STARKE COUNTY: IRAS-PAT VALIDATION

FINAL REPORT

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INTRODUCTION

Pretrial decision-making involves timely choices by judges with limited information and variable input from members of the courtroom workgroup (DeMichele et al., 2018). It is well established that the decisions made at this phase of justice system have implications for subsequent outcomes. Defendants incarcerated pending trial are more likely to plead guilty, receive lengthier sentences, and subsequently recidivate more often in relation to defendants released prior to court disposition (Stevenson & Mayson, 2017). Incarceration can also disrupt housing, employment, family relationships, and ties to the community (Stevenson & Mayson, 2017). Pretrial risk assessments have emerged as one strategy to structure and improve pretrial decision-making. The integration of these assessment tools also comes at a time when reforms to reduce the use of monetary bond schedules are being advanced across the country (Stevenson, 2018).

Pretrial risk assessment tools are not without controversy. The primary set of criticisms about these tools concern whether they are able to predict pretrial misconduct, differentiate the likelihood or frequency of misconduct by risk level, and minimize the potential effect of racial, ethnic, and gender biases while maintaining comparable rates or reducing the risk of pretrial misconduct. Much of the evidence for or against the utility of pretrial risk assessment tools is based on theoretical claims; research evaluations have not kept pace with the volume of local implementations. Although studies have demonstrated the predictive validity of specific pretrial risk assessment tools (e.g., Austin, Bhati, et al., 2010; Austin, Ocker, et al., 2010; Cadigan & Lowenkamp, 2011; Latessa et al., 2010), questions remain about tools that have not been subject to validity tests, tools that have been constructed in one jurisdiction and integrated in another, the items used to score tools, the capacity to administer the tools, how the perceptions of courtroom workgroup professionals can influence the adoption of tools (DeMichele et al., 2018), and the effect of instrument adoption on rates of incarceration and pretrial misconduct (Stevenson, 2018).

Previously, researchers from the Indiana University Public Policy Institute, Center for Criminal Justice Research (CCJR) conducted a process evaluation of pilot counties to understand how the Indiana Risk Assessment System – Pretrial Assessment Tool (IRAS-PAT) was adopted by participating pilot counties. This foundational study also identified barriers and facilitators to implementation and explored relationships between IRAS-PAT items, risk categories, and bond or order for release outcomes (Grommon et al., 2017). The current inquiry moves to the second stage of research on the IRAS-PAT pilot program. This phase offers a county-by-county validation of the IRAS-PAT.

Other assessment tools in the IRAS suite – Community Supervision Tool (CST), Community Supervision Screening Tool (CSST), and Prison Reentry Tool (PRT) – were assessed in a sole Indiana validation study (Latessa et al., 2013). Overall, the findings confirmed that the IRAS-CST, IRAS-CSST, and IRAS-PRT are able to predict recidivism and the relative risk of recidivism varies by risk level. The predictive validity of the IRAS-PAT could not be assessed in this study due to the lack of requisite data (Latessa et al., 2013, p. 9).

Insights about the predictive validity of the IRAS-PAT can be deduced from the IRAS' predecessor, the Ohio Risk Assessment System (ORAS) and its Pretrial Assessment Tool (PAT).

The ORAS-PAT consists of seven items across four domains: criminal history (three items), employment (one item), residential stability (one item), and substance abuse (two items). ORAS-PAT assessments were validated in a sample of 452 defendants from seven Ohio counties and an average follow-up of 12 months (Latessa et al., 2009). Overall, 16% of defendants failed to appear or were rearrested. Risk score was positively and moderately associated with recidivism (r=0.23). Risk levels also followed a stepwise progression as 5% of Low risk defendants recidivated, while 18% of Moderate risk and 30% of High risk defendants recidivated. Similar stepwise patterns were observed within ORAS-PAT domains (although the associations between domains and recidivism outcomes were not as strong as those established in the test of relationship between risk score and recidivism, ranging in value from *r*=0.05 to *r*=0.19).

Preliminary predictive validity findings of IRAS-PAT assessments conducted in five Indiana counties were published in a prior report (Lowder et al., 2020). This study found the IRAS-PAT assessments produced good-to-excellent levels of predictive validity (AUCs = 0.67-0.72) for any FTA, any new arrest, and any arrest pretrial misconduct outcomes. In this pooled investigation, 4.3% of Low risk defendants, 12.9% of Moderate risk defendants, and 24.8% of High risk defendants had any FTA. Rates of any new arrest were 8.8%, 19.3%, and 31.9% for Low, Moderate, and High risk defendants, respectively. Findings overall showed strong levels of predictive validity for IRAS-PAT assessments conducted in practice.

To better understand the predictive validity of the IRAS-PAT, we report IRAS-PAT validation findings from **Starke County**. Prior to presenting the results, we describe the methods, procedures, and assumptions and conclude with a discussion of key findings.

METHODS

Study Context

Mirroring national trends, the state of Indiana reported the highest local incarceration rate of all midwestern states (330 per 100,000 residents) in 2013, representing a 15% increase over 1999 rates. Indiana's local jail capacity was among the highest for midwestern jurisdictions at year-end 2013 (83.2% capacity), second only to Ohio (Minton et al., 2015). Responding to these trends, the Indiana Supreme Court founded the Committee to Study Evidence-Based Pretrial Release to develop and evaluate evidence-based pretrial release practices. In 2014, the Committee developed a pilot program to examine implementation of the IRAS-PAT in 11 Indiana counties: Allen, Bartholomew, Grant, Hamilton, Hendricks, Jefferson, Monroe, Porter, St. Joseph, Starke, and Tipton. The purpose of the pilot project was to validate and evaluate the implementation of the IRAS-PAT in the 11 pilot counties, including the extent of its use and feasibility for use in other Indiana jurisdictions. The pilot program began between January 2016 and March 2017 in participating counties.

