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PRETRIAL DRUG TESTING AND DEFENDANT RISK

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I. THE FOCUS ON DRUG ABUSE AS A PREDICTOR OF DEFENDANT CRIME[1]

A. BACKGROUND: DRUG TESTING AT THE PRETRIAL STAGE

The idea that a great deal of crime—at least in the major urban centers—is closely tied to drug abuse has received renewed attention from all branches of government. Recent research reports suggest, for example, that drug abuse both plays a role in the development of "criminal careers"[2] and figures importantly as a cri-

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[2] M. CHAIKEN & J. CHAIKEN, VARITIES OF CRIMINAL BEHAVIOR (1982); CRIMINAL CAREERS AND "CAREER CRIMINALS" (A. Blumstein, J. Cohen & C. Visher eds. 1986).

terion in arguments favoring policies of selective incapacitation at the sentencing stage of the criminal justice process.[3] At the same time, drug testing technology has become available to private industry. Proponents of drug testing (which had established a track-record in military applications) argue that this rapidly evolving drug testing technology represents an opportunity for a dramatic new direction in the campaign against drug abuse. President Bush signalled his agreement in his national drug control strategy, where he called for the widespread adoption of drug testing by both state and federal criminal justice systems.[4]

The criminological literature shows an association between drug use and delinquency.[5] Recently, some have hypothesized that drug use may be a significant predictor of crime during the pretrial release period.[6] Indeed one official has argued that drug testing data may provide "the most important" information, even more important than information about a defendant's prior criminal record, for assessing the risk posed by a defendant considered for pretrial release.[7]

Pioneered in the District of Columbia in 1984, routine urinalysis of arrestees prior to the bail or pretrial release decision has a

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[3] P. GREENWOOD & A. ABRAHAMSE, SELECTIVE INCAPACITATION (1982) [hereinafter P. GREENWOOD & A. ABRAHAMSE].

[4] THE WHITE HOUSE, NATIONAL DRUG CONTROL STRATEGY 100 (Sept. 1989). President Bush's "National Drug Control Strategy" would

> condition receipt of Federal criminal justice funds upon States: 1) adopting drug testing programs that will include arrestees, prisoners, parolees, and those out on bail, and 2) using test results appropriately in bail, sentencing, early release, probation, and parole decisions.
>
> The Administration will establish a policy of testing Federal arrestees, prisoners, and parolees for illegal drug use.

Id.

[5] R. GANDOSSY, J. WILLIAMS, J. COHEN & H. HARWOOD, DRUGS AND CRIME: A SURVEY AND ANALYSIS OF THE LITERATURE (1980) (prepared for U.S. Dep't of Just., Nat'l Inst. of Just.) [hereinafter R. GANDOSSY].

[6] *See, e.g.*, Smith, Wish & Jarjoura, *Drug Use and Pretrial Misconduct in New York City*, 5 J. QUANTITATIVE CRIMINOLOGY 101 (1989) [hereinafter Smith]; M. Toborg, A. Yezer & J. Bellassai, Analysis of Drug Use Among Arrestees (Monograph No. 4, 1987) (unpublished report) (preliminary assessment of pretrial urine testing in the District of Columbia) [hereinafter M. Toborg, Analysis of Drug Use]; A. Yezer, R. Trost, M. Toborg, J. Bellassai & C. Quintos, Periodic Urine Testing as a Signalling Device for Pretrial Release (Monograph No. 5, 1987) (unpublished report) (preliminary assessment of pretrial urine testing in the District of Columbia) [hereinafter A. Yezer, Periodic Urine Testing]; A. Yezer, R. Trost, M. Toborg, J. Bellassai, and C. Quintos, The Efficiency of Using Urine Test Results in Risk Classification of Arrestees (Monograph No. 6, 1987) (unpublished report) (preliminary assessment of pretrial urine testing in the District of Columbia) [hereinafter A. Yezer, The Efficiency of Using Urine]; E. WISH, DRUG USE FORECASTING: NEW YORK, 1984 TO 1986 (1987) (prepared for U.S. Dep't of Just., Nat'l Inst. of Just.).

[7] Conversations with Jay Carver, Director of the District of Columbia Pretrial Services Agency (1988).

relatively short history. Drug testing had been used previously on an occasional basis in pretrial diversion and to enforce conditions of probation. In 1984, the announcement of preliminary findings from research in New York City and the District of Columbia pointing to a relationship between positive drug test results and new arrests[8] prompted efforts to test arrestees prior to bail more systematically.[9]

Beginning in 1984, the District of Columbia Pretrial Services Agency implemented a model program of testing designed to inform judges about defendants' drug abuse and to monitor the behavior of defendants granted conditional, nonfinancial release before trial. Under the D.C. program, arrestees testing positively are required, as a condition of release, to report for further urinalysis and, as needed, for referral to drug counseling.[10] A failure to comply with the monitoring and reporting conditions of release could result in the setting of more restrictive conditions (including increased monitoring) or even the revocation of release.

