Pretrial Release Risk Study, Validation, & Scoring: Final Report

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Executive Summary

Background

The purpose of a pretrial risk assessment is to predict the likelihood of not showing up for court and/or committing a new offense during the pretrial period. The development of pretrial risk tools has come a long way and recently there has been a growing national movement to improve pretrial release supervision and risk assessments (Mamalian, 2011). Nonetheless, Mamalian notes that a 2009 survey of pretrial programs by the Pretrial Justice Institute (PJI) found that only 24% of programs rely solely on objective criteria for release decisions, while under half of those surveyed (48%) had validated their instruments, and merely one-third were using a tool developed specifically for their jurisdiction. One reason for the lack of validated pretrial risk instruments may be the difficulty predicting risk, which includes data quality issues, the relatively low occurrence of pretrial failure, and the short time frame of pretrial release, as well as the inability to accurately control for non-releases and suppression effects (e.g., influence of supervision or release conditions non-randomly assigned; Mamalian, 2011). In a meta-analysis of existing pretrial risk instruments, static factors (e.g., prior criminal history) rather than dynamic factors (e.g., employment or family relations) were better predictors of pretrial failure, although few factors were strong predictors of pretrial failure (Bechtel et al., 2011). Despite these challenges, work continues on improving pretrial release assessments, with research and experts recommending locally validated, objective instruments (Bechtel et al., 2011; Mamalian, 2011). As such, the current study was undertaken to examine the relationship between pretrial failure and a variety of self-reported and official factors for a sample of defendants released from the Salt Lake County jail.

Pretrial Failure and Proposed Release Instrument

In this study's random sample of pretrial releases (n=1,066), average time from jail release to case closure was over four months (Md = 125 days), with 46% of all released defendants (regardless of release status, e.g., own recognizance, bail, or supervision) failing to appear (FTA) for at least one of their scheduled hearings. Fifteen percent (15%) had a new charge during that period, with most having either a 2nd Degree Felony (28%) or Class B Misdemeanor (23%). The most common offense types were drug (42%) and property (41%). New charge bookings in the Salt Lake County jail, rather than new BCI arrests, were used as the outcome measure of pretrial recidivism. This decision was made due to the discovery that arrests for outstanding warrants are recorded similarly in the BCI database (and rap sheets) as new criminal conduct. As such, it would be too difficult for researchers (or pretrial jail screeners) to differentiate new crime commission from arrests for non-compliance.

Multiple factors from the pretrial pilot assessment (28 items) and official criminal justice records (Salt Lake County Adult Detention Center and statewide criminal history (BCI)) were examined in relation to pretrial failure in a randomly selected development sample (n=527). The strongest predictors, along with some theoretically-driven factors, were loaded into Classification and Regression Tree (CART) decision tree analyses predicting FTA (resulting in 5 significant variables) and recidivism (resulting in 4 significant variables, two overlapping with FTA). The results of these analyses were two pretrial risk scores: one for FTA and one for recidivism, each ranging from one to seven, with seven indicating highest risk of failure. Both risk scores had acceptable discriminant validity on both the developmental and validation samples and performed better than chance (based on AUC-ROC analyses).

Pretrial failure trends were examined for sub-groups by gender, minority status, and release type (e.g., no conditions, financial conditions, supervision). Risk scores generally demonstrated the expected relationship with pretrial failure across these sub-groups. Based on these analyses, the following is recommended as the Pretrial Release Instrument (PRI), although additional (non-scored) items may be added for purposes of assessing needs and providing services or conditions of release (e.g., employment, mental health). It should be noted that longer time to case closure was associated with increased pretrial failure, above and beyond individual risk score. In addition, those who had both District and Justice court cases at their release were more likely to recidivate during pretrial release (again, increased risk above and beyond the recidivism risk score).

Proposed Pretrial Release Instrument (PRI)

Source	**Item**
BCI	Total Number (#) of Prior Arrests in BCI Rap Sheet (leave blank if no rap sheet)
OMS	Has a New Property Charge Booking in Last 2 Years (Y = 1, N = 0)
OMS	Current Age (enter whole number)
OMS	Current Outstanding Warrants (WA, BW, SU; enter whole number, count by offense rows at this booking (not court cases))
OMS	Has Obstructing Law Enforcement New Charge at this booking (Y = 1, N = 0)
Offender Self-Report	Age at 1st Conviction (include juvenile; enter whole number)
Offender Self-Report	Do you believe you have a Substance Abuse problem? (Y = 1, N = 0)

A small non-released sample was also examined and it was determined that a substantial proportion of them scored low to moderate on the FTA risk score (53%), while 47% scored low to moderate on the recidivism risk score. As such, use of the proposed PRI may lead to more individuals qualifying for pretrial release. Additional validation of this proposed instrument should be conducted in the future, especially if it leads to modifications in the type or number of individuals released pretrial. The Pretrial Justice Institute also recommends that risk assessments not only be piloted and validated for the specific jurisdiction using them, but that they are also revalidated on a regular basis to ensure that they continue to retain their predictive validity over time (Clark, n.d.).

Background and Introduction

Pretrial Background

The history and purposes of pretrial release and supervision have been summarized many times in the literature. Two studies (Clarke, 1988; VanNostrand, 2007), in particular, provide comprehensive overviews of the main issues. There are six legal foundations to pretrial release/supervision, of which the sixth is the most important to the development and operation of pretrial supervision:

1. Presumption of innocence
2. Right to counsel
3. Right against self-incrimination
4. Right to due process of law
5. Right to equal protection under the law
6. Right to bail that is not excessive

The Bail Reform Act of 1966 further defined "bail that is not excessive" by outlining the common pretrial release conditions used today: 1) release on recognizance (ROR), defendant released pretrial without the constraint of bail on the promise that he/she will return for future court hearings; 2) conditional non-monetary pretrial release, including supervision and conditions imposed to reduce the risk of flight (the most common impression of pretrial supervision); and 3) monetary bail, which should only be imposed by the court if non-financial conditions are not sufficient enough to assure court appearance. In the Bail Reform Act of 1984, the limited use of preventive detention was further specified to address the concern of potential danger to the community. Furthermore, U.S. criminal code also allows for additional release conditions to be imposed if they are deemed likely to reduce risk of failure to appear (FTA) in court or pretrial recidivism. These conditions can include maintaining employment, participating in educational programs or psychiatric treatment, restricting personal associations or contact with alleged victims or witnesses, abstaining from alcohol/drug use or possessing a firearm, and reporting on a regular basis to a law enforcement agency.

The importance of offering pretrial release with the least restrictive barriers has also been noted in several studies that have demonstrated worse outcomes (more likely to be convicted, or harsher punishments if convicted) for defendants who remain detained pretrial (history of studies cited in Clarke, 1988; VanNostrand, 2007; Williams, 2003). In one such study, Williams (2003) used a logistic regression to control for several legal (e.g., degree of charge, number of current charges, conviction history) and extra-legal (e.g., demographics, having a private attorney) variables and still found that being detained pretrial was the strongest predictor of receiving incarceration as a sentence. In fact, after controlling for all of those other factors, being detained pretrial was associated with over six times greater likelihood of receiving incarceration at sentencing. Being detained pretrial has also been shown to be significantly related to the length of incarceration imposed (after controlling for other significant factors; Williams 2003).

Pretrial Release Decisions

Pretrial release and supervision agencies play a key role in the release decision-making process, acting as the "exchange service" between defendants and the criminal justice system (Worzella & Sayner, 1988). Nonetheless, pretrial supervision agencies face challenging and competing goals,

such as increasing opportunities for release to protect individual's personal freedom and reduce jail populations, while protecting public safety and lowering risk of pretrial failure (Worzella & Sayner, 1988; Lowenkamp, Lemke, & Latessa, 2008). Risk of pretrial failure is generally defined as the likelihood that an offender will fail to appear in court (FTA) and/or commit a new offense during the pretrial period. Typically some combination of current legal factors (e.g., type and degree of offense) and offender risk factors (criminal history, substance abuse, ties to community) are used by the pretrial agencies to calculate risk and determine release criteria.

Some research has been conducted to identify factors that are related to the likelihood of being released pretrial and many studies have found that factors used to make release decisions are not always the best predictors of pretrial success. For instance, Maxwell (1999) found the following factors to be significantly related to an increased likelihood of release on recognizance (ROR) instead of on bail: women, person and property offenders (vs. drug and weapons, who had the least likelihood of ROR), and those with no prior convictions or failures to appear (FTAs). However, females and property offenders were more likely to FTA, suggesting that they should have been released on more restrictive criteria (i.e., bail).

Petee (1994) also examined factors related to release on recognizance (ROR) and found that negative demeanor during the pretrial interview and minority status reduced the likelihood of a recommendation to ROR. According to Baradaran and McIntyre (2012), the primary factors that judges consider when deciding whether or not to release a defendant are: 1) the current offense, 2) the defendant's prior record, and 3) the defendant's current circumstances and character. Although a common consideration, extralegal factors such as the defendant's current circumstances, character, or demeanor introduce a large degree of subjectivity into the decision process that could easily lead to discriminatory release practices. These studies (Baradaran & McIntyre, 2012; Petee, 1994) demonstrate the significant influence that extralegal factors can play in release decisions and highlight the value of standardized pretrial risk instruments that can remove much of this subjectivity.

Pretrial Risk Assessments

Pretrial risk assessments are comprised of a number of factors that have been found to predict a person's risk of not showing up for court and/or committing a new offense during the pretrial period. The development of pretrial risk tools has come a long way, with several attempts made at creating and validating risk assessments (Goldkamp, 1983; Lowenkamp, Lemke, & Latessa, 2008; Siddiqi, 2002; VanNostrand, 2003). In fact, there has been a national movement to improve pretrial release supervision and risk assessments, with validated evidence-based risk tools being recommended for all jurisdictions (Mamalian, 2011). In her recent article, Mamalian (2011) highlights an important distinction that is worth noting; pretrial risk assessments do not predict whether a specific defendant will fail, rather they provide a statistical probability of failure for defendants that have a specific score.

A number of studies have found that pretrial risk assessments can be used to increase the number of pretrial releases from the jail without negatively impacting pretrial outcomes (Baradaran & McIntyre, 2012; Pretrial Justice Institute, 2011; Siddiqi, 2005). In their study of a national dataset of over 117,000 pretrial defendants in urban counties between the years of 1990 and 2006, Baradaran and McIntyre (2012) concluded that, as a whole, we are largely holding the wrong pretrial defendants and that "up to 25% more defendants can be released pretrial while maintaining the same level of pretrial crime if we release a larger number of older defendants, defendants with clean records, and defendants charged with fraud and public-order offense" (pg. 502-503).

Lowenkamp et al. (2008) suggest that pretrial risk assessments can also be used to identify low, medium, and high risk offenders and that these levels can be used to match offenders to appropriate supervision levels and services. The importance of matching interventions to an offender's risk level has been well documented and researchers have found that providing intensive supervision or services to low risk offenders is ineffective and may actually result in worse outcomes for these offenders (Bonta, Wallace-Capretta, & Rooney, 2000; Latessa, Lovins, & Smith, 2010; Lowenkamp & Bechtel, n.d.). Some researchers have even suggested that pretrial risk tools be used to help judges or supervising agents identify areas of need and to determine appropriate levels of supervision (Lowenkamp & Bechtel, n.d.); however, Clark (n.d.) notes that these tools are only designed to inform custody decisions and that other instruments are available that are specifically designed to identify areas of need.

There is general consensus in the criminal justice field that no pretrial risk assessment is universally applicable and that tools need to be modified and validated for each jurisdiction that is using them. The Pretrial Justice Institute goes one step further and recommends that risk assessments not only be piloted and validated for the specific jurisdiction using them, but that they are also revalidated on a regular basis to ensure that they continue to retain their predictive validity (Clark, n.d.). A relatively recent validation study of a proxy assessment in Salt Lake County (Hickert & Próspero, 2008) highlights the importance of piloting an assessment locally. The Proxy Score Risk Assessment is a three-item (i.e., current age, age at first arrest, and number of prior arrests) pre-screening tool that was developed to quickly identify the high risk offenders who require an additional assessment (Bogue, Woodward, & Joplin, 2006). Although validated and used in Hawaii (Davidson, 2005), these researchers found that the total score was not a consistent predictor of recidivism for offenders booked into the Salt Lake County jail (Hickert & Próspero, 2008).

Locally validated pretrial risk assessments are valuable tools that offer a standardized and objective method of decision-making. Nevertheless, these tools are not foolproof, and a number of researchers have noted the importance of putting in place procedures that allow professional discretion to override the tool when appropriate (Austin, 2004; Andrews, Bonta, & Hoge, 1990; Latessa, Smith, Lemke, Makarios, & Lowenkamp, 2009). In fact, Austin (2004) suggests that when properly exercised, professional discretion can be used to prevent false positives or negatives. Nevertheless, these overrides should be an infrequent occurrence and should be monitored on a regular basis to ensure that individuals are not being mis-categorized and that the assessment tool does not need to be modified to meet an emerging need.

Pretrial Risk Factors

Several studies have examined pretrial risk and have found that the following factors increase a person's likelihood of pretrial failure: prior FTAs (Lowenkamp, Lemke, & Latessa, 2008; Siddiqi, 2002; VanNostrand, 2003), prior convictions (Baradaran & McIntyre, 2012; Bonta, Wallace-Capretta, & Rooney, 2000; Levin, 2011), current property offense (Austin, Krisberg, & Litsky, 1985; Baradaran & McIntyre, 2012; Maxwell, 1999), substance abuse (Lowenkamp, Lemke, & Latessa, 2008; VanNostrand, 2003), and younger age (Austin, Krisberg, & Litsky, 1985; Levin, 2007; Lowenkamp, Lemke, & Latessa, 2008). Pretrial research has also consistently found that people with current person and/or violent offense(s) are actually less likely to recidivate or miss court than other types of offenders (Lash, 2003; Levin, 2007; Maxwell, 1999). Although there has been some debate within the criminal justice field regarding which factors should be included on risk

assessments, recent studies seem to point toward static factors being better predictors of pretrial risk than dynamic factors (Bechtel, Lowenkamp, & Holsinger, 2011; Pretrial Justice Institute, 2011).

Although not a public safety issue, pretrial defendants who do not appear in court are not being held accountable and waste valuable court, law enforcement, and jail resources by dragging out the court process. Failure to appear (FTA) rates were on the higher end of the range (20-43%) in the recently conducted Salt Lake study (Hickert, Becker, & Prospero, 2010), compared to other jurisdictions that reported FTA rates between 10% (VanNostrand, 2003) and 42% (Goldkamp, 1983). Similarly, a 2009 national survey of county pretrial programs reported an FTA rate of 43% for felony-level pretrial defendants in Salt Lake County (Pretrial Justice Institute, 2009). According to this report, the FTA rate reported for Salt Lake was significantly higher than all of the other counties. In fact, the combined average FTA rate for all 40 counties reported on (including Salt Lake) was only 20%.