Data came from Starke County, located in the North of Indiana. The county seat is in Knox, and the County has a population of 22,952 (2019 estimate). Starke County commenced the pilot program in January 2016, originally targeting individuals booked on a felony offense. However, the county expanded IRAS-PAT assessments to all charge types in August, 2019. Individuals are assessed in the jail, most typically within 24 hours, but can be assessed up to 48 hours after an

initial jail admission.

The study period for the Starke County validation ran from January 1st, 2016 through December 31st, 2020. We elected to employ a longer study period due to the smaller volume of assessments conducted on an annual basis. The follow up period was defined by each defendant's pretrial processing period, which runs from jail release date to court disposition date. However, all defendants were required to have their case disposed by December 31st, 2021, which was the final date for follow-up data collection.

Data Sources

Data for this validation came from several databases. Starke County staff provided jail records with information on booking and release dates for individuals who were arrested during the study and follow up periods. We received pretrial data containing assessment information such as risk level, risk score, and item-level data from an Indiana statewide database, INcite. Finally, the statewide Odyssey Case Management System provided us with case-related information such as charge information, FTAs, filing dates, disposition dates, and case outcomes between January 2016 and December 2021.

Data Cleaning

Our data cleaning and linking was done primarily through R and RStudio (R Core Team, 2017). First, we created a unique ID based on identifiable information to link a Starke County assessment to a jail booking record. Individuals included in this step were assessed between booking and release dates. After identifying a booking record for each assessment, we linked these matched records to court case records to ensure we could track case outcomes. Upon consultation with local staff, we matched court case records with initial hearing dates occurring up to three days post-booking and filing dates occurring between three days prior to booking and seven days after release. We present the sample creation process in Figure 1. We identified 798 IRAS-PAT assessments conducted in Starke County between January 1st, 2016 and December 31st, 2020. We were able to match these assessments to 714 unique jail bookings. Of these 714 jail bookings, 456 cases were linked to a court case record based on criteria established above. Of these cases, 46 represented multiple cases for the same individual. After removing repeated admissions by the same individual, we additionally removed 107 individuals who either had no disposition date

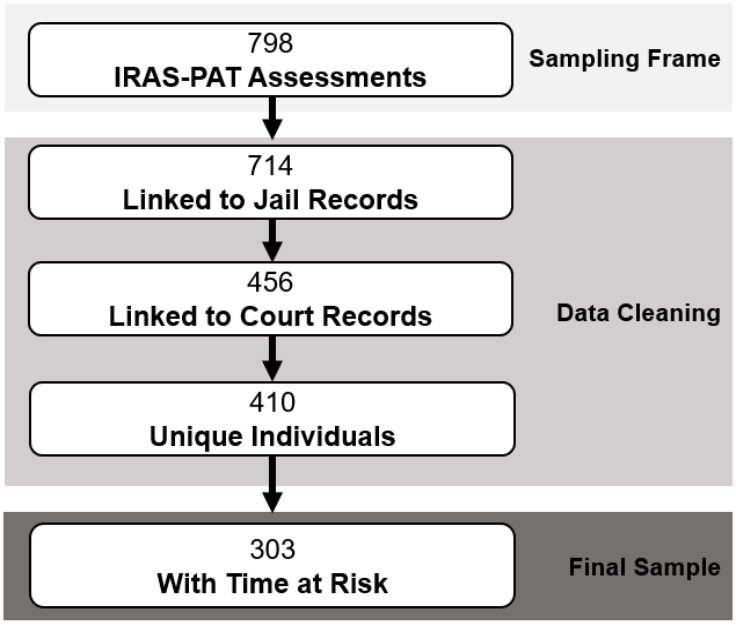

Figure 1. Data Cleaning Flowchart

or had no time in the community prior to case disposition. The final sample included 303 unique defendants who were booked into jail, assessed during the study period, and released into the community prior to court case disposition.

Sample

The final sample for Starke County consisted of 303 defendants on pretrial release with time at risk in the community. The average age at booking was 35.12 years old (*SD* = 11.00, Range: 18 to 62). Defendants were mostly male (*n* = 206, 68.0%; female: *n* = 97, 32.0%) and White (*n* = 291, 96.0%; Black: *n* = 3, 1.0%; Other: *n* = 9, 3.0%). On average, defendants were booked into jail on a charge level of 5.92, which corresponds to a felony level 6 offense. The most frequently occurring booking charges were for Drug (*n* = 168, 55.4%), Disorderly Conduct (*n* = 67, 22.1%) or Assault (*n* = 56, 18.5%) offenses. Because individuals could be booked on multiple charges, these charges are not mutually exclusive. Finally, defendants spent an average of 299.13 days in the community between release and case disposition (*SD* = 275.96, Range: 1 to 1,758).

