Pretrial risk assessment instrument risk classification. AUC = Area under the receiver operating characteristic curve. Any adverse event includes pretrial violations involving new criminal arrests, failure to make court appearances, or pretrial revocations. Specific failure events (e.g., new criminal arrest, pretrial revocation, etc.), will not sum to any adverse event total as defendants can experience multiple violation types simultaneously.
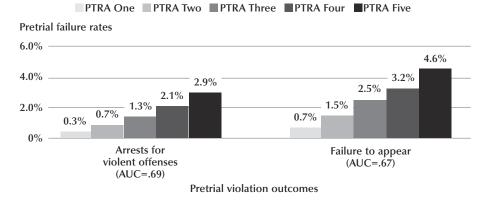
offenses, pretrial revocations, or a combined rearrest/FTA outcome are provided in Figure 3.[4] In this figure, the rates of pretrial failure

---

[4] The FTA and rearrest rates for violent offenses are not shown in Figure 3 because of the very low base rates for these outcomes. See Figure 4 for an examination of the FTA or violent rearrest rate by raw PTRA scores.

involving these specific types of violations are shown to increase with each one-point increase in the PTRA scores. This pattern is particularly evident for pretrial outcomes involving any form of adverse events or rearrests/FTAs. While the percentage of defendants rearrested for new offenses increases gradually by each

point score, it briefly flattens out between PTRA scores 11 and 12 before increasing again. For pretrial revocations, the pattern is one of increasing revocation rates until the PTRA score of 12 is reached; afterwards, the revocation rates declined slightly from 24 percent to 22 percent. It should be noted that defendants with PTRA scores of 13 or above were recoded into PTRA 13s, as there were relatively few defendants with these very high PTRA scores (n= 19) to produce statistically reliable estimates.

Given the low base rates for FTAs and rearrests for violent offenses, the relationship between these pretrial outcomes and the individual PTRA scores is shown in Figure 4. In a pattern mirroring the more common types of pretrial violations, the percentage of defendants who failed to appear or were rearrested for violent criminal behavior for the most part increases incrementally with each one-point increase in the PTRA score. There are some minor exceptions to these patterns: For instance, the FTA rate decreases slightly for defendants with PTRA scores of 0 or 1 before increasing again; moreover, the violent rearrest rates are essentially the same for defendants with PTRA scores of 1/2 and 5/6. Despite these exceptions, the general results even for these low base-rate events is one of gradual increases in the violation rates coinciding with increasing PTRA scores.

Another way of illustrating the PTRA's predictive capacities is to examine the odds of success, rather than the failure rates, for each of this instrument's risk categories. Table 3 presents information on the odds of success across the PTRA risk classification groups. In this table, only selected violation outcomes (i.e., any adverse events, combination of new criminal arrests or FTA, and new criminal arrests) are shown. The odds of success are interpreted as the odds of success occurring to the odds of success not occurring. Although the odds of success during pretrial release decline when moving from one risk category to the next, even for the highest risk category (e.g., PTRA fives), the odds of a defendant successfully completing his or her release term are either 2 to 1, 4 to 1, or 5 to 1, depending upon the violation outcome being examined. For the lowest risk defendants (PTRA ones), the odds of success range from 20 to 1 when analyzing any adverse events to 37 to 1 when focusing solely on arrests for any offenses. Even among PTRA threes, the odds of success range from 4 to 1 for any adverse event outcome to 11 to 1 for the new criminal

FIGURE 2
Pretrial Risk Assessment (PTRA) failure rates involving arrests for violent offenses or failure to appear (FTA), by risk level
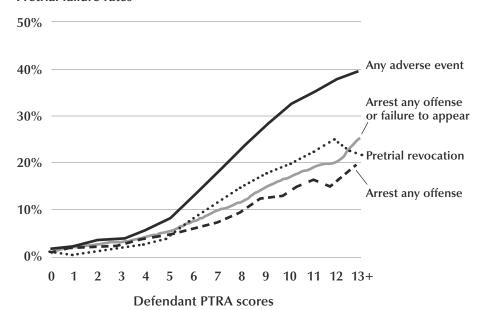

Note: PTRA = Pretrial risk assessment instrument risk classification. AUC = Area under the receiver operating characteristic curve.