Nevertheless, safety is of utmost concern to the public and to judges, who researchers have shown place far greater weight on the perceived dangerousness of the offender than their likelihood of showing up for court when making pretrial release decisions (Baradaran & McIntyre, 2012). Research seems to indicate that, as a whole, defendants who are released pretrial pose very little risk to public safety. Recidivism rates among pretrial defendants in the Salt Lake study (Hickert, Becker, & Prospero, 2010) were on the lower end of the range (7-15%) compared to rates reported in the literature (12%: Austin, Krisberg, & Litsky, 1985; 28%: Goldkamp, 1983). Although improvements have been made in the field, much of the variance in recidivism is still not accounted for in the current risk tools that are available (Andrews, Bonta, & Wormith, 2006; Bonta, 2002; Gottfredson & Moriarty, 2006). Furthermore, prediction of risk (whether FTA or recidivism) becomes more difficult as base rates (e.g., percent FTA) deviate from 50% (Gottfredson & Moriarty, 2006).

The Current Study

At the beginning of 2011, the Salt Lake County Division of Criminal Justice Services (CJS) worked with Utah Criminal Justice Center (UCJC) researchers and consultants with the Salt Lake County Criminal Justice Advisory Council (CJAC) to create a list of pretrial pilot items for potential inclusion in the Pretrial Release Instrument (PRI). These items were compiled from previously validated instruments (e.g., VPRAI - VanNostrand, 2003; ORAS – Latessa et al., 2009) and covered many of the nine areas recommended by the National Association of Pretrial Service Agencies (NAPSA) in their 2004 Standards of Pretrial Release (Bechtel, Lowenkamp, & Holsinger, 2011).

The pretrial pilot items are completed by CJS screeners at the jail through an interview process that is typically conducted during the booking process. Certain items (e.g., jail booking reason, current offense drug-related, criminal history) are collected from official records, while others (e.g., age at first conviction, employment, substance abuse) are self-reported by offenders (see Table 3 on page 9 for the full list of pilot items and response categories). The current study was undertaken to determine which pilot items are significantly related to pretrial risk (as measured by FTA and recidivism) for the Salt Lake County jail population. In addition, UCJC examined several official criminal justice measures (e.g., prior arrests and bookings) to examine their predictive validity with pretrial failure. The purpose of this study is to identify a set of risk factors that best predicts pretrial failure and develop a new pretrial release instrument (PRI) that only includes those necessary pretrial screening items.

Methods

Sample Selection

CJS Jail Screeners implemented the new pretrial pilot items in July 2011. The three month period of August through October 2011 was selected for sample collection. During this time period, CJS jail Screeners conducted 4,986 pretrial pilot assessments. Just over 90% of them (4,494; 90.1%) were complete assessments, with answers entered on all items. From these complete assessments, 1,500 were randomly selected for inclusion in this study. Because court case numbers and hearing outcomes had to be gathered manually, a manageable, yet representative, random sample was flagged. Those 1,500 were randomly split into a developmental sample and a validation sample.

Further winnowing of included assessments occurred through the following steps in data cleaning and analysis. First, when those 1,500 assessments were merged with jail booking data, a few bookings had multiple assessments. In those instances, the more recent (later) assessment was selected (N = 1,496). The next step removed persons who were in the sample more than one time (duplicate bookings per person). The first booking per person was selected for inclusion in the study (N = 1,456). These bookings/assessments were split into two samples for analyses (Developmental sample = 727, Validation sample = 729; N = 1,456). These bookings are referred to as the Qualifying Booking (QB) in the remainder of the report.

The sample for tracking post-release failure to appear (FTA) was further limited to those cases that had court hearings prior to "case closure" where the individual was not incarcerated (at Salt Lake County Adult Detention Center (ADC) or another facility (e.g., USP, other county jail)). For the purposes of this study, "case closure" is defined as the first Sentencing (for unsentenced cases) or Order to Show Cause (OSC) hearing (for post-dispositional cases) occurring after the QB. This additional step was taken in order to ensure that FTA rates were only calculated for hearings occurring while the individual was "out in the community" so that hearings occurring while they were still incarcerated on the QB or on subsequent bookings were not counted for or against them. These additional steps reduced the sample for calculating FTA to 1,066 bookings/assessments (Developmental sample = 527, Validation sample = 539).

Sample Representativeness

At each point in the sample selection process, comparative analyses were conducted to determine if the remaining sample was significantly different from the previous one on key characteristics of the qualifying booking (QB). Not surprisingly, those bookings where pretrial pilot assessments were conducted (N = 4,986) were significantly different than those bookings during the same three month period (Aug-Oct, 2011) where assessments were not conducted by pretrial jail screeners (N = 2,981). Those who did not have pretrial pilot assessments were less likely to have new charges and more likely to have commitments, as well as more likely to be released after "time served" and less likely to be released to CJS supervision or bail/bond/cash/fine. These differences merely suggest that pretrial assessments are less likely to be conducted with those inmates who have the least likelihood of pretrial release (e.g., commitments).

Those who had complete pretrial pilot assessments (N = 4,494) did not differ significantly from those with incomplete assessments (N = 492) on any of the QB details. This suggests that there is no measurable bias on QB factors related to the completion of pretrial assessments. As expected, the randomly selected sample of completed assessments (N = 1,456) did not differ significantly from all

completed assessments on any of the QB details (i.e., booking types, release types, charge severity). Nor did the two samples (developmental and validation) within those 1,456 bookings differ significantly on any of the QB details. Lastly, those bookings that were included in the post-release failure to appear (FTA) analyses (N = 1,066), were compared to those that were excluded (N = 390). Offenders who were included in FTA analyses were significantly different than those who were not. Primarily, those included in the FTA analyses had even more characteristics of a typical pretrial release group (such as higher percent new charges, lower percent warrants/holds/commitments; more likely to be released on pretrial status (CJS supervision, bail/bond/cash/fine); lower severity of new offenses).

Data Sources

The following table (Table 1) lists the primary data sources for this study. Official criminal history measures from jail booking history (OMS) and statewide arrest and conviction history (BCI) were included as predictors in addition to items from the pretrial pilot items. The primary outcomes were failures to appear (FTAs) and pretrial recidivism, defined as a new charge booking between jail release and sentencing of court case(s) from the QB. In addition, a secondary outcome of short-term recidivism, defined as a new charge booking in the three months following QB release, was examined. This additional standard measure was included due to the varying lengths of time for court case resolution and the impact that variation has on recidivism.

In order for a data source to be of utilitarian value (in addition to predictive value), it must be easy to interpret during the course of a pretrial interview. For this reason, BCI data was thoroughly vetted by examination of the actual paperwork a pretrial jail screener would see when conducting an evaluation (e.g., rap sheet). This review led to the conclusion that BCI data was an unreliable measure of pretrial recidivism, as new arrests in a rap sheet or the BCI database could represent either new charges or arrests on warrants from old charges. As such, BCI arrests are not a reliable measure of new crime commission. However, this blended measure of arrests (either for new charges or warrants) was examined as a potential predictor of pretrial failure, as were convictions from BCI.

Table 1 Data Sources

Data Source	Description
Salt Lake County Sheriff's Office - OMS	
Jail Bookings	Jail booking history, including booking date, type, charges, and release date. Some information on release type, offender demographics, and court case numbers.
Criminal Justice Services (CJS) - C-track	
PTR Risk Assessment	28 items from PTR risk assessment implemented for this study
Pretrial Screening Table	Information about release type and exit status if CJS supervised
Utah Administrative Office of the Courts - CORIS/XChange	
Court Outcomes	Court case outcomes, including FTAs, dates of hearings, disposition, and sentencing for cases occurring in Utah courts.
Bureau of Criminal Identification (BCI)	
Statewide Criminal History File	Statewide arrest and conviction history by person by arrest date, type, and degree.

Analyses

The following analyses were conducted on the developmental sample that had post-release court appearances to track for failure to appear (n = 527). First, all potential predictors from the pilot items and official criminal history records were each examined in relation to failure to appear (FTA) and recidivism with bivariate tests to identify statistical significance. The individual factors that were examined comprised eight domains (see Table 2).

Table 2 Domains for Pretrial Risk Predictors

Domain	Description
Current Charges	Number, maximum severity, and type(s) (e.g., person, property, drug) at current booking
Current Noncompliance	Number of warrants at booking and current supervision (e.g., already on pretrial, probation, or parole)
Criminal History	Prior bookings, charge types and severity; arrest history, including number, types, and felony or misdemeanor; conviction history, including number, types, and severity; self-reported age at first conviction (including juvenile)
Noncompliance History	Prior warrant bookings and self-reported FTAs
Current Stability	Employment status, living situation, time in area
Substance Abuse and Mental Health	History and current problems with drugs, alcohol, and mental health issues
Demographics	Age and marital status
Other	Verification and current appearance items from PTR risk tool

The individual items that were statistically significantly related to pretrial failure (FTA and/or recidivism, up to case closure and/or up to 90 days post-release) were sorted on the strength of their relationship with pretrial failure. Items that had the strongest bivariate relationship with pretrial failure were selected for initial release tool modeling. Some additional predictors that were not initially strongly related to pretrial failure were included if they were common factors from the fourteen (14) pretrial risk instruments that were reviewed for this study and theoretically linked to pretrial failure.[1]

Decision tree analysis, specifically a classification and regression tree (CART) analysis, was used in order to develop a logic based decision model for the prediction of FTA and recidivism. Decision tree procedures like CART are a preferred method of determining the logic behind a binary decision rule. They are frequently used in medicine as a diagnostic tool to predict outcomes such as getting the flu (Afonso et al., 2010) or predicting periodontal disease (Nunn et al., 2000). In addition to having clinical relevance, they have also been utilized to build models predicting failure to appear

[1] These fourteen studies are indicated with an asterisk in the References list at the end of this study

in court (Winterfield, Coggeshall, & Harrell, 2003) and re-offending in the criminal population (Liu, Yang, Ramsay, Li, & Coid, 2011; Winterfield et al., 2003).

Decision tree methods such as CART are generally regarded as superior to other binary outcome modeling procedures (such as logistic regression) because they (1) are model free (there are no assumptions about linearity, for example), (2) accept any variable type (variables can be categorical, ordered, or continuous), and (3) are easily applied in decision making (one simply follows a decision tree to a terminal node or decision). In contrast, linear, curvilinear and logistic regression modeling procedures require assumptions about the data structure, can be difficult to translate between research and practical decision making, and yield global models that fail to consider complicated interactions unless they are modeled in advance ("Classification and Regression Trees," 2009).

The CART procedure, on the other hand, uses recursive partitioning, a technique which recognizes that different models may be necessary to represent outcomes at varying levels of the predictor variables. The CART procedure creates nodes, like branches from a tree, which maximize homogeneity within a node. Predictor variables are split, in a recursive fashion, until final or terminal nodes are as similar as possible with respect to the outcome and its predictors. The same variable can be split more than one time (hence the recursive partitioning), if subsequent splits yield better outcome prediction at various levels of other predictor variables. CART analysis, therefore, automatically detects important interactions across multiple levels of all predictors.

The resulting risk categories from the FTA CART and recidivism CART were examined by their defining characteristics (variables that created the nodes). Both models resulted in 8 terminal nodes. A single node was removed from each model due to the relatively small sample represented in each node, the statistical unimportance of the final delineating variable in the respective models, and/or the lack of theoretical basis for the removed nodes.

The two final risk scores (7 category FTA and 7 category recidivism) were compared against their respective outcomes (FTA prior to case closure and recidivism prior to case closure) to examine correct classification, sensitivity, and specificity. The AUC-ROC (Area Under the Curve-Receiver Operating Characteristics) method was used to assess both risk scores' predictive ability. The AUC methodology as an evaluation of overall measure performance is commonly used in medical research in which predicting binary outcomes is common (e.g., cancer screening), but is also commonly used in criminal justice as a method to evaluate a tool's efficacy in recidivism prediction (e.g., Cadigan, Johnson, & Lowenkamp, 2012; Ringland, 2011; Watkins, 2011).

The AUC value provided by such an analysis yields a measure of probability that a randomly selected positive instance of an outcome (here FTA or recidivism) will rank higher on the developed release measure than a randomly selected negative outcome. Although the value of the statistic, because it is a probability, varies from 0.0 to 1.0, a value of .5 is identical to guessing the outcome. A value that is significantly greater than .5 is desired for a measure with good discriminant validity, and typically a value of .7 is considered "good" in recidivism research (see Cadigan, Johnson, & Lowenkamp, 2012; though the value also depends on the field).

Once the instrument's AUC values were calculated on the developmental sample, the decision tree logic was applied to the validation sample in order to assess if the models were equally predictive with the new sample. The predictive ability with the validation sample was also tested using AUC-ROC procedures. Details of these test outcomes are discussed in the results section of this report.

Finally, analyses were performed to examine whether the instrument was equally valid for both males and females and for minority as well as non-minority groups. To examine whether these variables moderated predictive utility, logistic regressions were conducted with either gender or minority status added as a predictor of FTA or recidivism in addition to the respective risk score. As discussed in the results' section, differences in base rate FTA and recidivism were very similar between males and females and minority/non-minority groups. Though the groups are similar with respect to the rate at which these outcomes occur, the path to the outcomes might be different. Accordingly, a power analysis was conducted to determine the sample sizes required for future studies to detect significant differences between gender and minority status, and to perhaps differentially model risk by these groups.

Results

Pilot Risk Assessment Items

This section of the report presents pilot risk item results for both the developmental sample and the validation sample combined (prior to the removal of duplicate persons; N = 1,496). The two randomly selected samples were compared on all of the items presented in Table 3 and there were no statistically significant differences between the two groups. As the two groups were each randomly selected from the three month sample of pilot assessments, this lack of statistically significant differences was expected. The statistical equivalency of these two groups suggests that they both equally represent the larger pilot risk assessed sample from the three month period. The aggregate similarity of the two samples is also important for their use as the developmental and validation samples. Furthermore, responses to these pilot risk items were examined for the final 1,066 bookings that were tracked for FTA through case closure. The responses for this smaller group varied by 5% or less on each of the items. This indicates that the figures presented in Table 3 are also representative of those who have hearings following release from jail.