Variables

IRAS-PAT. The IRAS-PAT is an actuarial assessment designed to predict risk of arrest and FTA during the pretrial period. The IRAS-PAT is a 7-item instrument measuring 1) age at first arrest, 2) number of FTA warrants in the past 24 months, 3) three or more prior jail incarcerations, 4) employment at the time of arrest, 5) residential stability, 6) illegal drug use in the past six months, and 7) a severe drug use problem. Items 1, 3, 5, 6, and 7 are scored dichotomously (i.e., 0 or 1) and items 2 and 4 are scored on a 0-2 point scale, producing a maximum total score of 9. Total scores classify defendants into three risk levels: Low (0-2), Moderate (3-5), and High (6+). Our investigation used IRAS-PAT *total scores*, *risk levels*, and *items.*

Pretrial misconduct outcomes. Pretrial misconduct outcomes were measured in the period between a defendant's release date and case disposition date. We measured three primary outcomes. *Any arrest* measured any booking occurring during the pretrial period. *Any new arrest* measured a new booking occurring during the pretrial period in which a detainee was booked on any new offense charge. *Any FTA* measured Failure to Appear at any court appearance during case processing. We recorded number of FTAs that occurred in between release and disposition dates, along with the date for the first FTA. In addition to these outcomes, we report descriptively on *any pretrial misconduct*, measured in two ways. First, we measured pretrial misconduct according to any arrest or FTA occurring during this period. Second, we measured pretrial misconduct according to any new arrest or FTA occurring during this period. Multivariable models additionally controlled for *time at risk*, defined as the number of days in the community, excluding jail time, between the release date and case disposition date. On average, defendants were at risk in the community for 266.89 days (*SD* = 274.47, Range: 1 to 1,758).

Analytic Strategy

We first conducted descriptive statistics on all study variables to assess response distributions. Then, we conducted crosstabulations of risk levels with pretrial misconduct outcomes to examine rates of misconduct at each risk level. Significant associations were tested using a chi-squared test of independence and effect size measured using Cramer's V. Cramer's V values of .10, .30, and .50 indicate small, medium, and large effect sizes, respectively (Cohen, 1988). Among defendants with arrests or any pretrial failure during the case processing period, we examined survival days (i.e., days from release to date of arrest or FTA) by risk level.

To examine the predictive validity of IRAS-PAT assessments, we used a multi-pronged approach. First, we examined the Area Under the Curve (AUC) of the Receiving Operating Characteristic (ROC) curve statistics. AUC values are commonly used to evaluate the predictive accuracy of risk assessment total scores. AUC values range from .50 to 1, with .50 indicating chance levels of classification and 1 suggesting perfect classification. AUC values below .54 are typically considered poor, .55 to .63 fair, .64 to .70 good, and .71 and above excellent. These conventions have been documented in reports adopted by the Bureau of Justice Assistance, National Institute of Justice, and National Institute of Corrections and represent the benchmarks for predictive accuracy in the field of risk assessment (Desmarais & Singh, 2013). Second, we conducted a series of logistic regression analyses to examine the predictive validity of IRAS-PAT assessments for each pretrial misconduct outcome, controlling for time at risk. For reference, odds ratios of 1.50, 3.00, and 5.00 indicate small, medium, and large effect sizes, respectively (Chen et al., 2010). Third, we conducted survival analyses using cox proportional hazard models to examine predictive accuracy as a function of time to a specific outcome. Resulting hazard ratios (HR) produced by cox regression models are a numerical expression of a difference in the rate of an outcome occurring between two conditions. For inferential statistics, we used a $p<.05$ criterion to determine statistical significance.

RESULTS

Sample Descriptives

IRAS-PAT. IRAS-PAT scores averaged 3.92 (*SD* = 1.93, Range: 0 to 9) across defendants. This corresponds to a Moderate risk level. We present the frequency distribution of risk scores in Figure 2. As shown, the defendants were assessed at a relatively Moderate risk, with over half of the risk scores falling between a score of 3 and 5 (53.1%).

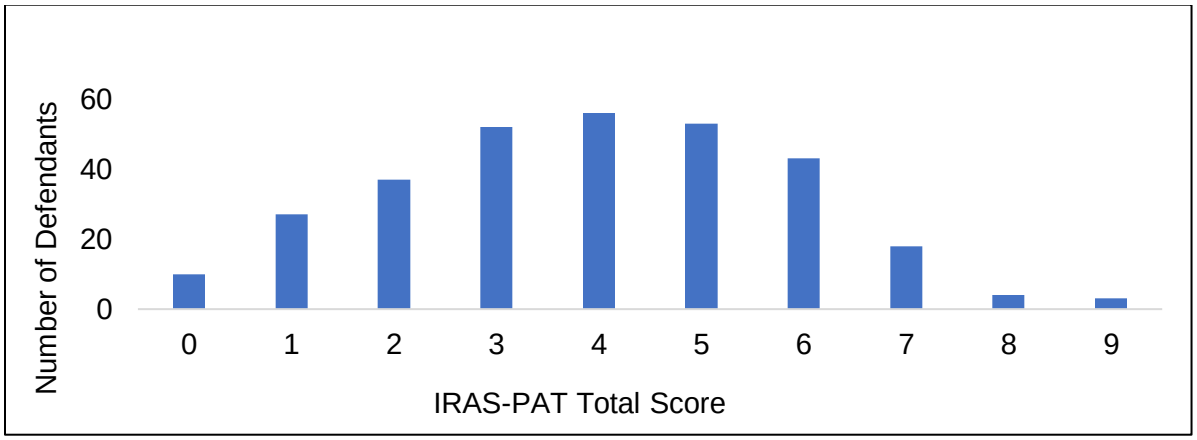

Figure 2. Frequency of IRAS-PAT Total Score

The distribution of defendants across risk levels is presented below in Figure 3. As shown, the majority of defendants were at Moderate risk (*n* = 161, 53.1%), followed by Low risk (*n* = 74, 24.4%) and High risk (*n* = 68, 22.4%).