FIGURE 3
Percentage of federal defendants with pretrial violations involving any adverse events, pretrial revocations, new criminal arrests, or combination of new criminal arrest or failure to appear, by individual Pretrial Risk Assessment (PTRA) scores

Note: Defendants with PTRA scores above 13 were recoded into a score of 13 as there were not enough released defendants with PTRA scores above 13 (N= 19) to produce statistically reliable estimates.
PTRA = Pretrial risk assessment instrument individual score. Any adverse event includes pretrial violations involving new criminal arrests, failure to make court appearances, or pretrial revocations. Specific failure events (e.g., new criminal arrest, pretrial revocation, etc.) will not sum to any adverse event total as defendants can experience multiple violation types simultaneously.

arrest outcome.

In addition to illustrating the PTRA's general predictive capacities, we briefly summarize the PTRA's capacity to predict pretrial violations across several demographic categories.[5] Specifically, we find that the PTRA can successfully predict pretrial violations irrespective of a defendant's race, ethnicity, or sex. This finding is demonstrated by the fact that as the PTRA risk scores increase, so too does the likelihood of pretrial rearrest, and this pattern holds for whites, blacks, Hispanics, males, and females. For example, an analysis assessing the relationship between new criminal rearrests and the PTRA across matched samples of non-Hispanic white and black defendants indicates that the PTRA operates similarly for these two groups of defendants. In other words, there were similar patterns of incremental increases in the criminal rearrest rates by PTRA risk category for both non-Hispanic white and black defendants. Comparable patterns were manifested when examining the pretrial rearrest rates for non-Hispanic whites and Hispanics and males and females across the PTRA risk categories.

Conclusion and Implications

The current study sought to examine the PTRA's capacity to predict pretrial violations among federal defendants as well as to investigate the instrument for predictive biases across defendant demographic characteristics. Findings from this research show that the PTRA performs well in predicting violations in general, including any adverse pretrial events and a combined new criminal rearrest or FTA outcome. Moreover, the current study demonstrates that the PTRA can adequately predict specific types of pretrial violations, including rearrests for any or violent offenses, FTAs, or pretrial revocations.

The importance of this risk assessment's capacity to predict new criminal rearrests should not be understated. When the PTRA was initially developed, it relied on rearrest data entered by federal officers into the AO's probation and pretrial services case management system (PACTS); rearrest data generated from official rap sheets were not used to measure pretrial recidivism activity. Unlike previous PTRA validation studies, this research used official rap sheets and,

even with changes on how rearrest activity was measured and tracked, it found that the instrument accurately predicted rearrests for new criminal behavior. Moreover, the instrument performed well in predicting violence, which had not previously been examined in the PTRA validation research.

It is remarkable and worth noting that the one score generated by the PTRA can predict these different types of pretrial outcomes. Recent developments in pretrial risk assessment have shifted towards the development of specific scales that maximize the prediction of different outcomes such as new criminal arrests or FTA (LJAF, 2016). However, it might be that the simplicity of a single score, the
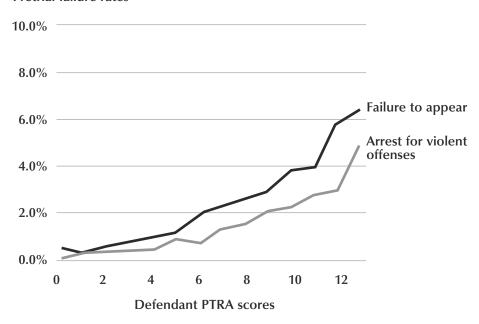
relative accuracy in predicting various outcomes with a single score, and the limitations of data available for scale construction and administration make single score assessments a continued viable option. In addition to general prediction, this research demonstrates that the PTRA can predict violations irrespective of defendant's race, ethnicity, and sex. These findings are supportive of a growing literature showing that risk instruments like the PTRA can be used to assess recidivism risk and inform criminal justice decisions without exacerbating biases in the criminal justice system (Skeem & Lowenkamp, 2016; Skeem, Monahan, & Lowenkamp, 2016).