Table 3 Pretrial Pilot Items and Scores

PTR Risk Item (self-report unless otherwise noted)	**Variables**	**Percent** (unless noted)
1. OMS Booking Number [1]	--	--
2. Reason client booked into jail. [1]	New Charge	66
	Warrant	57
	Commitment/Other	3
3. Are you currently under any Court Ordered supervision?	No Supervision	80
	Salt Lake County Probation	3
	Pre-Trial Supervision	3
	AP&P Probation	12
	AP&P Parole	0.3
	Other Supervision	4
4. Are you currently ordered to complete a Pre-Sentence report?	Yes	2
5. *Do you have any charges pending in any court at the present time? [3]	Yes	18

PTR Risk Item (self-report unless otherwise noted)	**Variables**	**Percent** (unless noted)
6. Age of first Conviction.	Yes, prior Conviction(s)	72
	Age of first (Mn (Sd))	21 (7)
7. *How many times in the last two (2) years have you missed a scheduled court appearance?	0 times	63
	1 time	21
	2+ times	16
8. Marital Status	Single	58
	Married	18
	Divorced/Separated	19
	Widowed	1
	Domestic Partner/Cohabitating	4
9. *Employment status.	Full Time	45
	Part Time	13
	Student	3
	Caregiver/Stay at home parent	1
	Retired/Disabled	4
	Unemployed	34
10. Time in current Employed/Unemployed status? (*in years*)	Employed Full Time (Mn (SD))	3.3 (5.0)
	Employed Part Time (Mn (SD))	2.4 (3.3)
	Unemployed (Mn (SD))	1.5 (3.5)
11. *During the last two years have you been Unemployed for longer than 30 days?	Yes	61
12. Time in Salt Lake County? (*in years*)	(Mn (SD))	18.8 (14.8)
13. Where do you currently live?	Permanent Housing	88
	Temporary Housing	7
	Homeless	5
14. *How long have you been at your current Residence? (*in years*)	Permanent Housing (Mn (SD)	4.5 (6.7)
	Temporary Housing (Mn (SD)	1.2 (3.7)
	Homeless (Mn (SD)	1.5 (3.6)
15. Do you have any Mental Health issues for which you are currently being treated?	Yes	15
16. Do you have a History of treatment for Mental Health issues?	Yes	11
17. Are you having any thoughts of Suicide?	Yes	1
18. Is the use of Alcohol related to current offense? [1]	Yes	30
19. Is the use of Illegal Drugs or Non-Prescribed Drugs related to the current offense? [1]	Yes	27
20. *Do you have a History of using Illegal Drugs?	Yes	47
21. Have you participated in treatment for Substance Abuse?	Yes , previously in treatment	32
	Yes, currently in treatment	5

PTR Risk Item (self-report unless otherwise noted)	Variables	Percent (unless noted)
22. Have you used illegal drugs (or non prescribed medications) in the last 30-days?	Yes	24
23. Do you believe you have a Substance Abuse problem?	Yes	20
24. Do you believe that you would benefit from Substance Abuse treatment?	Yes	23
25. Is there an alleged Victim of the current offense?	Yes	27
26. The client appeared? [2]	Stable	91
	Cooperative	98
	Other	8
27. Criminal History. [1]	Yes, prior conviction(s)	70
28. Verified Residence and/or Employment with References.	Did not attempt to contact	59
	Unsuccessful in contacting	8
	Successful in contacting	33
	Residence verified	71
	Employment verified	67

*Indicates items from the Virginia Pretrial Risk Assessment Instrument (VPRAI) (Van Nostrand, 2003)
[1] Based on official records (e.g., law enforcement, jail, state criminal history (BCI))
[2] Based on pretrial jail screener's perception and observations
[3] Marked as "yes" if offender had at least one pre- adjudicated case pending that was not part of their current booking

Offender Characteristics

A majority of offenders reported that they were single (58%) or divorced/separated (19%) at the time of their booking. Over half were employed either full-time (45%) or part-time (13%), and had been in their current job for two or three years on average. About one-third of offenders (34%) reported that they were currently unemployed at the booking; however, 61% of offenders reported being unemployed for longer than 30 days at some point during the previous two years. Most offenders claim to have been in the area for many years (average 18.8 years in Salt Lake County) and to be stably housed (88% in permanent housing, average of 4.5 years).

Criminal/Court History

Offenders who completed the pilot items were most often booked into the jail on a new charge (66%) or warrant (57%, warrant of arrest or bench warrant). A majority of offenders (80%) were not on any type of court ordered supervision and only 2% reported that they had been ordered to complete a Pre-Sentence report. Only 18% of offenders reported that they had pending charges at the time of their booking. This percent was much smaller than researchers were expecting, and upon closer examination it was determined that screeners were only marking "yes" if the offender had at least one pre-adjudicated case pending that was not part of their current booking. In other words, any active warrants of arrest (WA) or bench warrants (BW) that were part of this jail booking were not included in this figure.

In an attempt to determine the accuracy of the self-reported "charges pending" data, UCJC researchers conducted sub-analyses on offenders who were booked into the ADC during the first week that pilot assessments were conducted (August 1-7, 2011). All offenders who were booked into the jail on a WA or BW were flagged as having a pending charge and Court records were searched for all other individuals to determine if they had any other open cases (pre- or post-adjudication) at the time of this booking. Individuals found to have pending charges in the court records were added to those booked with WA or BWs for the sample of offenders with any charges pending at the time of the booking. Based on these broader selection criteria, 72% of the offenders booked into the jail during this week were found to have pending charges at the time of their booking, compared to the 18% of the subsample that self-reported pending charges. During this one week time period, the self-reported pending charge(s) matched the official record less than half of the time (42%); however, as was stated in the previous paragraph, this drastic difference is most likely due, in part, to the different definitions used by the jail screeners and the researcher to determine what qualified as "pending charges." Furthermore, the VPRAI item that item #5 "pending charges" is supposed to replicate is defined as follows:

> "Pending Charge(s)—Select yes if the defendant had one or more charges pending in a criminal or traffic (not civil) court at the time of arrest. Pending charge(s) require that the defendant was previously arrested for one or more charges and had a future court date pending at the time of arrest. Select no if the defendant had no pending charge(s) at the time of arrest." (Van Nostrand, 2003, p. 19)

Nearly three-quarters (72%) of offenders reported a prior conviction and, on average, their first conviction was at age 21. Just over one-third (37%) of offenders reported that they had missed at least one scheduled court appearance during the previous two years. In order to check the accuracy of this item, researchers compared self-reported and official court data for the first week of August. For this subsample, 42% of offenders reported missing any court appearances during the previous two years and half of these offenders (21%) reported missing two or more. Official court records show a significantly higher percent of offenders with any missed court appearances (66%) during the previous two years, and a surprising high percent (50%) of offenders with two or more. Self-report and official records matched for just over half (51%) of offenders and closer examination suggests that offenders who self-report no missed court appearances often had one, while those who reported missing one actually missed two or more.

Mental Health and Substance Abuse

Few offenders reported current (15%) or previous (11%) treatment for mental health issues and only 1% of offenders reported having any thoughts of suicide at the time of their booking. About one- third of the bookings included a current offense that was related to the use of alcohol (30%) or illegal drugs (27%, including non-prescribed medications). It should be noted that these two items are not mutually exclusive, and some offenders may have had offenses related to both alcohol and drugs. Nearly half (47%) of offenders reported a history of drug use and 24% reported recent (within the past 30 days) drug use. About one-third (32%) of offenders reported previous participation in substance abuse treatment and only 5% were currently enrolled in treatment. Most respondents identified themselves as not having a drug problem (80%) and felt that they would not benefit from substance abuse treatment (77%); however, a few (5%) said that although they do not believe that they have a drug problem, they do think they would benefit from treatment.

Official Record Items

In addition to the pilot items, several measures from official records were included as potential predictors of pretrial failure. This section presents descriptive statistics for the developmental and validation samples combined (N = 1066) for many of the items that were statistically significantly related to pretrial failure in the bivariate analyses. Some additional variables from official records (e.g., demographics) are also included in this section to further describe the sample. The developmental (n = 527) and validation (n = 539) samples did not differ statistically significantly on any of the factors in this section. Again, this illustrates the statistical equivalence of these two randomly selected groups.

As shown in Table 4, most of the pretrial release sample were male, White, and an average of 32 years old at their release. Table 5 shows that the most had either a new charge (66%) or warrant (60%) at their qualifying booking (booking types in Table 5 are not mutually exclusive).

Table 4 Demographics for Pretrial Release Sample

Demographics	
Gender (%)	
Female	25
Male	75
Race/Ethnicity (%)	
White	66
Hispanic	20
African American	5
Asian	2
Pacific Islander	4
Native American/Alaskan Native	3
Age	
Mn (SD)	32.8 (10.7)
Age Groups: (%)	
Under 21	10
21 to < 25	18
25 to <30	20
30 to <40	27
40+	25

Table 5 Qualifying Booking Types for Pretrial Release Sample

	Number at Qualifying Booking				
	0	1	2	3	4+
Warrants (%)	40	22	14	11	13
Holds (%)	97	2	<1	<1	<1
New Charges (%)	34	17	21	16	12

Of those with a new charge at the qualifying booking (QB), most were misdemeanors, while traffic, DUI, and person were the most common offense types (see Table 6). The largest percent of the

pretrial release sample was released with no conditions specified[2] (41%), this means that they were released on own recognizance, order of release, or some other release category in OMS that indicated no supervision or criteria. Just over a quarter (28%) were released on some type of financial criteria (i.e., bail, bond, fine, or cash), while one quarter (25%) were released to CJS supervision (pretrial release by CJS staff at jail or court ordered to pretrial supervision at CJS).[3] Only 6% were released to "another authority." For these cases, OMS records indicated that the person was released to Utah Department of Corrections (UDC), Adult Probation and Parole (AP&P), federal agency (e.g., ICE), or another jurisdiction (e.g., county or state). The majority of the sample (51%) had only Justice court cases at their pretrial release, while 29% had only District court cases, and 20% had both District and Justice cases. The average length of time from pretrial release until final case closure[4] was over 5 months (Md = 4 months).

Table 6 Qualifying Booking Details for Pretrial Release Sample

Qualifying Booking	
Maximum Severity of New Charge(s) (%)	
No new charges	34
Misdemeanor	43
Felony	23
New Charge Type (%)	
Person	18
Domestic Violence[1]	5
Violent[1]	17
Property	17
Drug	16
DUI	20
Traffic	21
Obstructing Law Enforcement	7
Weapon	2
Release Type (%)	
No Conditions Specified	41
Bail/Bond/Cash/Fine	28
CJS Supervision	25
Other Authority	6
Court Cases at Release (%)	
District Case(s) Only	29
Justice Case(s) Only	51
Both District & Justice Cases	20

[2] Multiple release categories in OMS were examined for each qualifying booking and the "most restrictive" was selected based on this order of least to most restrictive: no conditions, financial conditions, CJS supervision, release to other authority.

[3] CJS release categories were comprised of those who had CJS release indicated in their OMS record and confirmed in CJS C-track records. If there was a discrepancy, CJS C-track records were used to identify cases as CJS supervised.

[4] Final case closure is the latest/final disposition or sentence date for all of the court cases that the person had at their qualifying booking. One hundred forty eight (148) of the 1066 releases (14%) had at least one court case that was not yet closed at the time of the follow-up period ending. For those cases, final case closure date was set as the follow-up period end date (10/31/12) and only hearings up to that date were included in the FTA analyses. For those, 14% of releases, average follow-up from jail release to 10/31/12 was 13 months (Mn = 398 days; Md = 402 days).

Qualifying Booking	
Days from Jail Release to Final Case Closure	
Mn (SD)	167 (132)
25th Percentile	60
50th Percentile	125
75th Percentile	258

[1]Offenses flagged as domestic violence and violent fell entirely within person offenses and are presented for descriptive purposes only

The next two tables describe the official criminal justice history for the pretrial release sample. Both two year and five year OMS booking histories were examined for the sample. All of the two year measures had the same relationship with pretrial failure as the five year measures. Because of this, two year measures were selected for reporting, as they will be more convenient for pretrial screeners to look-up than a longer jail history.

Most of the sample (56%) had not been booked into the jail during the previous two years; however, one quarter (25%) had two or more bookings (see Table 7). The sample had an average of three (3) prior convictions (see Table 8); however, it ranged from 0 to 59, with 37% not having any prior convictions (not shown in Table 8). There was an average of 7.5 prior statewide arrest episodes (BCI; Median = 4). Each new arrest date was counted as a single arrest episode. As previously noted, an arrest in the BCI record could indicate new charge(s) or an arrest on an outstanding warrant.

Table 7 Two Year Jail History for Pretrial Release Sample

	In 2 Years Prior to Qualifying Booking		
Percent with (%)	0	1	2+
Total Bookings	56	19	25
Warrant Bookings	66	17	17
New Charge Bookings	67	21	12
Commitment Bookings	85	11	4
Bookings w/ these offense types:			
Person	90	8	2
Violent[1]	91	8	1
Property	87	10	3
Drug	87	11	2
Public Order	92	5	3
Obstructing Law Enforcement	95	4	1

[1] Offenses flagged as violent fell entirely within person offenses and are presented for descriptive purposes only

Table 8 BCI Arrest and Conviction History for Pretrial Release Sample

	Mn (SD)	Md	Min-Max
Conviction History			
Total	3.0 (4.6)	1	0-59
Misdemeanor[1]	2.2 (3.4)	1	0-50
Felony	0.5 (1.2)	0	0-10

	Mn (SD)	Md	Min-Max
Person	0.4 (1.0)	0	0-9
Violent[2]	0.4 (0.9)	0	0-9
Arrest History			
Lifetime Total Episodes	7.5 (9.7)	4	0-118
Lifetime Misdemeanor Episodes[3]	4.7 (6.9)	3	0-90
Lifetime Felony Episodes	2.1 (3.1)	1	0-21
2-Year Prior Episodes	2.8 (3.1)	2	0-33

[1]Misdemeanor convictions are those where the most serious offense on the OTN was a misdemeanor

[2]Violent convictions included most person convictions, including simple assault

[3]Misdemeanor arrest episodes are those where the most serious offense on the arrest date was a misdemeanor

FTA and Recidivism Rates

The primary sample for this study includes the 1,066 persons/bookings (Developmental sample = 527, Validation sample = 539) that had court appearance/failure to appear (FTA) tracked for all of the court cases that were part of their qualifying booking (QB) and had hearings following release from jail. This primary sample is necessary so that the two outcomes of interest, FTA and recidivism, can be predicted within the same persons/bookings. The FTA and recidivism rates reported in this section are for the Developmental (n = 527) and Validation (n = 539) samples combined. The two groups were compared on FTA and recidivism rates and, as expected, did not differ significantly on any of the outcomes.