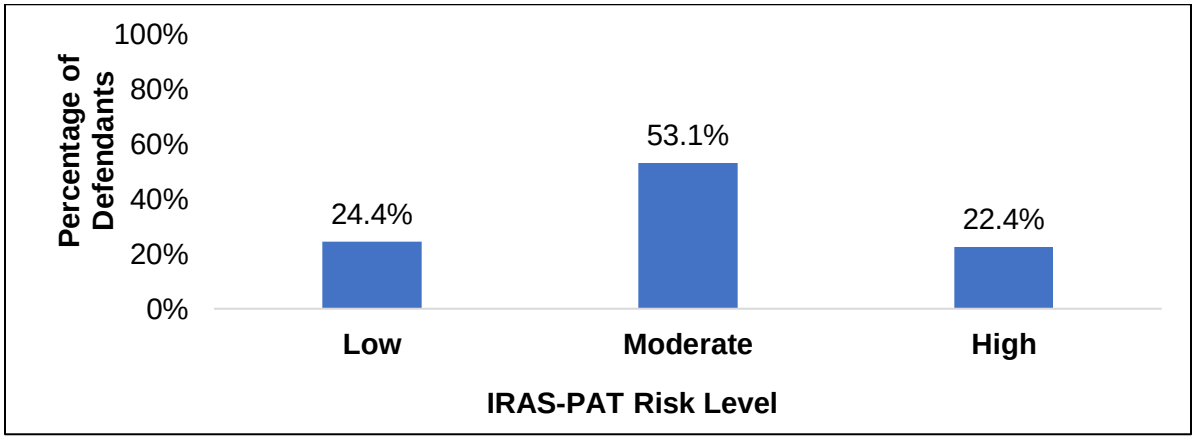

Figure 3. Frequency of IRAS-PAT Risk Level

Pretrial Misconduct Outcomes. Approximately 18.5% of the defendants (*n* = 56) failed to appear for any court hearing following release from jail but prior to case disposition. Additionally, about 20.1% of the defendants (*n* = 61) were arrested on a new charge between jail release and case disposition. A little under two-fifths of the sample had any pretrial misconduct however (including any new arrest), with 39.3% of the defendants being readmitted into jail for any reason (*n* = 119).

Crosstabulations of Risk Level and Pretrial Misconduct Outcomes

Table 1 presents a crosstabulation of risk level with pretrial misconduct outcomes. Rates of pretrial misconduct were lowest for Low risk defendants, and highest for defendants at High risk, across all pretrial outcomes. For individuals who had an FTA for any court hearing, Moderate risk defendants who were released into the community on average failed to appear sooner (*M* = 160.91 days, *SD* = 232.79) than High (*M* = 169.63 days, *SD* = 177.66) or Low risk defendants (*M* = 177.00 days, *SD* = 174.22). Among defendants booked into jail on a new offense between release and disposition, Low risk defendants were booked sooner (*M* = 149.63 days, *SD* = 126.22) than Moderate risk defendants (*M* = 196.85 days, *SD* = 220.91) and High risk defendants (*M* = 207.00 days, *SD* = 216.90). Low risk defendants were also arrested for any reason sooner (*M* = 89.95 days, *SD* = 61.68) than Moderate risk (*M* = 133.86 days, *SD* = 163.37) and High risk (*M* = 165.23 days, *SD* = 138.05). Among all defendants, the length of time between pretrial release and case disposition was not significantly associated with any FTA (*r*[301] = .11, *p* = .054), any new arrest (*r*[301] = .04, *p* = .527), and any arrest (*r*[301] = -.01, *p* = .907).

Pretrial Misconduct Outcomes	Risk Level						Comparison	
	Low		Moderate		High			
	n	%	*n*	%	*n*	%	X^2 (*df*)	Cramer's V
Any FTA	5	6.8	32	19.9	19	27.9	11.0** (2)	0.19
Any New Arrest	8	10.8	34	21.1	19	27.9	6.68* (2)	0.15
Any Arrest	19	25.7	69	42.9	31	45.6	7.74* (2)	0.16
Any Pretrial Misconduct (with Any New Arrest)	11	14.9	51	31.7	28	41.2	12.39** (2)	0.20
Any Pretrial Misconduct (with Any Arrest)	20	27.0	71	44.1	34	50.0	8.86* (2)	0.17

Note. *$p < .05$. **$p < .01$. ***$p < .001$

Table 1. Crosstabulations of Risk Levels and Pretrial Misconduct Outcomes

Predictive Validity Analyses

AUC of the ROC. AUC values were 0.67 (*SE* = 0.04, 95% CI: 0.60 – 0.74) for any FTA, 0.62 (*SE* = 0.04, 95% CI: 0.55 – 0.69) for any new arrest, and 0.60 (*SE* = 0.03, 95% CI: 0.53 – 0.66) for any arrest. These values correspond to a good level of predictive accuracy for any FTA, and a fair level of predictive accuracy for any new arrest and any arrest.

Logistic Regression Models. We present the results of a series of logistic regression analyses modeling pretrial misconduct outcomes while controlling for time at risk in Table 2. The results showed a good predictive validity of IRAS-PAT risk assessments across any FTA, any new arrest, and any arrest. Specifically, each 1-point increase in risk score was associated with a 1.43 times greater likelihood of any FTA, a 1.26 times greater likelihood of any new arrest, and a 1.20 times greater likelihood of any arrest. IRAS-PAT risk levels were able to differentiate between the likelihood of FTA for High risk defendants compared to Low risk defendants (OR = 6.47), and for Moderate risk defendants compared to Low risk defendants (OR = 3.84). Similarly, in the detection of any new arrest, defendants at High risk compared to Low risk were 3.37 times more likely to be arrested on any new offense, and defendants at Moderate risk compared to Low risk were 2.27 times more likely to be arrested on any new offense; however, differences between Moderate risk defendants and Low risk defendants were not significant (p = .053). IRAS-PAT risk levels significantly differentiated between likelihood of any arrest for High risk defendants compared to Low risk defendants (OR = 2.44) and for Moderate risk defendants compared to Low risk defendants (OR = 2.18).