Over the past several years, the

FIGURE 4

Percentage of federal defendants with pretrial violations involving arrests for violent offenses or failure to appear, by individual Pretrial Risk Assessment (PTRA) scores

Pretrial failure rates

Note: Defendants with PTRA scores above 13 were recoded into a score of 13 as there were not enough released defendants with PTRA scores above 13 (N= 19) to produce statistically reliable estimates. PTRA = Pretrial risk assessment instrument individual score.

TABLE 3.

Odds of pretrial success for selected violation types by Pretrial Risk Assessment (PTRA) categories

PTRA risk categories	Number of defendants	Any adverse event	Arrests for any offenses or failure to appear	Arrests for any offenses
PTRA One	28,033	20:1	30:1	37:1
PTRA Two	24,017	9:1	15:1	18:1
PTRA Three	20,992	4:1	8:1	11:1
PTRA Four	9,836	2:1	5:1	7:1
PTRA Five	2,491	2:1	4:1	5:1

Note: Any adverse event includes pretrial violations involving new criminal arrests, failure to make court appearances, or pretrial revocations.

---

[5] For a more in-depth discussion of the PTRA's capacity to predict pretrial violations outcomes between non-Hispanic whites and blacks, non-Hispanic whites and Hispanics, and males and females, see Cohen and Lowenkamp (in press).

federal pretrial system has experienced steady increases in overall detention rate. The potential influence officers can have on lowering the pretrial detention rate while producing positive outcomes should not be underestimated. Under 18 USC §1354, federal pretrial officers are required to collect, verify, and report to judicial officials on information pertaining to a defendant's flight risk and potential danger to the community and include in their reports recommendations for release or detention, and the special conditions associated with release recommendations. This report clearly shows that the PTRA should be one of the key tools officers rely on when assessing risk and making recommendations on whether a defendant should be released or detained pretrial.

When the PTRA was originally introduced, there was some hesitancy among officers to accept the tool as part of the process of making informed released/detention decisions. As late as 2014, only half of PTRAs were completed prior to the initial judicial decision to release or detain a defendant. Beginning in 2014, the AO initiated a program to reduce unnecessary detention by increasing its efforts to provide education to its stakeholders regarding the appropriate use and interpretation of the PTRA. Part of this outreach involved receiving feedback from judges, officers, and other stakeholders about the PTRA's purposes and capacities. Through these efforts, more officers are now using the PTRA prior to the initial release decision; at present, about 75 percent of PTRAs are being completed before the judicial decision on pretrial release.

This revalidation study is part of the AO's continued efforts to reduce unnecessary detention by providing updated data on the PTRA's capacity to predict pretrial success and/or failures. These findings support the contention that officers can and should use the PTRA to gauge a defendant's likelihood of committing pretrial recidivism and hence apply this instrument when making release recommendations. In fact, the results of this study should empower officers to confidently rely upon the tool and use it in conjunction with a thorough pretrial investigation and their own judgment to develop informed decisions.

When Congress enacted §3142(c), it directed that federal judicial officials make pretrial release decisions in a manner that "reasonably assures" that released defendants make all future court appearances and not threaten community safety. While "reasonable assurance" can be a somewhat elastic concept, this research makes clear that the PTRA can be used to empirically assess the odds of pretrial failure and assist judicial officials in making release decisions based on evidence and data. The finding that defendants on the lower or middle end of the PTRA risk scale have a 20 to 1, 9 to 1, or even 4 to 1 probability of pretrial success supports the position that judicial officials and pretrial services officers should weigh these odds against the decision to incarcerate persons charged with but not convicted of a crime (Lowenkamp & Whetzel, 2009). Ultimately, we believe that the PTRA can be used as a mechanism to help court officials better understand these odds of pretrial success and facilitate scientifically based release/detention decisions and pretrial supervision strategies.

References

Administrative Office of the U.S. Courts (AO) (2015). *Detention Reduction Outreach Program (DROP): Risk assessment as the foundation*. Washington, D.C.: Administrative Office of the U.S. Courts.