Through Case Closure

As shown in Table 9, on the following page, 46% of all releases (regardless of type; e.g., own recognizance, bail, pretrial supervision) failed to appear (FTA) at one or more of their hearings following jail release (n = 491). All hearings following QB release where the person was not in custody (e.g., not re-booked into ADC or in-custody at another jail or prison) were tracked through case closure. Case closure was defined as the sentencing date for new charges that were convicted, the disposition date for new charges that were dismissed, and the re-sentencing date for warrants/old charges that had hearings to resolve the case after release from jail. Although nearly half (46%) of the sample missed at least one scheduled court appearance, very few attended none of their hearings (13%) or less than half (29%).

Recidivism prior to case closure was less frequent (see Table 9), with only 15% (n = 164) having a new charge booking prior to their case(s) being closed. The most severe offense among recidivists was usually a 2nd Degree Felony (28%), followed by a Class B Misdemeanor (23%). Multiple offense types could be present at recidivism events. Drug (42% of recidivists) and property (41%) were the most common types of new offenses. Offenses were given additional flags if they were domestic violence, sex, or violent offenses. Ten recidivists (6% of 164) had a domestic violence related offense, while 1% had a sex related offense, and 23% had violent offenses (most person offenses were flagged as violent, including simple assault). Pretrial recidivism was limited to new charge bookings at the ADC, as new BCI arrests could occur for either a new criminal offense *or* an arrest on an outstanding warrant. As such, BCI arrests would inflate the measure of new criminal conduct.

Combined pretrial status failure was 49%, indicating that almost half of the offenders released pretrial (across all release types; e.g., own recognizance, bail, pretrial supervision) either failed to appear for one or more of their scheduled court hearings and/or had a new charge prior to case closure.

Table 9 FTA and Recidivism Rates – Through Case Closure for Pretrial Release Sample

Failure to Appear (%)	**46**
Appearance Rate (%)	
No Appearances	13
1-25% of Hearings	3
26-50% of Hearings	13
51-75% of Hearings	11
76-99% of Hearings	6
100% of Hearings	54
Recidivism – New Charge Booking (%)	**15**
Of those, maximum severity (%)	
Class C Misdemeanor	10
Class B Misdemeanor	23
Class A Misdemeanor	13
3rd Degree Felony	21
2nd Degree Felony	28
1st Degree Felony	5
Of those, types (%)	
Person	25
Property	41
Drug	42
Public Order	21
DUI	7
Combined Pretrial Failure (%)	**49**

Up to 90 days Post-Release

Pretrial failure rates were somewhat less when only tracked through 90 days following QB release. For those that had at least one hearing date within 90 days post-release (n = 944 of 1066), the FTA rate was 42% (n = 400), with 18% attending no hearings. Within 90 days of release, 10% (n = 104 of 1066) recidivated. Within this shorter time-frame, the most severe offense was usually a Class B Misdemeanor (29%), followed by a 2nd Degree Felony (23%). Property offenses were the most common, with 47% of those who recidivated having that type of offense. Four recidivists (4% of 104) had a domestic violence related offense, while 3% had a sex related offense, and 18% had violent offenses (most person offenses were flagged as violent, including simple assault).

Table 10 FTA and Recidivism Rates – Up to 90 Days Post-Release for Pretrial Release Sample

Failure to Appear (%)	**42**
Appearance Rate (%)	
No Appearances	18
1-25% of Hearings	2
26-50% of Hearings	12
51-75% of Hearings	8
76-99% of Hearings	2
100% of Hearings	58
Recidivism – New Charge Booking (%)	**10**
Of those, maximum severity (%)	
Class C Misdemeanor	11
Class B Misdemeanor	29
Class A Misdemeanor	15
3rd Degree Felony	18
2nd Degree Felony	23
1st Degree Felony	4
Of those, types (%)	
Person	23
Property	47
Drug	36
Public Order	23
DUI	8
Combined Pretrial Failure (%)	**42**

Factors Related to FTA

The developmental sample (n=527) was used to identify factors that were related to pretrial failure to appear (FTA). The factors that had the strongest relationship to FTA in bivariate analyses,[5] as well as a few additional predictors that were theoretically important, were entered into a CART decision tree analysis. Eight (8) variables were loaded into the CART analysis and five (5) were significant in classifying the resulting risk categories (see Table 11). As shown in Table 11, no factors relating to "current stability" were included in the model, as there were no variables from this domain that were strongly related to FTA in the bivariate analyses.

The CART decision tree resulted in eight (8) terminal nodes (risk categories). However, a single risk category was removed from the final FTA risk variable due to its lack of theoretical basis.[6] Cases in this node were forced into preceding nodes based on logical criteria (i.e., based on the group to which the cases belonged before the split into the deleted terminal node). The remaining seven risk categories were coded into a single FTA risk variable that ordered the seven categories from least

[5] See Appendix A for a list of all of the factors that were examined in relation to pretrial failure and their statistical significance in bivariate analyses.

[6] The deleted node was defined by only two criteria: having 1+ warrants at the qualifying booking and being > 29.5 years old at first self-reported conviction.

to most FTA risk. The final FTA risk variable also used whole numbers for the defining factors, rather than the decimal-level factors in the original CART tree (e.g., < 52 rather than <= 51.833 years old at the booking). Table 12 presents the final 7-level FTA risk variable and the defining characteristics for each of the seven (7) levels from least (Risk Level 1) to most (Risk Level 7) FTA risk.

Table 11 Factors Related to FTA

Domain	Variables into CART Decision Tree Analysis
Current Charges	Obstructing Law Enforcement Charge (Y/N)*
Current Noncompliance	Number of Warrants at QB*
Criminal History	Age at First Conviction (including juvenile, self-report)* New Charge Bookings in Last 2 Years (0, 1, 2+)
Noncompliance History	Warrant Bookings in the Last 2 Years (Y/N) FTAs in the Last 2 Years (self-report, 0, 1, 2+)
Current Stability	--
Substance Abuse and Mental Health	Substance Abuse Problem (self-report, Y/N)*
Demographics	Current Age*

*variable significant in classifying resulting risk categories in CART analysis

As shown in Table 12 on the following page, the group who has the least risk of failing to appear (FTA) during the pretrial release period (Risk Level 1) do not have any warrants at the current booking, do not have a new obstruction of law enforcement offense at the current booking (e.g., resisting arrest or false information to police), and were 16 or older at the time of their first self-reported conviction. Appendix B presents the distribution of the sample across the seven (7) risk levels, as well as the percent who fail to appear (FTA) at each level. The lowest risk group (Level 1) comprises 33% of the developmental sample (that the model was created from), with 22% of this group failing to appear for at least one of their scheduled hearings during pretrial release. As previously noted in Table 9 on page 17, 46% of the overall sample had an FTA, so the lowest risk group is less than half as likely to FTA as the overall sample. On the other hand, the group who has the most risk of FTA is defined by having one or more warrants at their current booking and self-reporting a substance abuse problem (see Risk Level 7 in Table 12). This highest risk group is only 12% of the developmental sample, but 72% of them have an FTA (shown in Appendix B).

The validation sample is also graphed in Appendix B and shows a similar relationship between FTA risk level and likelihood of FTA; however, the discriminant validity was not as strong with the validation sample. The AUC-ROC test that examined the average sensitivity (ability to correctly identify true positives: those who FTA) and specificity (the ability to correctly identify true negatives: those who do not FTA) of the FTA risk score on the validation sample had an overall test value of .66 (compared to .70 for the developmental sample). Values of .70 or greater are considered to have good predictive and discriminant validity for a tool in recidivism research (see Cadigan et al., 2012). Though lower than ideal, the value still suggested that the tool was significantly different from a model based on chance ($p<.001$), and the values of the two independent AUC curves (developmental and validation) were not statistically different from one another ($p=.140$).

Table 12 FTA Risk Level Descriptions

FTA Risk Level	Defining Characteristics from CART Decision Tree Analysis
1	No Current Warrants No Current Obstruct LE offenses Age at 1st Conviction >= 16 or doesn't have a prior conviction
2	Has 1+ Current Warrants No Substance Abuse Problem (self-report) Current Age >= 52
3	No Current Warrants No Current Obstruct LE offenses Age at 1st Conviction < 16
4	Has 1+ Current Warrants, but less than 4 No Substance Abuse Problem (self-report) Current Age < 52
5	No Current Warrants Has Current Obstruct LE offense(s)
6	Has >= 4 Current Warrants No Substance Abuse Problem (self-report) Current Age < 52
7	Has 1+ Current Warrants Has Substance Abuse Problem (self-report)

Factors Related to Pretrial Recidivism

The developmental sample (n=527) was used to identify factors that were related to pretrial recidivism (defined as having a new charge booking between release and final court case closure). The factors that had the strongest relationship to recidivism in bivariate analyses,[7] as well as a few additional predictors that were theoretically important, were entered into a CART decision tree analysis. Eleven (11) variables were loaded into the CART analysis and four (4) were significant in classifying the resulting risk categories (see Table 13). As shown in Table 13, no factors relating to "current noncompliance" were included in the model, as there were no variables from this domain that were strongly related to recidivism in the bivariate analyses.

The CART decision tree was modeled weighting false negatives (saying individuals were not recidivists, when in fact they were) as four times more costly than false positives (saying individuals were recidivists when in fact they were not). This method was employed to emphasize the importance of correctly identifying pretrial recidivists in this model (as a matter of public safety), and was important due to the low base rate of pretrial recidivism in the sample (only 15% overall recidivated pretrial).

The CART decision tree resulted in eight (8) terminal nodes (risk categories). However, a single risk category was removed from the final recidivism risk variable due to (1) the lack of statistical importance of the predictor that created this node in the CART model (relative importance was .8% for self-reported substance abuse), and (2) the small sample size in the node (which creates

[7] See Appendix A for a list of all of the factors that were examined in relation to pretrial failure and their statistical significance in bivariate analyses.

susceptibility to over-fitting). Cases in this node were forced into preceding nodes based on logical criteria (i.e., based on the group to which the cases belonged before the split into the deleted terminal node).

Table 13 Factors Related to Recidivism

Domain	Variables into CART Decision Tree Analysis
Current Charges	Property Charge (Y/N)
Current Noncompliance	--
Criminal History	Lifetime prior arrest episodes (BCI)* Age at First Conviction (including juvenile, self-report)* New Charge Bookings in Last 2 Years (0, 1, 2+) Property New Charge Booking in Last 2 Years (Y/N)* Person New Charge Booking in Last 2 Years (Y/N)
Noncompliance History	Warrant Bookings in the Last 2 Years (0, 1, 2+)
Current Stability	Current Employment Status
Substance Abuse and Mental Health	Substance Abuse Problem (self-report, Y/N) History of Using Drugs (self-report, Y/N)
Demographics	Current Age*

*variable significant in classifying resulting risk categories in CART analysis

The remaining seven risk categories were coded into a single recidivism risk variable that ordered the seven categories from least to most recidivism risk. The final recidivism risk variable also used whole numbers for the defining factors, rather than the decimal-level factors in the original CART tree (e.g., >= 33 rather than >= 33.388 years old at the booking). Table 14 presents the final 7-level recidivism risk variable and the defining characteristics for each of the seven (7) levels from least (Risk Level 1) to most (Risk Level 7) recidivism risk.

As shown in Table 14 on the following page, the group with the least risk of pretrial recidivism (Risk Level 1) has six (6) or fewer lifetime prior BCI arrests, no property new charge bookings in the last two years (OMS), and is currently 24 years old or older. Appendix C presents the distribution of the sample across the seven (7) risk levels, as well as the percent who recidivate at each level. The lowest risk group (Level 1) comprises 43% of the developmental sample (that the model was created from), with 5% of this group recidivating. As previously noted in Table 9 on page 17, 15% of the overall sample recidivated, so the lowest risk group is about one-third as likely to recidivate as the overall sample. For risk levels five (5) and six (6), the likelihood of pretrial recidivism is just over 30%, which represents twice the likelihood of recidivism as the overall sample (which is 15%). However, it should be noted that, for these risk levels, the outcome means there is still almost a 70% likelihood that these groups *will not* recidivate during the pretrial release period. This suggests a relatively low overall risk and highlights why these individuals were released pretrial and, therefore, included in our sample to track pretrial success/failure.

The validation sample is also graphed in Appendix C and shows a similar relationship between recidivism risk level and likelihood of recidivism; however, the discriminant validity was not as strong with the validation sample. The AUC-ROC test that examined the average sensitivity (ability to correctly identify true positives: recidivists) and specificity (the ability to correctly identify true negatives: non-recidivists) of the recidivism risk score on the validation sample had an overall test value of .71 (compared to .76 for the developmental sample). However, both are above .70, which is

considered to indicate good predictive and discriminant validity for a tool in recidivism research (see Cadigan et al., 2012). Though the AUC value was lower in the validation sample, the values of the two independent AUC curves (developmental and validation) were not statistically different from one another (p=.225).

Table 14 Recidivism Risk Level Descriptions

Recidivism Risk Level	Defining Characteristics from CART Decision Tree Analysis
1	6 or fewer lifetime prior arrests (BCI) No property new charge bookings in last 2 years (OMS) Current Age >= 24
2	More than 6 lifetime prior arrests (BCI) No property new charge bookings in last 2 years (OMS) Age at 1st Conviction < 21 or doesn't have a prior conviction Current Age >= 33
3	6 or fewer lifetime prior arrests (BCI) No property new charge bookings in last 2 years (OMS) Current Age < 24
4	More than 6 lifetime prior arrests (BCI) No property new charge bookings in last 2 years (OMS) Age at 1st Conviction < 21 or doesn't have a prior conviction Current Age < 33
5	More than 6 lifetime prior arrests (BCI) No property new charge bookings in last 2 years (OMS) Age at 1st Conviction >= 21
6	27 or fewer lifetime prior arrests (BCI) Has a property new charge booking(s) in the last 2 years (OMS)
7	More than 27 lifetime prior arrests (BCI)

Validation Sample

As noted in the previous two sections and displayed in Appendices B and C, both the FTA risk level and the recidivism risk level showed a similar relationship between higher risk scores and more pretrial failure in the validation sample (n = 539) as they did with the developmental sample (n = 529) that was used for the risk model creation. However, the predictive ability was not as strong within the validation sample and the relationship between higher risk scores and higher pretrial failure was not perfectly linear. The difference in pretrial failure between the developmental and validation samples was especially noticeable in the risk levels with the fewest releases (FTA risk levels 2, 3, and 5; recidivism risk levels 2, 4, 5, and 7). For example, only 4% of the developmental sample and 3% of the validation sample fell within recidivism risk level 7. Within the developmental sample, 70% of risk level 7 recidivated compared to 47% of the validation sample. Although this difference was quite large between the two samples, risk level 7 did have the highest recidivism by far (compared to the previous risk levels) in both samples. As previously noted in the AUC-ROC tests, both the FTA and recidivism risk levels performed reasonably well in both samples, and significantly better than chance.