Predictor	Pretrial Misconduct Outcomes														
	Any FTA					Any New Arrest					Any Arrest				
	Estimate	*SE*	Wald X^2	OR	95% CI	Estimate	*SE*	Wald X^2	OR	95% CI	Estimate	*SE*	Wald X^2	OR	95% CI
Total Score															
IRAS-PAT	0.36	0.09	16.72***	1.43	1.21, 1.70	0.23	0.08	8.73**	1.26	1.08, 1.48	0.19	0.06	8.44**	1.20	1.06, 1.37
Time at Risk	0.00	0.00	7.29**	1.00	1.00, 1.00	0.00	0.00	1.31	1.00	1.00, 1.00	0.00	0.00	0.11	1.00	1.00, 1.00
Risk Level															
Moderate (Low)	1.35	0.52	6.76**	3.84	1.39, 10.58	0.82	0.42	3.73	2.27	0.99, 5.20	0.78	0.31	6.27*	2.18	1.18, 4.00
High (Low)	1.87	0.56	11.27***	6.47	2.18, 19.25	1.22	0.47	6.77**	3.37	1.35, 8.43	0.89	0.36	6.03*	2.44	1.20, 4.97
Time at Risk	0.00	0.00	5.80*	1.00	1.00, 1.00	0.00	0.00	0.92	1.00	1.00, 1.00	0.00	0.00	0.02	1.00	1.00, 1.00

Note. *p < .05 **p < .01. ***p < .001. OR = odds ratio. N = 303.

Table 2. Logistic Regression Models of IRAS-PAT Total Scores and Risk Level Predicting Pretrial Misconduct Outcomes

Survival Models. We show the survival model results in Table 3. As shown, each 1-point increase in IRAS-PAT score was associated with a 1.41, 1.28, and 1.18 times increased hazard of any FTA, any new arrest, and any arrest respectively. Across pretrial misconduct outcomes, risk levels were more discriminating in predicting the hazard of FTA outcomes (HR range: 3.51 – 6.14) versus rearrest outcomes (HR range: 1.77 – 3.47). Overall, High risk level estimates were stronger in predicting the hazard of pretrial misconduct relative to Low risk level outcomes compared to Moderate risk level estimates relative to Low risk outcomes.

Predictor	Pretrial Misconduct Outcomes														
	Any FTA					Any New Arrest					Any Arrest				
	Estimate	*SE*	Wald X^2	HR	95% CI	Estimate	*SE*	Wald X^2	HR	95% CI	Estimate	*SE*	Wald X^2	HR	95% CI
Total Score															
IRAS-PAT	0.34	0.07	22.05***	1.41	1.22, 1.62	0.25	0.07	12.71***	1.28	1.19, 1.47	0.17	0.05	11.84***	1.18	1.07, 1.30
Risk Level															
Moderate (Low)	1.26	0.48	6.71**	3.51	1.36, 9.09	0.76	0.40	3.69	2.14	0.98, 4.67	0.57	0.26	4.86*	1.77	1.07, 2.95
High (Low)	1.82	0.51	12.70***	6.14	2.26, 16.68	1.24	0.43	8.47**	3.47	1.50, 8.00	0.78	0.29	7.05**	2.17	1.23, 3.86

Note. *p < .05 **p < .01. ***p < .001. HR = hazard ratio. N = 303.

Table 3. Cox Regression Survival Models of IRAS-PAT Total Scores and Risk Levels Predicting Pretrial Misconduct Outcomes

We present the survival curves by IRAS-PAT risk level and outcome in Figure 4. Each line represents the proportion of defendants who did not experience that outcome for each day of case processing time in the community. Typically, we would like to see good separation in each line to suggest that each risk level is associated with a different hazard of pretrial misconduct across the case processing period. As shown, there is good separation across FTA and any new arrest outcomes, providing evidence of predictive validity of risk levels even with different amounts of exposure time in the community. However, there is less separation between Moderate and High risk levels for any arrest.