American Bar Association. (2007). *ABA standards for criminal justice third edition: Pretrial release*. Washington, D.C.: American Bar Association.

Babchishin, K. M., & Helmus, M. L. (2016). The influence of base rates on correlations: An evaluation of proposed alternative effect sizes with real-world data. *Behavior Research Methods, 48*, 1021-1031.

Baber, L. (2010). Results-based framework for post-conviction supervision recidivism analysis. *Federal Probation, 74(3)*, 5-10.

Bechtel, K., Lowenkamp, C. T., & Holsinger, A. (2011). Identifying pretrial failure: A meta-analysis. *Federal Probation, 75(2)*, 78-87.

Cadigan, T. P., & Lowenkamp, C. T. (2011). Implementing risk assessment in the federal pretrial system. *Federal Probation, 75(2)*, 30-34.

Cadigan, T. P., Johnson, J. L., & Lowenkamp, C. T. (2012). The re-validation of the federal pretrial services risk assessment (PTRA). *Federal Probation, 76(2)*, 3-9.

Cohen, T. H., & Lowenkamp, C. T. (in press). Revalidation of the federal Pretrial Risk Assessment Instrument (PTRA): Testing the PTRA for predictive biases. Manuscript accepted by *Criminal Justice and Behavior*.

Desmarais, S.L., & Singh, J. (2013). *Risk assessment instruments validated and implemented in correctional settings in the United States*. New York, NY: Council of State Governments Justice Center.

Eskridge, C. W. (1983). *Pretrial release programming: Issues and trends*. New York, NY: Clark Boardman Company.

Goldkamp, J. S. (1985). Danger and detention: A second generation of bail reform. *Journal of Criminal Law and Criminology, 76(1)*, 1-74.

Heaton, P., Mayson, S. G., & Stevenson, M. (2017). The downstream consequences of misdemeanor pretrial detention. *Stanford Law Review, 69(3)*, 711-794.

LJAF. (2013). *Developing a national model for pretrial risk assessment*. Houston, TX: Laura and John Arnold Foundation.

LJAF. (2016). *Public safety assessment: Risk factors and formula*. Houston, TX: Laura and John Arnold Foundation.

Lowenkamp, C. T., & Whetzel, J. (2009). The development of an actuarial risk assessment instrument for U.S. pretrial services. *Federal Probation, 73(2)*, 33-36.

Lowenkamp, C. T., VanNostrand, M., & Holsinger, A. (2013). *Investigating the impact of pretrial detention on sentencing outcomes*. Houston, TX: Laura and John Arnold Foundation.

Lowenkamp, C. T., Holsinger, A., & Cohen, T. H. (2015). PCRA revisited: Testing the validity of the federal Post Conviction Risk Assessment (PCRA). *Psychological Services,12*, 149-57.

Oleson, J. C., VanNostrand, M., Lowenkamp, C. T., Cadigan, T. P., & Wooldredge, J. (2014). Pretrial detention choices and federal sentencing. *Federal Probation, 78(1)*, 12-18.

Rice, M., and Harris, G. (2005). Comparing effect sizes in follow-up studies: ROC Area, Cohen's d, and r. *Law and Human Behavior, 29*, 615–20.

Skeem, J., & Lowenkamp, C. T. (2016). Risk, race, and recidivism: Predictive bias and disparate impact. *Criminology, 54(4)*, 680-712.

Skeem, J., Monahan, J., & Lowenkamp, C. T. (2016). Gender, risk assessment, and sanctioning: The cost of treating women like men. *Law and Human Behavior, 40(5)*, 580-593.

VanNostrand, M., & Keebler, G. (2009). Pretrial risk assessment in the federal court. *Federal Probation, 73(2)*, 3-29.

Federal Statutes

Bail Reform Act of 1984, 18 U.S.C. §§ 3141-3150

Functions and Powers Relating to Pretrial Services, 18 USC §§ 1354

Pretrial Services Act of 1982, 18 U.S.C. §§ 3152.