Predictive Ability by Gender and Minority Status

The validation sample was also used to examine whether the FTA risk instrument and recidivism risk instrument performed equally well with males and females, as well as White and minority groups. In the FTA and recidivism models, gender and minority status failed to reach statistical significance, suggesting that the predictive utility of the risk tools was not moderated by either gender or minority status. However, because of the relative similarity in pretrial failure rates between males and females, as well as Whites and minorities (see Table 15), and because of the relatively low squared multiple correlations between these outcomes and the risk instruments, identifying statistically significant differences as a function of these variables would have been unlikely. Additionally, modeling these demographic variables as a function of the risk score was beyond the scope of this study.[8]

Despite a lack of significant differences, pretrial failure for each group was graphed by FTA risk level (see Appendix D) and recidivism risk level (see Appendix E) and examined for trends. As shown in Appendix D, the trend of increased likelihood of FTA by increasing risk level held true for the four groups (male, female, White, minority) when the largest categories (risk level 1 and 4) and extreme categories (risk level 1 and 7) were examined. However, among the categories that made up a small percent of the samples, the trend between risk level and FTA was not as clear. A similar pattern was observed for the four groups on pretrial recidivism (see Appendix E), with higher risk scores, in general, being associated with more recidivism, but much variation present in the risk levels with few cases.

Table 15 Pretrial Failure by Demographics for Validation Sample

Overall Failure to Appear (%)	**46**
Females	48
Males	45
White	44
Minority	49
Overall Recidivism (%)	**15**
Females	14
Males	15
White	13
Minority	18

Proposed Items for Risk Assessment and Risk Scores

A seven (7) item pretrial release instrument (PRI) is suggested that includes the five (5) variables that were in the significant FTA CART model and the four (4) variables that were in the significant recidivism CART model (two variables overlapped). As shown in Table 16, the suggested PRI would include one item for the jail screeners to look up in the official BCI record, four items for the jail

[8] If future studies want to examine whether the prediction of FTA or recidivism, as measured by these tools, is gendered or dependent on minority status, the following sample sizes (calculated using Gpower with z-tests and logistic regression, r-squared values of .001, and power set to .8) are recommended based on obtained power in the current sample: gender and FTA, 9,600; gender and recidivism, 52,800; minority status and FTA, 2,210; minority status and recidivism, 944.

screeners to look up in the previous jail booking history (OMS data), and two items for the jail screeners to ask in their interview. Based on the answers to these seven (7) items, both a FTA risk score and recidivism risk score can be computed. UCJC has created an Excel spreadsheet that automatically computes both risk scores when the answers to these items are entered in the spreadsheet. Computations for both risk scores based on these seven items will also be provided to CJS to use in creating the PRI within their database (C-track).

Table 16 Proposed Pretrial Release Instrument (PRI)

Source	Item
BCI	Total Number (#) of Prior Arrests in BCI Rap Sheet (leave blank if no rap sheet)
OMS	Has a New Property Charge Booking in Last 2 Years (Y = 1, N = 0)
OMS	Current Age (enter whole number)
OMS	Current Outstanding Warrants (WA, BW, SU; enter whole number, count by offense rows at this booking (not court cases))
OMS	Has Obstructing Law Enforcement New Charge at this booking (Y = 1, N = 0)
Offender Self-Report	Age at 1st Conviction (include juvenile; enter whole number)
Offender Self-Report	Do you believe you have a Substance Abuse problem? (Y = 1, N = 0)

Combined Risk Scores

Salt Lake County may also include additional non-scored items on their pretrial interview and screening that are not related to pretrial failure (i.e., FTA or recidivism risk) for purposes of assessing needs and providing services or conditions of release. For example, although employment, living situation, and mental health were not significantly related to pretrial failure, they may be important items for addressing needs upon release, as well as inform the type of conditions (i.e., call-in vs. in person check-ins) required during pretrial release. Stakeholders should examine what additional items they would like included in the pretrial interview, although they should not be used to increase or decrease FTA and recidivism risk scores.

Based on the seven (7) items in Table 16 above, both a FTA risk score (range 1-7) and recidivism risk score (range 1-7) will be created. Appendices B and C show the corresponding probabilities of failure associated with each of those scores. In addition, because individuals are released based on information about *both* their FTA and recidivism likelihood, pretrial failure by combined risk scores are presented in Appendices F and G. Combined risk scores were created by examining the percent of jail releases (for the entire pretrial release sample; n = 1066) across the two risk scores (see Table 17 on the following page). Suggested cut-points for low, moderate, and high are also displayed in Table 17. These cut-points were developed based on the distribution of cases across these levels (see Table 17), as well as the percent of failures across the levels (see Appendices B and C) and the balance of sensitivity and specificity[9] at each risk score.

[9] Sensitivity is the ability to correctly classify true positives (e.g., identifying recidivists as recidivists), while specificity is the ability to correctly classify true negatives (e.g., identifying non-recidivists as non-recidivists). The placing of cut-points along the release measure is as much theoretical as it is statistical. Increasing or decreasing cut-points necessarily creates a tradeoff between true positives and false positives. For example, if a cut-point is set to a lower point on the release measure, it will capture more true FTA and recidivist cases, but it will also

Table 17 Pretrial Release Sample by FTA and Recidivism Risk Levels

		FTA Risk Levels						
		Low	Moderate				High	
Recidivism Risk Levels		1	2	3	4	5	6	7
Low	1	19%	38%				12%	
Moderate	2							
	3							
High	4	18%					10%	
	5							
	6							
High-2	7	4%						

Appendix F displays the combined risk score with six (6) levels. It includes individuals who are (1) low on both FTA and recidivism risk (19% of pretrial release sample, see Table 17), (2) low or moderate on both (38% of sample), (3) high on FTA but low/moderate on recidivism (12% of sample), (4) low/moderate on FTA but high on recidivism (18% of sample), (5) high on both (10% of sample), and (6) extremely high on recidivism (High-2 in Table 17), regardless of FTA risk (4% of sample). The probability of pretrial failure corresponds well with these six (6) combined risk levels. The first risk level (Low FTA/Low recidivism) has a recidivism probability of 4% and an FTA probability of 20%, while the highest combined risk level (High-2 on recidivism, regardless of FTA level) has a 60% recidivism probability and a 73% FTA probability (see Appendix F for entire range of pretrial failure probabilities). Appendix G further collapses the combined risk categories into three levels; however, the likelihood of pretrial failure is not very different between the moderate and high risk groups. As such, a three-category combined risk level is not recommended.

Predictive Validity by Sub-Groups

Release Type

The predictive validity of the FTA risk level and recidivism risk level was examined by pretrial release type for the entire pretrial release sample (n = 1066). As noted in Table 6 on page 14, 41% of the pretrial release sample was released from jail with no supervision conditions specified, 28% were released on financial conditions (e.g., bail, bond, cash, fine), 25% were released to CJS supervision, and 6% were released to another authority (e.g., AP&P, ICE).

When jail release type was added to a logistic regression predicting pretrial FTA, it was not significantly related to FTA after controlling for FTA risk level. A logistic regression for pretrial recidivism was also conducted, resulting in a similar finding. After controlling for recidivism risk level, there was not a significant relationship between jail release type and pretrial recidivism.

The distribution of FTA risk levels and probability of FTA within each release type is graphed in Appendix H. Releases to "other authority" were not included in Appendix H due to the small

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falsely flag more non-FTA and non-recidivist cases as FTA or recidivist, respectively. Output from the AUC-ROC allows an examination of the best location of cut-points depending on the goals of the instrument and the actual prevalence rates of the outcome. If increasing community safety is deemed most important, cut-points can be set at a lower value to prevent recidivism opportunity.

number of releases into that category. As shown in Appendix H, most people, regardless of jail release type, were FTA risk level one (1) or four (4), with increasing FTA risk scores typically in line with increasing probabilities of failing to appear for court across the three jail release categories.

Appendix I displays the distribution of recidivism risk levels and probability of recidivism within each release type. Most people, regardless of jail release type, were recidivism risk level one (1) or three (3). In general higher recidivism risk scores were associated with higher probabilities of recidivism; however, for some groups with extremely small samples (i.e., financial releases in risk level 7 had only 5 individuals) the trend did not hold.

Court Case Types

The predictive validity of the FTA risk level and recidivism risk level was also examined by the types of court cases individuals had upon their release from the jail (for all 1066 pretrial releases). As noted in Table 6 on page 14, 29% of the pretrial release sample had only District Court case(s) at their release, 51% had only Justice Court case(s), and 20% had both District and Justice Court cases at their release. Bivariate analyses showed that pretrial failure varies by the type of court case(s) a defendant has at their release (see Appendix A). As shown in Table 18, below, both FTA and recidivism were highest among those who had both District and Justice Court cases at their release. However, individuals with both District and Justice cases also had the longest average time until all of their cases were closed (also shown in Table 18); as such, they would have a longer follow-up time to accrue pretrial failure.

Table 18 Pretrial Failure by Court Case Type at Release for Pretrial Release Sample (n = 1066)

	FTA (%)	Recidivism (%)	Days to Final Case Closure (Md (SD))
Court Cases at Release			
District Case(s) Only	37	12	142 (125)
Justice Case(s) Only	45	13	174 (132)
Both District & Justice Cases	63	25	186 (136)

A logistic regression was conducted to look at the relationship between length of time to case closure and court case types at release with likelihood of FTA, after controlling for the FTA risk level. The length of time to case closure was statistically significantly related to likelihood of failing to appear, even after controlling for the significant impact of FTA risk level. This finding is not surprising, as having a longer opportunity for failure is often related to more failure. After controlling for both FTA risk level and length of time to case closure, court case type was not statistically significantly related to likelihood of FTA. This suggests that it is not the court case type that influences likelihood of FTA, but rather the speed of processing of court cases that is different between Justice and District cases.

A logistic regression was also conducted to look at the relationship between length of time to case closure and court case types at release with likelihood of recidivism, after controlling for the recidivism risk level. Again in this model, length of time to case closure was statistically significantly related to likelihood of recidivism, even after controlling for the significant impact of recidivism risk level. However, in this model, court case type was also significantly related to increased likelihood of recidivism, even after controlling for recidivism risk level and time to case closure. In this finding, individuals who had both District and Justice court cases at their release

were more likely to commit new crimes during the pretrial release period than those who had only District cases or only Justice cases. This suggests that the type of offender who is released with ongoing cases in both jurisdictions may be the type of offender who is more actively involved in multiple levels of criminal behavior and, therefore, more likely to continue in that pattern of offending in the short-term. Again, it should be noted that the importance of this factor was in addition to the significant relationships between recidivism risk score and time to case closure with recidivism.

Non-Released Sample

From the original sample of 1,456 jail bookings with pretrial release screenings, there were 390 bookings that did not have any court case hearings after the individuals were released from jail and, as such, could not be included in the development and validation of the pretrial release instrument (resulting in the 1,066 that were in those samples). However, after the FTA and recidivism risk levels were created, they were calculated for this non-released sample to determine if they had different risk score distributions than the pretrial release group. As previously noted in the Methods section, the 390 who did not have hearings after their jail release were those who were more likely to be in the jail on a commitment, warrant, or hold; less likely to have new charges at that booking, but have more severe offenses when they did have new charges.

As shown in Table 19, this non-released sample did score noticeably higher on the FTA risk level, with a higher proportion of this sample having scores of six (6) or seven (7). This indicates that perhaps some individuals in this group were not released pretrial due to jail screeners and judges having some information about them that indicated that they were at increased risk for pretrial failure. On the other hand, as shown in Table 19, there are a substantial proportion of individuals in this non-released sample who are low to moderate on the FTA and recidivism risk levels; as such, these individuals may be good candidates for pretrial release, based on the low probability of pretrial failure for individuals who have these scores on the pretrial release instrument.

Table 19 FTA and Recidivism Risk Level for Non-Released Sample Compared to Pretrial Release Sample

	Pretrial Release Sample		Non-Released Sample
	Developmental	Validation	
Sample by FTA Risk Levels (%)			
1	33	35	7
2	4	2	5
3	3	4	1
4	35	34	39
5	3	3	1
6	10	10	22
7	12	13	25
Sample by Recidivism Risk Levels (%)			
1	43	41	25
2	8	9	10
3	18	19	12
4	8	8	13
5	7	8	7
6	12	11	25
7	4	3	8

As shown in Table 20, 3% of the non-released sample would score "low" on both the FTA and recidivism risk levels, while an additional 25% would score low-moderate on both. It is expected that these groups would demonstrate similar pretrial failure rates as those who are already released at these risk levels. Of course, additional validation with larger released samples is recommended. Although pretrial FTA and recidivism could not be tracked for this group, recidivism at 90 days post-release was examined. The general trend between increasing recidivism risk scores and increasing probability of short-term recidivism was observed (from recidivism risk scores 1-7, 90-day recidivism was 6%, 13%, 2%, 10%, 12,%, 14%, 32%).

Table 20 Non-Released Sample by FTA and Recidivism Risk Levels

<table>
<tr><td colspan="2"></td><td colspan="7">FTA Risk Levels</td></tr>
<tr><td colspan="2"></td><td>Low</td><td colspan="4">Moderate</td><td colspan="2">High</td></tr>
<tr><td colspan="2">Recidivism Risk Levels</td><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td></tr>
<tr><td>Low</td><td>1</td><td>3%</td><td colspan="5" rowspan="2">25%</td><td colspan="2" rowspan="2">18%</td></tr>
<tr><td rowspan="2">Moderate</td><td>2</td></tr>
<tr><td>3</td><td colspan="5">25%</td><td colspan="2">18%</td></tr>
<tr><td rowspan="3">High</td><td>4</td><td colspan="5" rowspan="3">20%</td><td colspan="2" rowspan="3">25%</td></tr>
<tr><td>5</td></tr>
<tr><td>6</td></tr>
<tr><td>High-2</td><td>7</td><td colspan="7">8%</td></tr>
</table>

Discussion

The purpose of a pretrial risk assessment is to predict the likelihood of not showing up for court and/or committing a new offense during the pretrial period. The development of pretrial risk tools has come a long way and recently there has been a growing national movement to improve pretrial release supervision and risk assessments (Mamalian, 2011). Research and experts recommend using locally validated, objective instruments (Bechtel et al., 2011; Gottfredson & Moriarty, 2006; Mamalian, 2011). As such, the current study was undertaken to examine the relationship between pretrial failure and a variety of self-reported and official factors for a sample of defendants released from the Salt Lake County jail. Official statewide criminal history factors (BCI; e.g., lifetime and two-year arrests, convictions, person offenses, etc.) were examined in relation to pretrial failure; however, only lifetime prior arrests were included as a possible predictor in the proposed Pretrial Release Instrument (PRI). This decision was made based on the complexity of BCI rap sheets and the likelihood that collecting more detailed elements from BCI rap sheets would be too time-consuming and potentially inaccurate.