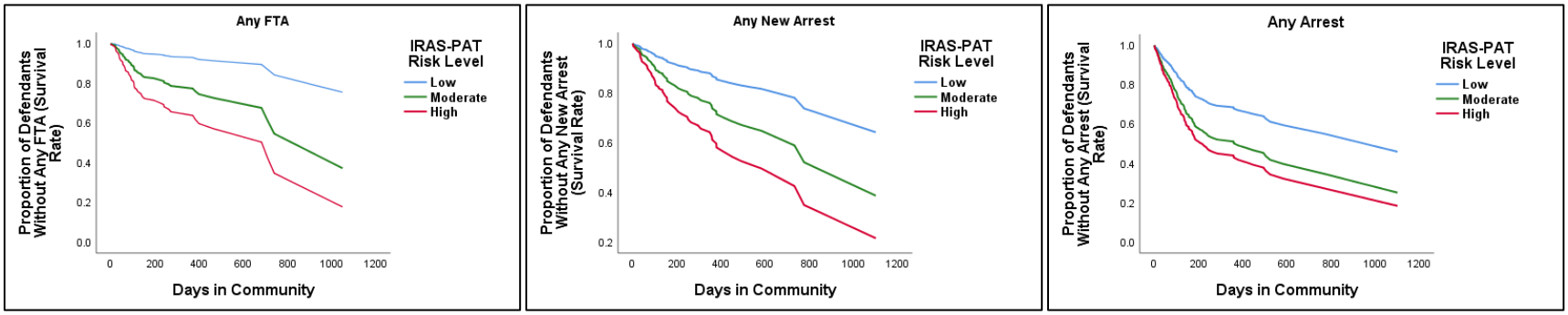

Figure 4. Survival Curves for Pretrial Misconduct Outcomes

Item-Level Analysis

We present the results of logistic regression models of IRAS-PAT items predicting pretrial misconduct outcomes in Table 4. Individual IRAS-PAT items varied in their prediction of FTA and rearrest outcomes. Item 4 (Unemployment only) and Item 6 (Illegal Drug Use in Past 6 Months) significantly predicted any FTA. For these items, individuals who were not employed (OR = 2.08, p = .037) and reported illegal drug use in the past six months (OR = 2.63, p = .049) reported higher odds of FTA. For any new arrest, only Item 4 (Unemployment only) significantly predicted this outcome. Individuals who were not employed were 2.45 times more likely to be rearrested on a new charge compared to full-time employed defendants (p = .008). Similarly, Item 4 (unemployment) significantly predicted any arrest. No employment compared to full-time employment (OR = 1.72, p = .041) was associated with higher odds of being arrested on any charge. Item 1 (Age at First Arrest), Item 2 (Prior FTAs), Item 3 (Three or More Prior Incarcerations), Item 5 (Residential Stability), and Item 7 (Severe Drug Use Problem) did not uniquely contribute to the prediction of any of the three assessed pretrial misconduct outcomes.

Predictor	Pretrial Misconduct Outcomes														
	FTA					Any New Arrest					Any Arrest				
	Estimate	*SE*	Wald X^2	OR	95% CI	Estimate	*SE*	Wald X^2	OR	95% CI	Estimate	*SE*	Wald X^2	OR	95% CI
Age at first arrest – (33+)	0.12	0.55	0.05	1.13	0.39, 3.29	0.41	0.53	0.59	1.50	0.53, 4.25	0.19	0.38	0.26	1.21	0.58, 2.56
One prior FTA (None)	0.04	0.51	0.01	1.04	0.39, 2.81	0.44	0.45	0.93	1.55	0.64, 3.78	0.36	0.40	0.81	1.43	0.66, 3.10
Two or more prior FTAs (None)	0.16	0.58	0.07	1.17	0.37, 3.68	0.39	0.54	0.52	1.47	0.51, 4.23	0.47	0.48	0.96	1.60	0.63, 4.07
Three+ Prior Incarcerations (No)	0.63	0.34	3.40	1.87	0.96, 3.64	0.34	0.32	1.10	1.40	0.75, 2.62	0.30	0.27	1.29	1.35	0.80, 2.28
Employed – Part-Time (Full-Time)	-0.43	0.61	0.49	0.65	0.20, 2.16	0.40	0.51	0.63	1.50	0.55, 4.04	0.35	0.38	0.85	1.42	0.67, 3.02
Employed – Not Employed (Full-Time)	0.73	0.35	4.37*	2.08	1.05, 4.13	0.90	0.34	6.95**	2.45	1.26, 4.78	0.54	0.27	4.17*	1.72	1.02, 2.91
Residential Stability (In Residence 6 Mo)	0.36	0.33	1.22	1.44	0.76, 2.73	0.15	0.31	0.22	1.16	0.63, 2.13	-0.05	0.26	0.04	0.95	0.57, 1.58
Illegal Drug Use 6 Months (No)	0.97	0.49	3.88*	2.63	1.01, 6.90	-0.67	0.51	1.78	0.51	0.19, 1.37	-0.28	0.39	0.52	0.75	0.35, 1.63
Severe Drug Use Problem (No)	-0.09	0.45	0.04	0.92	0.38, 2.24	0.60	0.50	1.44	1.83	0.68, 4.89	0.44	0.39	1.31	1.56	0.73, 3.34
Time at Risk	0.00	0.00	6.36*	1.00	1.00, 1.00	0.00	0.00	1.50	1.00	1.00, 1.00	0.00	0.00	0.19	1.00	1.00, 1.00

Note. *p < .05 **p < .01. ***p < .001. OR = odds ratio. N = 303.

Table 4. Logistic Regression Models of IRAS-PAT Items Predicting Pretrial Misconduct Outcomes

Figure 5 presents the rates of pretrial misconduct separately by outcome and IRAS-PAT item response. Thus, the reader can compare how the rate of any FTA, for example (dark gray bar), differs across individuals who were 33+ (i.e., a score of 0 on the item) or under 33 (i.e., a score of 1 on the item). The difference between rates of a given outcome across scoring categories for a single outcome provides an indication of how discriminating that item is in predicting misconduct (i.e., how much greater is the rate of misconduct for an individual who has a "1" coded response on that item versus a "0" response). A discriminating item successfully distinguishes between individuals who do or do not go on to commit misconduct. As shown in Figure 5, Item 1 (Age at First Arrest), Item 2 (FTAs Within the Last 24 Months), Item 3 (Three or More Prior Incarcerations), and Item 4 (Employment) were the most discriminating IRAS-PAT items for FTA and rearrest outcomes. Item 5 (Residential Stability) was the least discriminating overall item.