The result of this study is a proposed PRI, consisting of seven (7) items, that gives two risk scores (one for FTA and one for pretrial recidivism), each ranging from one (lowest risk) to seven (highest risk). Both risk scores had acceptable discriminant validity on both the developmental and validation samples and performed better than chance (based on AUC-ROC analyses). Those in the lowest risk group on the FTA risk score had less than a 30% chance of failing to appear in court, compared to the 49% base rate, while those in the highest risk group had a greater than 60% chance of FTA. Similarly, the lowest scoring group on the recidivism risk score had a 5% probability of recidivism, compared to the 15% base rate. Although higher risk scores were associated with higher probabilities of pretrial failure, a substantial proportion of the higher risk groups *do not* exhibit pretrial failure. For example, over 60% of individuals scoring 5-6 on the recidivism risk

score do not recidivate. Similarly, probability of FTA is around the overall sample average of 50% for those who score 3-5 on the FTA risk score. It is worth reiterating that pretrial risk scores are not a prediction for a specific individual, but rather a statistical probability of pretrial failure for *all* individuals with that score. As such, there will be some people in the lowest risk groups who do exhibit pretrial failure, while some in even the highest risk groups will not. Prediction of risk is difficult with low occurrence events (e.g., pretrial recidivism) (Gottfredson & Moriarty, 2006).

The proposed PRI was based on a sample of individuals who were released from the Salt Lake County jail pretrial and performed relatively well across sub-groups by gender, minority status, and release type (e.g., no conditions, financial conditions, supervision). A small non-released sample was also examined and it was determined that a substantial proportion of them scored low to moderate on the FTA risk score (53%), while 47% scored low to moderate on the recidivism risk score. As such, use of the proposed PRI may lead to more individuals qualifying for pretrial release.

The implementation of the proposed PRI may lead to a change in the type or number of defendants who are released pretrial. This may result in a greater variety of individuals who are released and, consequently, the potential for additional risk factors to be identified. Furthermore, it may result in changes in expected probabilities of pretrial failure by risk levels. The "true" base rate for pretrial failure cannot be known, as changes in release policies and supervision criteria result in selection bias (Gottfredson & Moriarity, 2006).[10] It is recommended that Salt Lake County revalidate the new PRI and further examine its discriminant validity for sub-groups (e.g., gender, minority, release types) with this larger released population. The Pretrial Justice Institute also recommends that risk assessments not only be piloted and validated for the specific jurisdiction using them, but that they are also revalidated on a regular basis to ensure that they continue to retain their predictive validity (Clark, n.d.).

[10] Gottfredson and Moriarity (2006) note the difficulty of predicting offender risk as risk instruments/models are created and validated from existing samples that do not have equal likelihood of being included. For example, not all offenders are released pretrial, nor are all of them randomly assigned to various conditions that may impact failure (e.g., supervision vs. own recognizance). As such, understanding the "true" failure rate is difficult.

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*Indicates that the study was included in the fourteen used to compare standard pretrial risk assessment items and guide additional items tested for inclusion in the pretrial release instrument (PRI) in this study

Appendix A Factors Related to Pretrial Failure in Bivariate Analyses

		90 days Post-Release		Through Case Closure	
Domain	Variable Description	FTA	Recidivism	FTA	Recidivism
Current Charge(s)					
	# of New Charge(s) at QB [13]			**	
	Max Severity of New Charge(s)				
	New Charge Type: (Y/N)				
	Person [13]	***		***	*
	Property		***		***
	Drug				*
	DUI[13]	***	**	***	**
	Traffic[13]		**		
	Obstructing LE	**		**	
	Obstruct Justice				
	Escape from Custody				
	Public Order				
	Commercial Sex				
	Weapon		*		
	Other Charge				
	New Charge Flag: (Y/N)				
	Violence[13]	***		***	
	Domestic Violence[13]	**		*	
	Sex				
	Liquor				
Current Non-Compliance					
	# of Holds at QB[13]		***		
	# of Warrants at QB	***		***	
	Pending Charges at QB (Y/N)			*	
	Current Supervision: (Y/N)[5]				
	AP&P Parole				
	AP&P Probation				
	County Probation				
	Pretrial Supervision				
	Other Supervision		*		
	None				
	Pre-Sentence report ordered (Y/N)[5]				
Criminal History – 2 years pre-QB					
Arrests[1]	# of prior arrest episodes		***	***	***
	# of prior misdemeanor arrests[2]	***	***	***	***
	# of prior felony arrests	**	***		***
	Offense type: (Y/N)				
	Person				
	Violent				
	Sex				

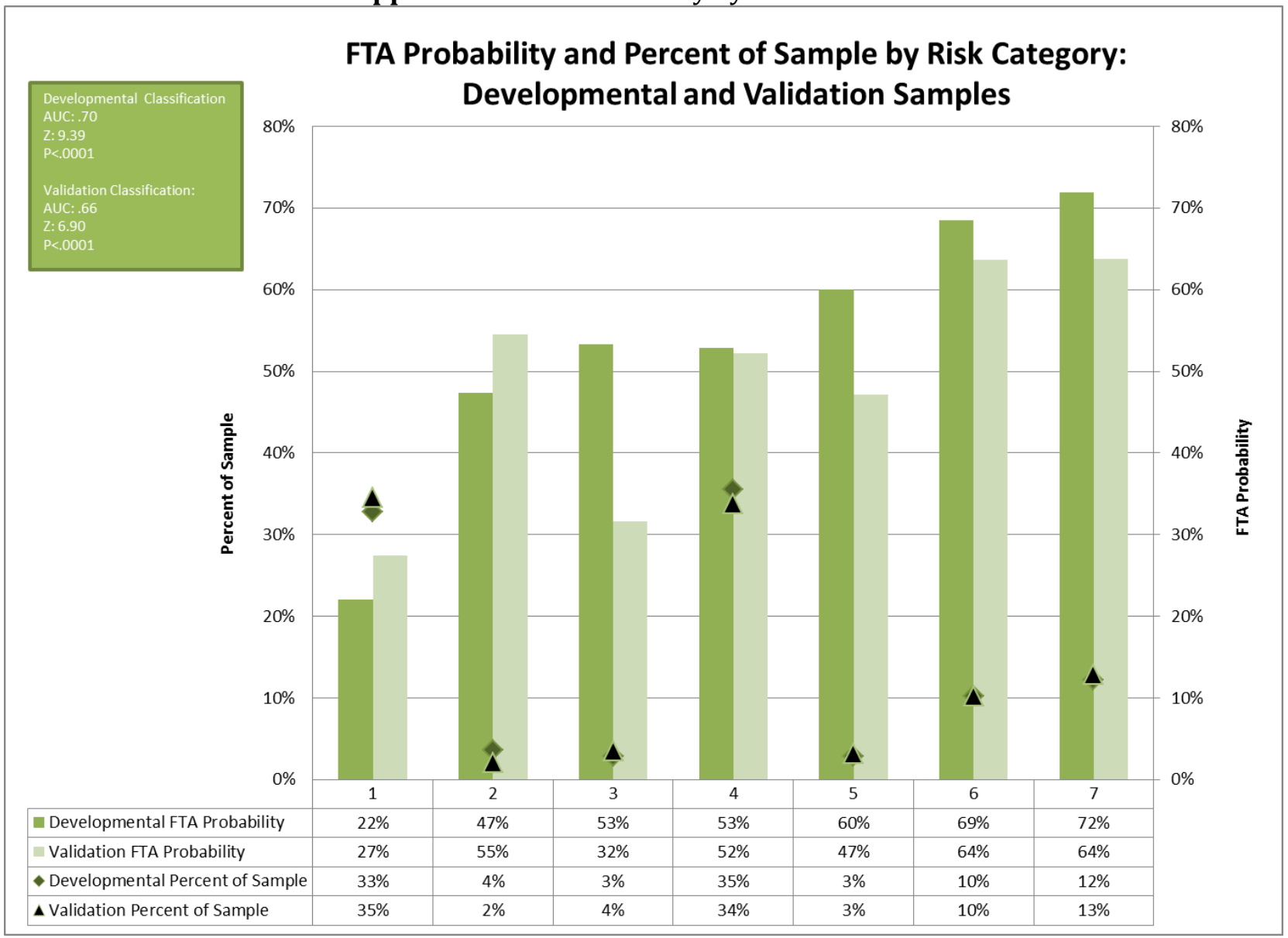
		90 days Post-Release		Through Case Closure	
Domain	Variable Description	FTA	Recidivism	FTA	Recidivism
	Prostitution				
	Weapon		*		
	Property	***	***	**	***
	Drug	*	***	**	***
	DUI				
	Liquor	***	***	**	***
	Traffic				
	Other	*	***	**	***
Jail Bookings	# of Bookings	***	*	***	***
	# of Commitment Bookings				**
	# of Hold Bookings				
	# of New Charge Bookings	***	*	***	***
	Max Charge Severity				
	Offense Type: (Y/N)				
	Person		*		**
	Property	**	*	**	**
	Drug			*	
	DUI				
	Traffic				
	Obstructing LE	**		**	*
	Obstruct Justice				
	Escape from Custody				
	Public Order	**		**	*
	Commercial Sex				
	Weapon				
	Other Charge				
	New Charge Flag: (Y/N)				
	Violence		*		**
	Domestic Violence				
	Sex				
	Liquor	**		**	**
Criminal History – Lifetime					
Arrests[1]	# of prior arrest episodes	***	***	***	***
	# of prior misdemeanor arrests[2]	***	***	***	***
	# of prior felony arrests		***	**	***
	# of arrests for offense type:				
	Person		***	**	***
	Violent	*	***	**	***
	Sex				
	Prostitution				**
	Weapon		***		**
	Property	***	***	***	***
	Drug	*	***	*	***

		90 days Post-Release		Through Case Closure	
Domain	Variable Description	FTA	Recidivism	FTA	Recidivism
	DUI				
	Traffic		**		
	Other	*	***	**	***
Convictions	Age at 1st conviction[3 5]		**		
	# of prior convictions	*	***	**	***
	# of misdemeanor convictions[4]	*	***	**	***
	# of person misdemeanor conv.		*	*	*
	# of non-person misdemeanor conv.		***	**	***
	# of felony convictions	*	**	*	***
	# of person felony conv.				
	# of non-person felony conv.	**		*	***
Non-Compliance History - 2 years pre-QB					
	# Warrant Bookings	***	*	***	***
	# of FTAs[5]	***		***	
Current Stability[5]					
	Employed[13]		*		*
	# of years at employment status	*			
	Unemployed	*			*
	Current Living Situation[6]				*
	# of years in Current Residence				*
	Housing Stability[7]				
	# of years in Salt Lake County				
Substance Abuse and Mental Health					
Substance Abuse (SA)	Current offense alcohol-related[13]	*	*	**	**
	Current offense drug-related				**
	History of Drug Use (Y/N)[5]	**		**	**
	Drug Use last 30 days (Y/N)[5]				
	SA problem (Y/N)[5]	**		**	**
	Combined Drug History (Y/N)[5 8]				**
	No History of SA Treatment (Y/N)[5 13]		***		**
	Previous SA Treatment (Y/N)[5]		**		**
	Currently in SA Treatment (Y/N)[5]				
	Benefit from SA Treatment (Y/N)[5]	*		*	**
Mental Health (MH)	Previous MH Treatment (Y/N)[5]				
	Currently in MH Treatment (Y/N)[5]				
	Current suicidal thoughts[5]				
Demographics at QB					
	Age				
	Marital Status[5]				
	Current offense has victim[9 13]	**		*	
	Attempts to contact reference(s):				
	Successful		*		
	Residence verified				

		90 days Post-Release		Through Case Closure	
Domain	Variable Description	FTA	Recidivism	FTA	Recidivism
Other					
	Employment verified				
	Unsuccessful				
	No attempt(s) made		**		
	Client appeared:[10]				
	Stable				
	Cooperative				
	Other				
	Release Type[11]				
	Court Case(s) at Release[12]	***		***	
	Time to maximum case closure			***	***

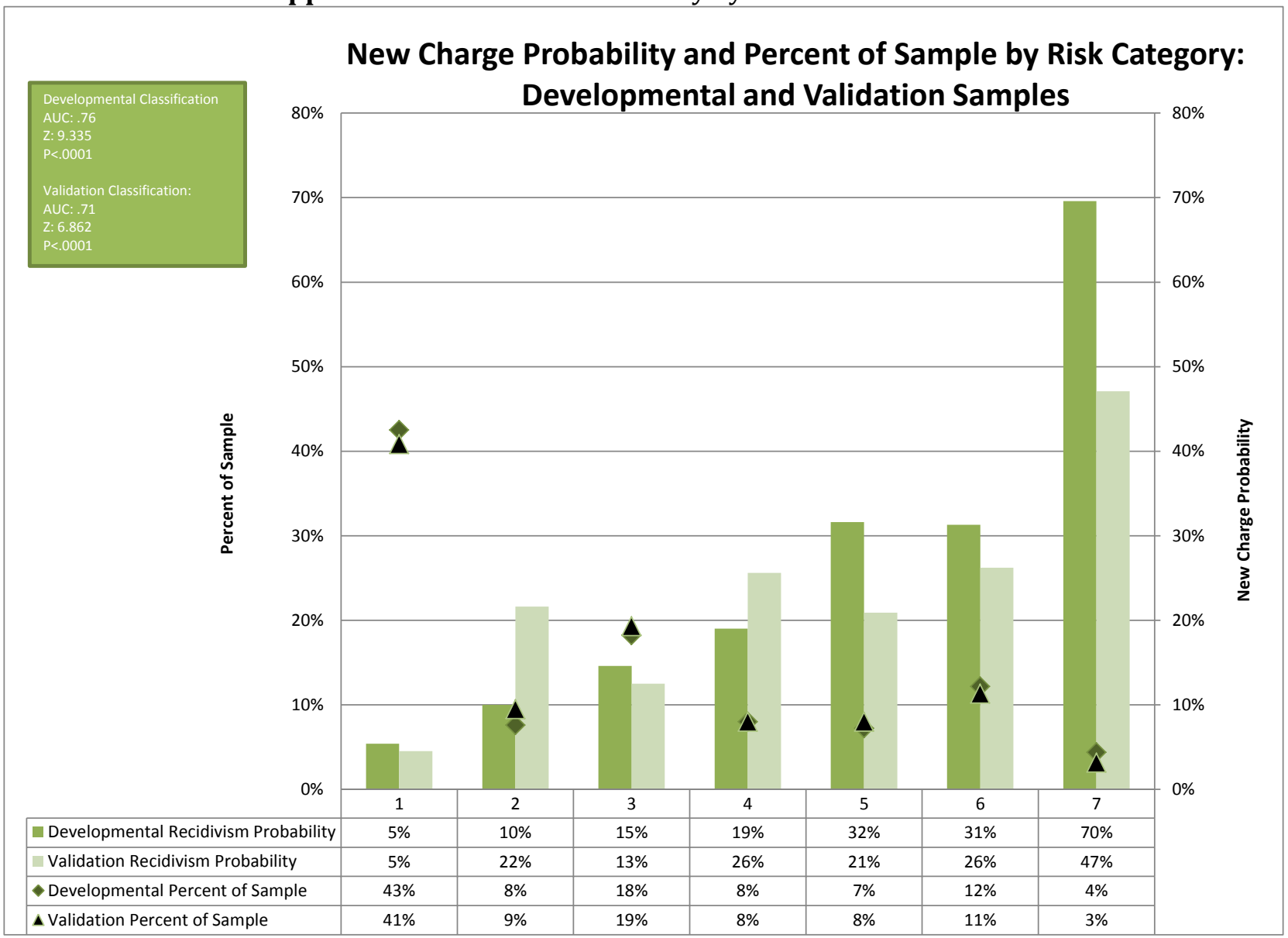
*p <= .05
**p <= .01
***p <= .001
[1] An arrest in the BCI record could indicate new charge(s) or an arrest on an outstanding warrant
[2] Misdemeanor arrest episodes are those where the most serious offense on the arrest date was a misdemeanor
[3] Only for those with any prior convictions
[4] Misdemeanor convictions are those where the most serious offense on the OTN was a misdemeanor
[5] Self-reported
[6] 3 categories: Permanent Housing, Temporary Housing, Homeless
[7] Combined variable from pilot items #13 (living situation) and #14 (current residence)
[8] Combined variable from pilot items #19 (current offense drug-related) and #20 (self-reported history of drug use)
[9] Only for person offenses
[10] Based on pretrial jail screener's perception and observations
[11] 4 categories: No Conditions Specified, Bail/Bond/Cash/Fine, CJS Supervision, Other Authority
[12] 3 categories: District case(s) only, Justice case(s) only, Justice and District cases
[13] Factor decreases likelihood of pretrial failure

Appendix B FTA Probability by FTA Risk Level



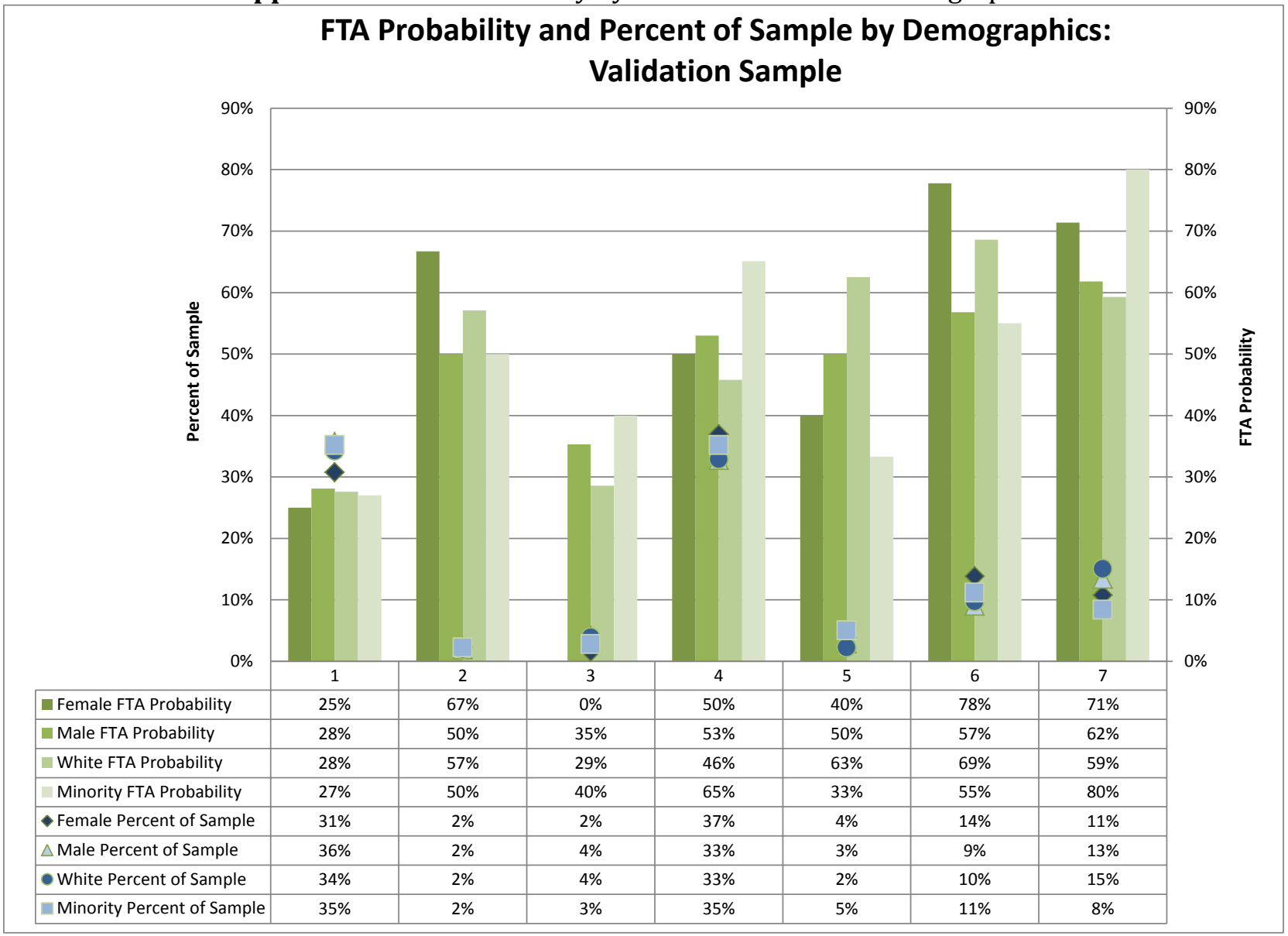
	1	2	3	4	5	6	7
Developmental FTA Probability	22%	47%	53%	53%	60%	69%	72%
Validation FTA Probability	27%	55%	32%	52%	47%	64%	64%
Developmental Percent of Sample	33%	4%	3%	35%	3%	10%	12%
Validation Percent of Sample	35%	2%	4%	34%	3%	10%	13%

Appendix C Recidivism Probability by Recidivism Risk Level



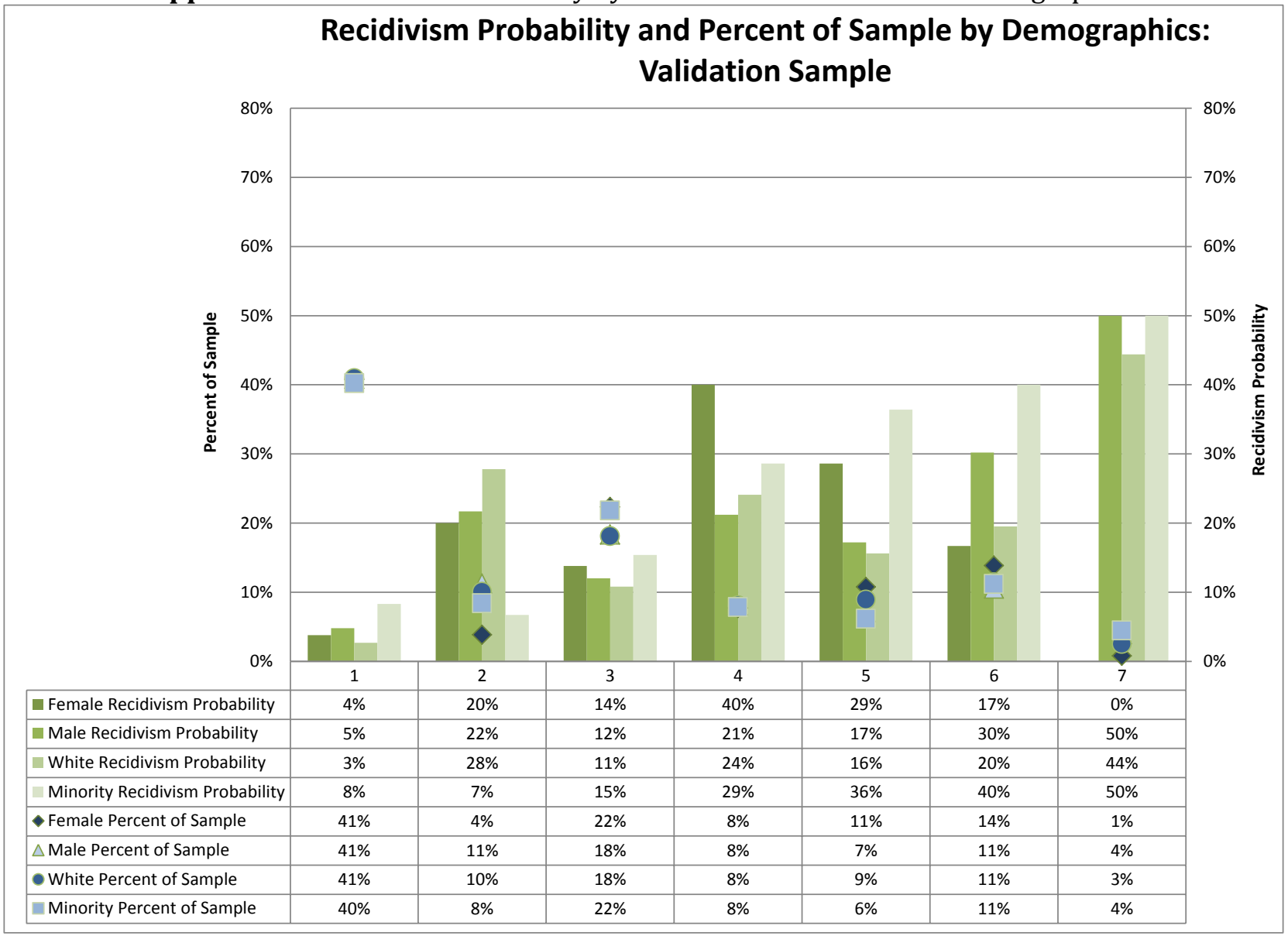
	1	2	3	4	5	6	7
Developmental Recidivism Probability	5%	10%	15%	19%	32%	31%	70%
Validation Recidivism Probability	5%	22%	13%	26%	21%	26%	47%
Developmental Percent of Sample	43%	8%	18%	8%	7%	12%	4%
Validation Percent of Sample	41%	9%	19%	8%	8%	11%	3%

Appendix D FTA Probability by FTA Risk Level and Demographics



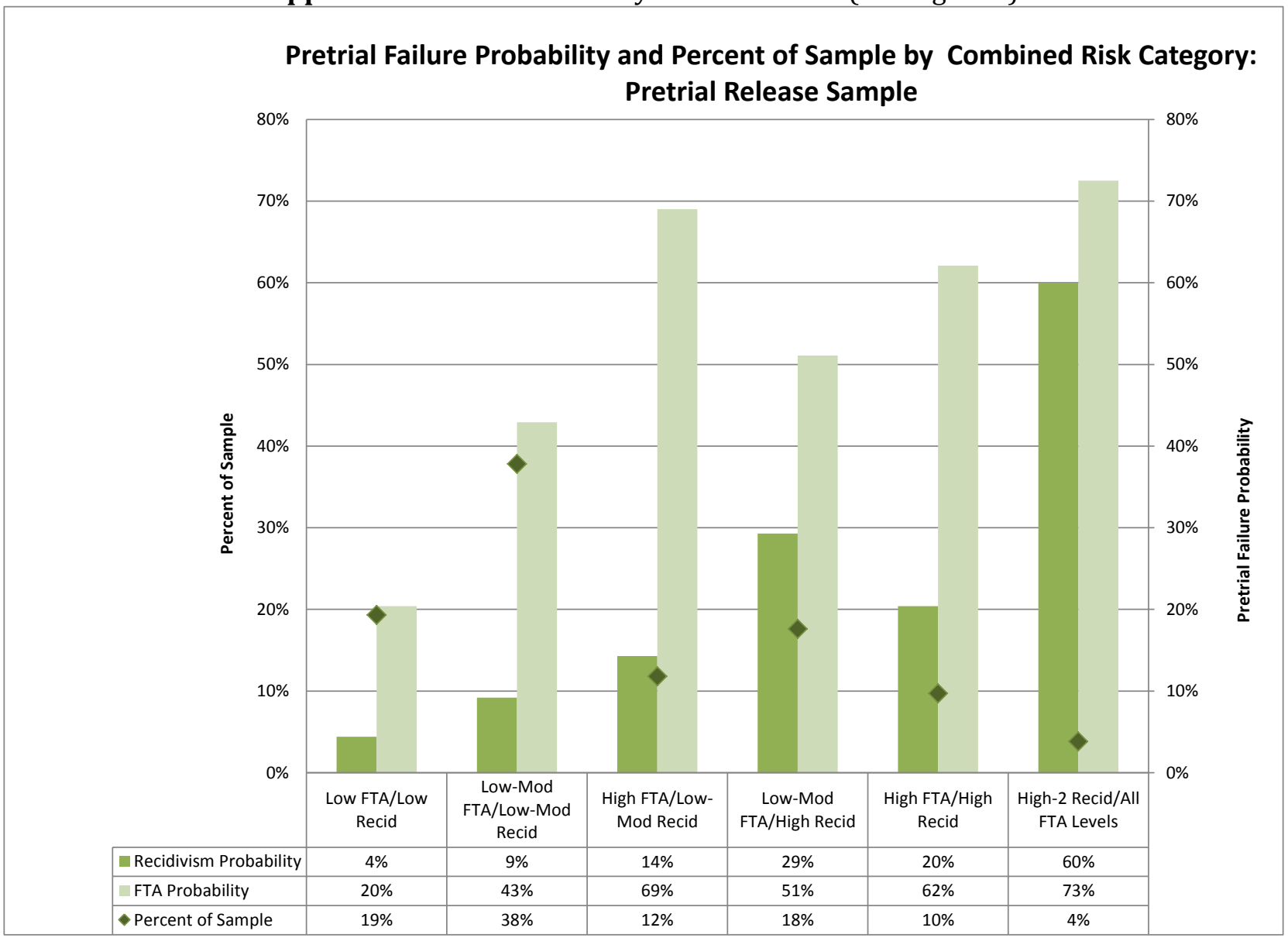
	1	2	3	4	5	6	7
Female FTA Probability	25%	67%	0%	50%	40%	78%	71%
Male FTA Probability	28%	50%	35%	53%	50%	57%	62%
White FTA Probability	28%	57%	29%	46%	63%	69%	59%
Minority FTA Probability	27%	50%	40%	65%	33%	55%	80%
Female Percent of Sample	31%	2%	2%	37%	4%	14%	11%
Male Percent of Sample	36%	2%	4%	33%	3%	9%	13%
White Percent of Sample	34%	2%	4%	33%	2%	10%	15%
Minority Percent of Sample	35%	2%	3%	35%	5%	11%	8%