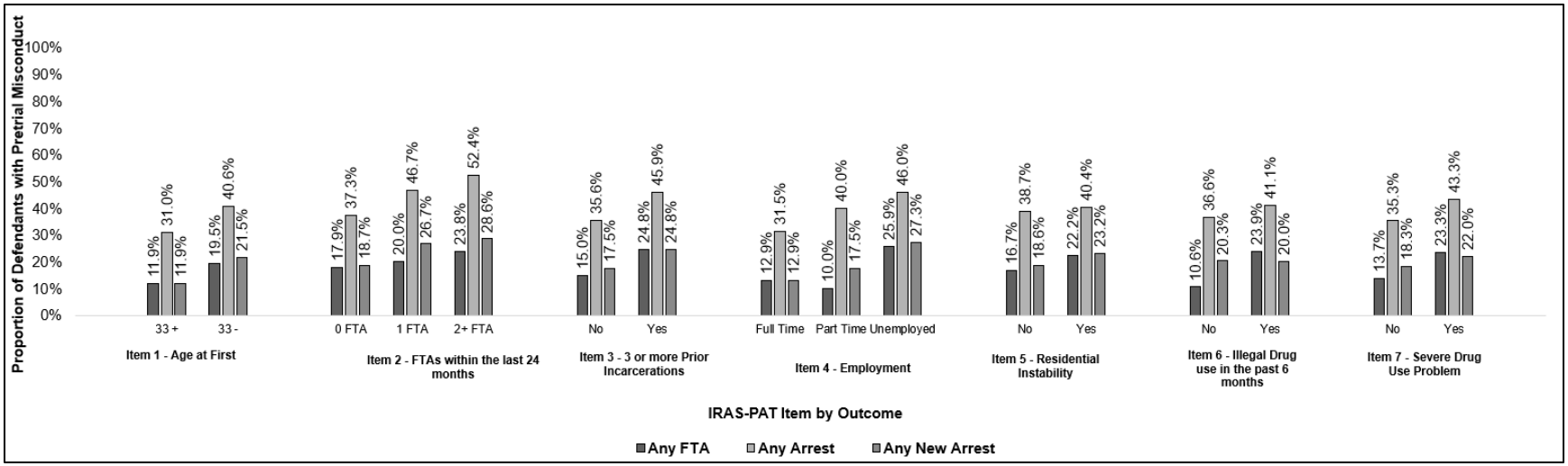

Figure 5. Rates of Pretrial Misconduct by IRAS-PAT Item Response and Outcome

SUMMARY OF FINDINGS

Overall, several findings emerged from the present investigation:

- IRAS-PAT total scores predicted any FTA, any arrest, and any new arrest risk with fair to good levels of accuracy.
- IRAS-PAT risk levels generally differentiated between defendants at Low and Moderate risk of pretrial misconduct.
- Item 4 (Unemployment only) and Item 6 (Drug Use in Last 6 Months) uniquely predicted any FTA. Only Item 4 (Unemployment) uniquely predicted re-arrest outcomes.
- Roughly half of defendants classified as High risk experienced some type of misconduct prior to the end of case disposition, relative to 44% of Moderate risk and 27% of Low risk defendants.

DISCUSSION

The purpose of this investigation was to examine the predictive validity of IRAS-PAT assessments conducted in practice on pretrial misconduct outcomes in Starke County, Indiana. In a sample of 303 defendants, we found IRAS-PAT assessments showed good-to-fair levels of predictive accuracy. Predictive accuracy was stronger for the assessment of any FTA risk; however, assessments were still fair predictors of arrest outcomes. Almost no IRAS-PAT items uniquely contributed to the prediction of pretrial misconduct outcomes, with the exception of Item 4 (Unemployment only) and Item 6 (Drug Use in Last 6 Months). Below we discuss these findings in greater detail.

Overall, IRAS-PAT assessments were stronger predictors of any FTA than arrest outcomes. Roughly one in five defendants experienced any FTA during the pretrial period. The lower predictive accuracy for arrest outcomes was driven by few differences in rates of misconduct for Moderate and High risk defendants. Specifically, rates of misconduct between Moderate and High risk defendants were fairly comparable for both any new arrest (21.1 vs. 27.9%) and any arrest (42.9 vs. 45.6%). Although a considerable proportion of Low risk defendants experienced an arrest during the pretrial release period (25.7%), this rate was still far lower than the proportion of Moderate risk defendants who experienced an arrest. The lower arrest rate among High risk individuals could be due to local pretrial policies and practices. In any validation conducted in the context of routine practice, intervention during the outcome period has the potential to lower the rate of misconduct relative to what would be observed in the absence of any intervention (Douglas et al., 2011). When this intervention occurs differentially for individuals assessed at specific risk levels (e.g., High risk individuals receive more intensive supervision and release conditions), the strength of predictive validity estimates can be lowered.

One unique feature of this validation was the length of the study period. Specifically, due to the small volume of assessments in the county, we employed a 5-year study period (January 1st, 2016 to December 31st, 2020) to include as many assessments as possible in the validation. However, there may have been evolving local practices during this time that could have affected the target population for IRAS-PAT assessments as well as the level of intervention provided to defendants in the community. Because the sample size was small, we did not examine whether predictive validity estimates differed across years, which may have pointed to specific

intervention occurring during the pretrial release period. The length of the study period also meant that we were able to observe the full case processing period for a greater proportion of the sample relative to other validations. As a result, the average length of time in the community (i.e., 300 days) was almost double the length of time observed in other locally conducted validations (Lowder et al., 2020). However, notably, the length of time in the community was unrelated to whether a defendant would experience pretrial misconduct.

At the item-level, we identified only two IRAS-PAT items that uniquely predicted pretrial misconduct above all other items. These included Item 4 (Unemployment) and Item 6 (Illegal Drug Use in Past 6 Months). Unemployment, in particular, was the strongest and most consistent predictor of pretrial misconduct among all outcomes. This finding may suggest that employment is a particularly salient criminogenic need in the Starke County pretrial population. Indeed, unemployment is one of the strongest risk factors for subsequent criminal activity among justice-involved populations broadly (Yukhnenko et al., 2020); the same is also true for substance use. Specifically, illegal drug use in the past six months was a strong predictor of any FTA. No other variables emerged as unique predictors of pretrial misconduct, likely due to the small validation sample size. However, when we looked descriptively at overall rates of failure by outcome (i.e., Figure 5), all items were fairly consistently linked to higher levels of misconduct. Yet, the magnitude of these differences varied considerably across items. Together, these findings suggest most items contributed jointly to explaining pretrial misconduct risk rather than providing unique predictive utility to assessments.