Appendix E Recidivism Probability by Recidivism Risk Level and Demographics



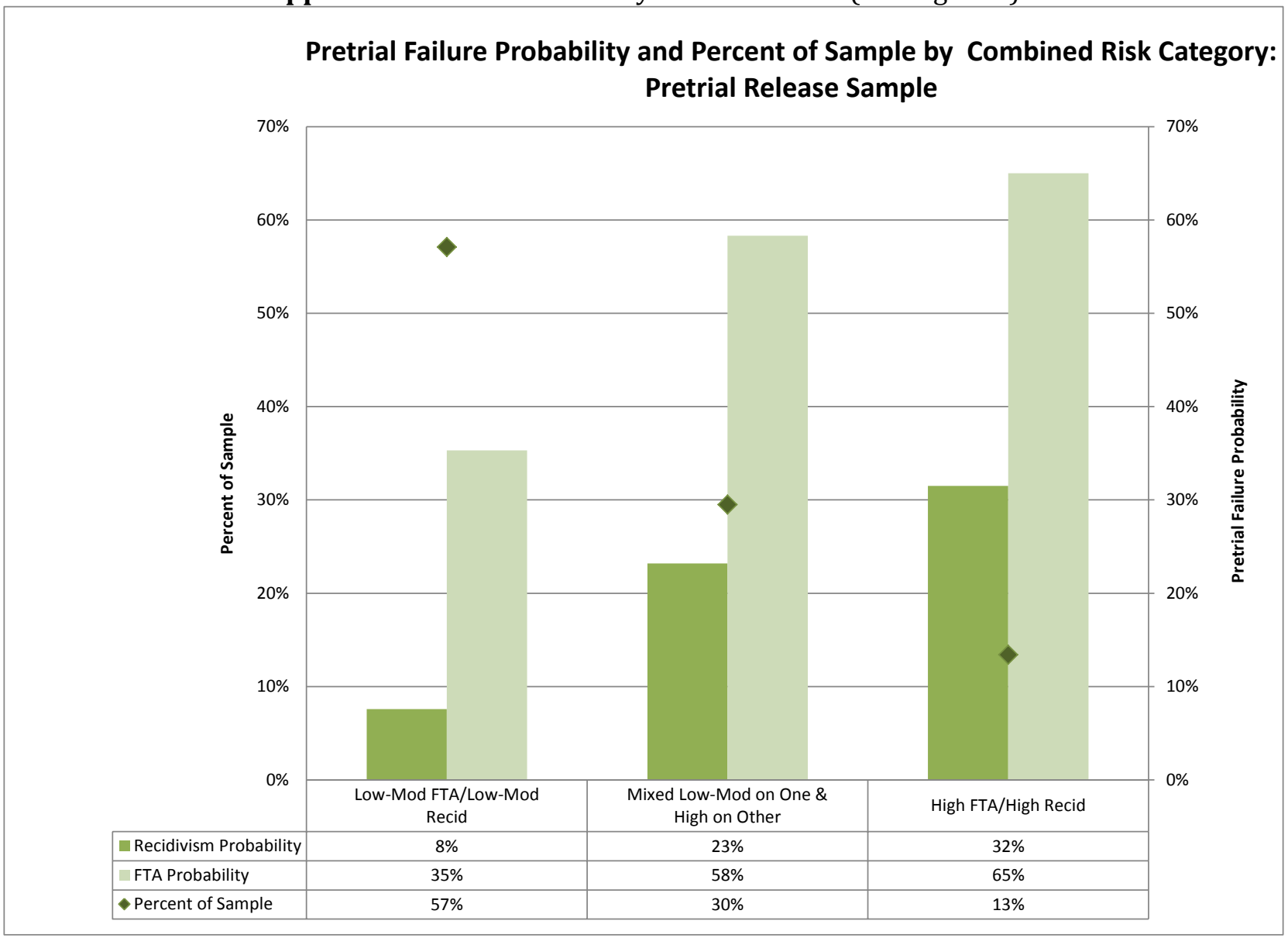
	1	2	3	4	5	6	7
Female Recidivism Probability	4%	20%	14%	40%	29%	17%	0%
Male Recidivism Probability	5%	22%	12%	21%	17%	30%	50%
White Recidivism Probability	3%	28%	11%	24%	16%	20%	44%
Minority Recidivism Probability	8%	7%	15%	29%	36%	40%	50%
Female Percent of Sample	41%	4%	22%	8%	11%	14%	1%
Male Percent of Sample	41%	11%	18%	8%	7%	11%	4%
White Percent of Sample	41%	10%	18%	8%	9%	11%	3%
Minority Percent of Sample	40%	8%	22%	8%	6%	11%	4%

Appendix F Pretrial Failure by Combined Risk (6 categories)

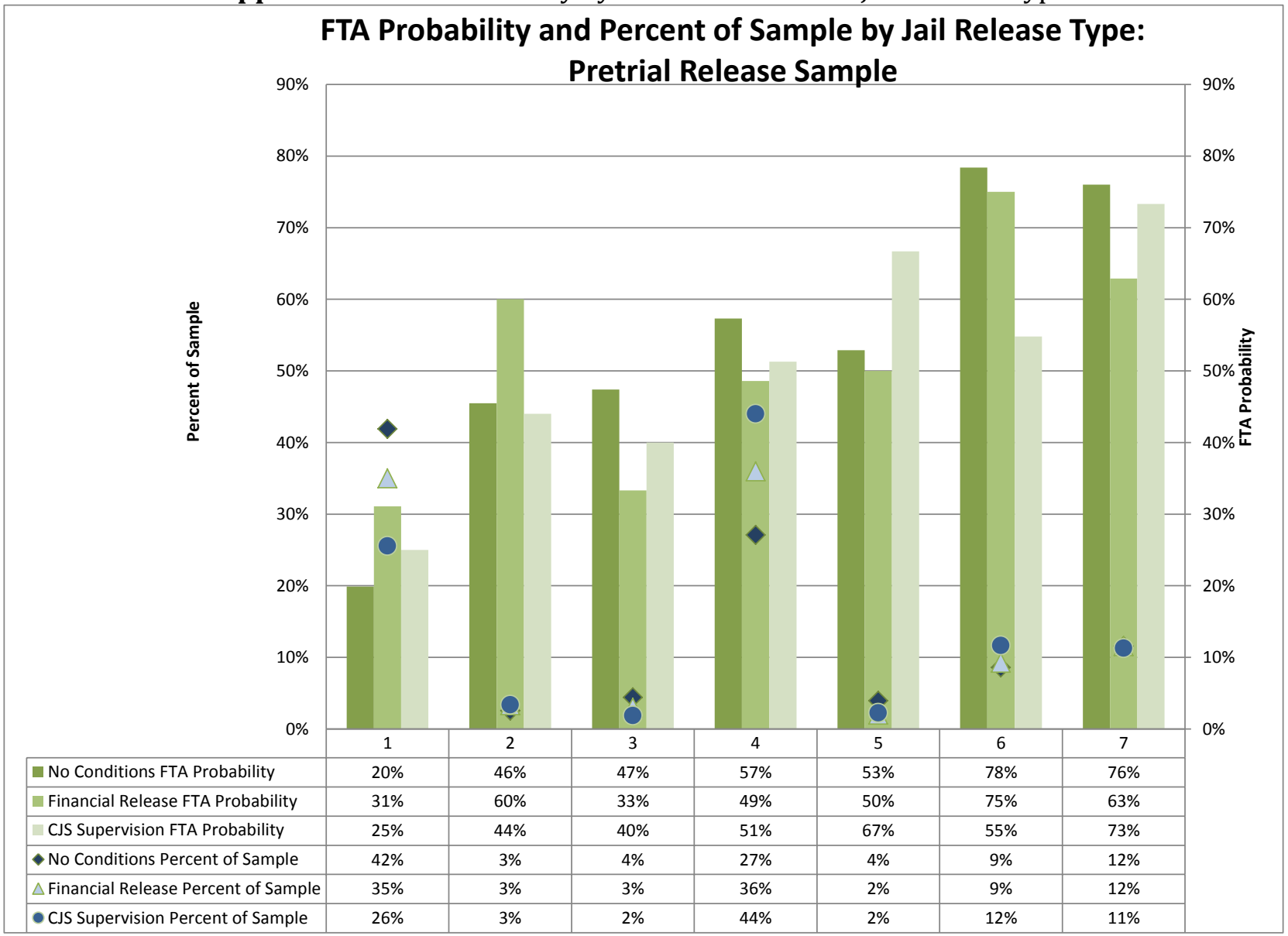


	Low FTA/Low Recid	Low-Mod FTA/Low-Mod Recid	High FTA/Low-Mod Recid	Low-Mod FTA/High Recid	High FTA/High Recid	High-2 Recid/All FTA Levels
Recidivism Probability	4%	9%	14%	29%	20%	60%
FTA Probability	20%	43%	69%	51%	62%	73%
Percent of Sample	19%	38%	12%	18%	10%	4%

Appendix G Pretrial Failure by Combined Risk (3 categories)

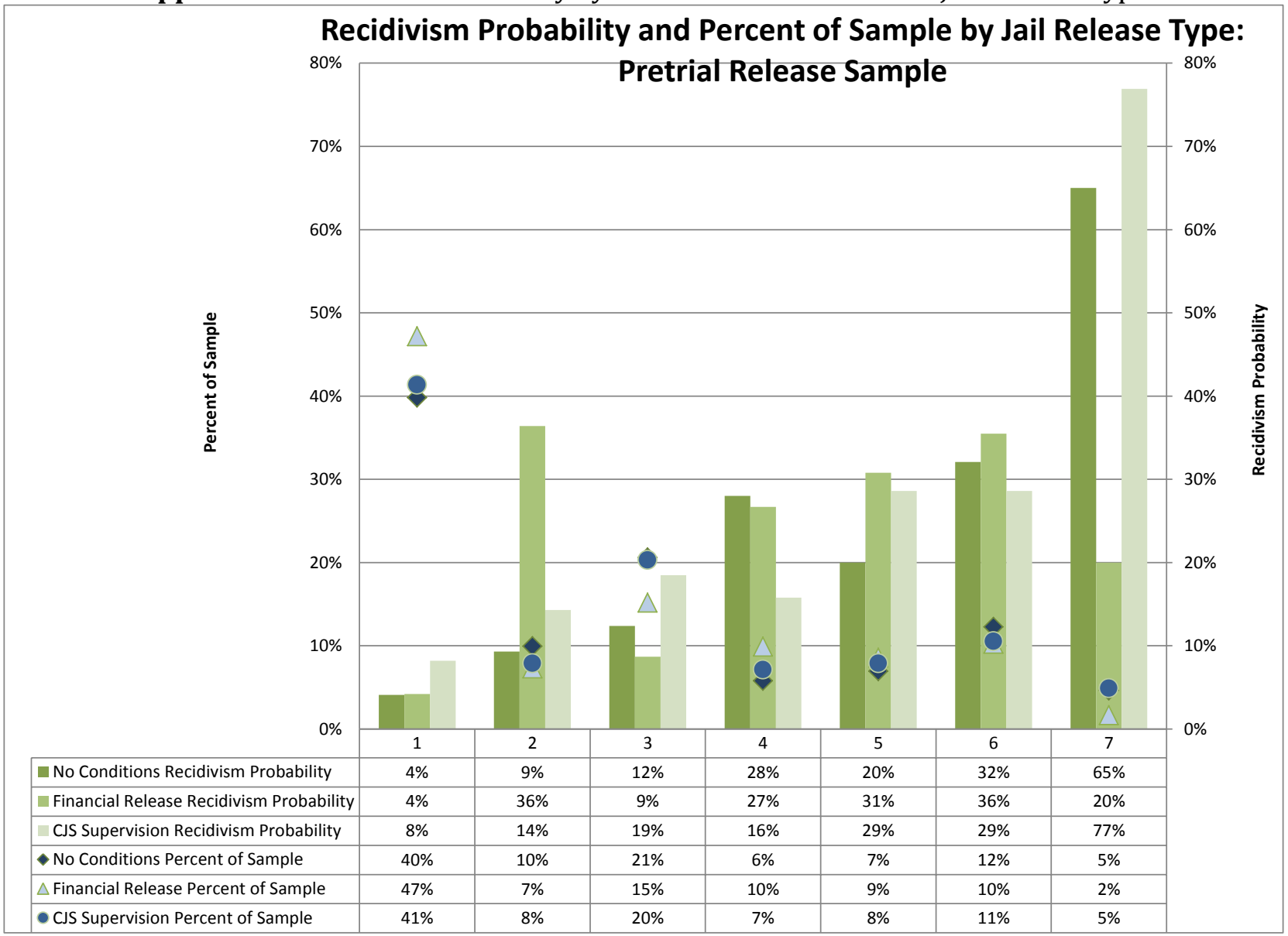


Appendix H FTA Probability by FTA Risk Level and Jail Release Type



	1	2	3	4	5	6	7
No Conditions FTA Probability	20%	46%	47%	57%	53%	78%	76%
Financial Release FTA Probability	31%	60%	33%	49%	50%	75%	63%
CJS Supervision FTA Probability	25%	44%	40%	51%	67%	55%	73%
No Conditions Percent of Sample	42%	3%	4%	27%	4%	9%	12%
Financial Release Percent of Sample	35%	3%	3%	36%	2%	9%	12%
CJS Supervision Percent of Sample	26%	3%	2%	44%	2%	12%	11%

Appendix I Recidivism Probability by Recidivism Risk Level and Jail Release Type



	1	2	3	4	5	6	7
No Conditions Recidivism Probability	4%	9%	12%	28%	20%	32%	65%
Financial Release Recidivism Probability	4%	36%	9%	27%	31%	36%	20%
CJS Supervision Recidivism Probability	8%	14%	19%	16%	29%	29%	77%
No Conditions Percent of Sample	40%	10%	21%	6%	7%	12%	5%
Financial Release Percent of Sample	47%	7%	15%	10%	9%	10%	2%
CJS Supervision Percent of Sample	41%	8%	20%	7%	8%	11%	5%