We acknowledge several limitations of this investigation. Primarily, the sample size was smaller than many other locally conducted validations of IRAS-PAT assessments in Indiana. The small sample size limited our ability to conduct a robust test of item-level predictive accuracy. Second, a considerable proportion of assessments (i.e., 26%) that were linked to both court case records and an index jail admission could not be included in the validation because individuals had no time at risk in the community. Despite this limitation, there was little difference in IRAS-PAT total scores in the sample (M = 3.92, SD = 1.93) and the overall population of assessments (M = 4.33, SD = 1.93); both groups had an average score of approximately 4, corresponding to a Moderate risk classification. Finally, relative to other local validations conducted in Indiana, the study period for this validation was considerably longer. The advantage to including assessments conducted across a 5-year period was a larger sample size; however, there is also the potential for changing local practices during this period that may have affected validation findings.

Overall, this investigation provides some support for the predictive validity of IRAS-PAT assessments conducted in Starke County, particularly for any FTA. Predictive accuracy was slightly lower for arrest outcomes, which was driven by lower rates of misconduct among High risk individuals.

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Appendix I: Risk Distribution by Race, Sex, Age, and Charge Level

We conducted supplemental analyses to examine the distribution of risk levels and pretrial outcomes by demographic characteristics of defendants and highest charge level. Because there were few defendants classified in specific demographic subgroups (i.e., Black defendants), we present these breakdowns for descriptive purposes only.

Results

Race. As shown in Table 5, Moderate risk Black defendants had higher rates of pretrial misconduct for any FTA and any arrest compared to White defendants. For Low risk, Black defendants recorded higher rates for any arrest only. Moderate risk White defendants recorded higher rates of any new arrest to Black defendants. There were no Black defendants classified at High risk.

Pretrial Misconduct Outcomes	Risk Level					
	Low		Moderate		High	
	Black	White	Black	White	Black	White
	n (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)
Any FTA	0 (0.00)	5 (6.94)	1 (50.00)	31 (20.26)	N/A	18 (27.27)
Any New Arrest	0 (0.00)	8 (11.11)	0 (0.00)	32 (20.92)	N/A	17 (25.76)
Any Arrest	1 (100.0)	18 (25.00)	1 (50.0)	65 (42.48)	N/A	29 (43.94)

Table 5. Crosstabulations of Risk Levels and Pretrial Misconduct Outcomes by Race

Sex. As shown in Table 6, Low risk male defendants had higher rates of pretrial misconduct for FTA and any arrest relative to female Low risk defendants. For any new arrest at Low risk, rates were approximately equal. At Moderate risk, female defendants had higher rates of pretrial misconduct for any new arrest and any arrest, but lower rates of any FTA. High risk male defendants had higher rates of any new arrest and any arrest compared to High risk female defendants. For any FTA, however, female defendants recorded higher rates.

Pretrial Misconduct Outcomes	Risk Level					
	Low		Moderate		High	
	Male	Female	Male	Female	Male	Female
	n (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)
Any FTA	3 (5.45)	2 (10.53)	23 (20.72)	9 (18.0)	9 (22.50)	10 (35.71)
Any New Arrest	6 (10.91)	2 (10.53)	23 (20.72)	11 (22.00)	12 (30.00)	7 (25.00)
Any Arrest	13 (23.64)	6 (31.58)	46 (41.44)	23 (46.00)	19 (47.50)	12 (42.86)

Table 6. Crosstabulations of Risk Levels and Pretrial Misconduct Outcomes by Sex

Age. For the purposes of comparison, we grouped defendants ages 18-35 as well as defendants who were 36 and older. As shown in Table 7, the younger age group had lower rates of FTA for Low risk levels, but higher rates of new arrest and any arrest. Older defendants assessed at Moderate risk and High risk had lower rates of pretrial misconduct across all outcomes.

Pretrial Misconduct Outcomes	Risk Level					
	Low		Moderate		High	
	18-35	36+	18-35	36+	18-35	36+
	n (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)
Any FTA	2 (6.25)	3 (7.14)	19 (20.21)	13 (19.40)	15 (30.61)	4 (21.05)
Any New Arrest	4 (12.50)	4 (9.52)	21 (22.34)	13 (19.40)	16 (32.65)	3 (15.79)
Any Arrest	10 (31.25)	9 (21.43)	44 (46.81)	25 (37.31)	24 (48.98)	7 (36.84)

Table 7. Crosstabulations of Risk Levels and Pretrial Misconduct Outcomes by Age

Charge level. Charge level was coded based on the highest charge at booking (misdemeanor or felony). As shown in Table 8, felony level defendants assessed at Low risk had lower rates of pretrial misconduct for all outcomes. At Moderate risk, Felony level defendants recorded lower rates of any new arrest, but higher rates of FTA and any arrest. Felony defendants assessed at High risk had higher rates of FTA, but lower rearrest rates compared to Misdemeanor defendants at High risk.

Pretrial Misconduct Outcomes	Risk Level					
	Low		Moderate		High	
	Misdemeanor	Felony	Misdemeanor	Felony	Misdemeanor	Felony
	n (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)	*n* (%)
Any FTA	1 (11.11)	4 (6.15)	1 (11.11)	31 (20.39)	2 (22.22)	17 (28.81)
Any New Arrest	1 (11.11)	7 (10.77)	3 (33.33)	31 (20.39)	4 (44.44)	15 (25.42)
Any Arrest	3 (33.33)	16 (24.62)	3 (33.33)	66 (43.42)	5 (55.56)	26 (44.07)

Table 8. Crosstabulations of Risk Levels and Pretrial Misconduct Outcomes by Charge Level