Since implementation of the D.C. program, findings have been reported showing a relationship between positive urinalysis results at the bail stage and subsequent criminality or flight by defendants during pretrial release. In addition, the same studies purported to show that drug testing as a condition of release has been successful

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8 Wish & Johnson, *The Impact of Substance Abuse on Criminal Careers*, in CRIMINAL CAREERS AND "CAREER CRIMINALS" (A. Blumstein, J. Cohen, J. Roth & C. Visher eds. 1986) [hereinafter CRIMINAL CAREERS].

9 The development of drug testing at the bail stage can be understood more broadly, however, in the context of a traditional bail reform emphasis on drug abuse and related concerns. *See, e.g.*, Goldkamp, *Danger and Detention: A Second Generation of Bail Reform*, 76 J. CRIM. L. & CRIMINOLOGY 1 (1985) [hereinafter Goldkamp, *Danger and Detention*]. Likewise, drug testing at the bail stage was influenced by the development of a contemporaneous body of drug abuse literature showing a strong relationship between drug abuse (mostly heroin abuse at the time) and crime. *See, e.g.*, Ball, Shaffer & Nurco, *The Day-to-Day Criminality of Heroin Addicts in Baltimore: A Study in the Continuity of Offense Rates*, 12 DRUG & ALCOHOL DEPENDENCE 119 (1983) [hereinafter Ball, *Day-to-Day Criminality of Heroin Addicts*]. The underlying rationale for the pilot urinalysis program in the District of Columbia reflected a pragmatic interpretation of research findings relating to the drug-crime link, and has been described by the Director of that agency in the following manner:

> The theoretical basis for the program is derived from earlier studies that show, among other things, that drug use is very much a characteristic of serious and violent offenders. On the other hand, even among high-risk individuals with established patterns of both drug abuse and criminality, increasing or reducing the level of drug abuse is associated with a corresponding increase or reduction in criminality.

Carver, *Drugs and Crime: Controlling Use and Reducing Risk Through Testing*, N.I.J. REPORTS, Sept.-Oct. 1986, at 2-3.

10 Perhaps the most famous case of the use of such release conditions involved Marion Barry, the Mayor of the District of Columbia, after his arrest on misdemeanor drug charges in January, 1990.

in increasing the likelihood of appearance for court dates and in decreasing the rate of further crime among released defendants.[11] The experience of the District of Columbia's testing program, combined with the growing acceptance of the hypothesis that urinalysis is an important and, because it is scientific, a superior instrument for both identifying "the high risk offender" and minimizing the risk posed by defendants during pretrial release, have stirred interest in wider-scale establishment of arrestee drug testing programs.[12]

The enactment of the Federal Bail Reform Act of 1984[13]—the federal preventive detention law aimed at bolstering community safety through the identification and incapacitation of a "small but identifiable group of particularly dangerous defendants"[14]—gives added significance to the debate surrounding the introduction of drug testing at the pre-bail stage for the purposes of "identifying the high rate offender." Like the laws enacted in the District of Columbia in 1970 and many states,[15] the Federal Act (a) emphasizes the drug-crime relationship in its designation of factors to be considered by judges in establishing conditions of release,[16] (b) in-

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11 *See* M. Toborg, Analysis of Drug Use, *supra* note 6; A. Yezer, Periodic Urine Testing, *supra* note 6; and A. Yezer, The Efficiency of Using Urine, *supra* note 6. These unpublished monographs describing research that evaluated the drug testing program in Washington, D.C., report the following: first, above and beyond the power of other kinds of information to predict the likelihood of flight and crime during pretrial release, knowledge of positive drug test results serves as an important measure of defendant risk; and second, drug testing itself can be employed effectively as a condition of pretrial release to reduce crime and flight. Smith, *supra* note 6, reported that drug test results from a large sample of New York City defendants added to the ability to predict bail crime. *But see* S. BELENKO & I. MARA-DRITA, DRUG USE AND PRETRIAL MISCONDUCT: THE UTILITY OF PRE-ARRAIGNMENT DRUG TEST AS A PREDICTOR OF FAILURE-TO-APPEAR (1988) [hereinafter S. BELENKO & I. MARA-DRITA] (in describing similar research in New York [based on the same data set], the authors report that knowledge of drug test results contributes little to a judge's ability to predict defendant flight prior to trial).

12 The Bureau of Justice Assistance (BJA), for example, has funded demonstration projects to test the applicability of the D.C. testing program to other jurisdictions, including Tucson, Phoenix, Milwaukee, Portland, Wilmington and Prince George's County, Maryland. Results of evaluation research in these sites is forthcoming. The principal investigators for these BJA drug testing programs are Goldkamp *et al.*, 1990 (forthcoming); Gottfredson *et al.*, 1990 (forthcoming); and Kapsch & Sweeney, 1990 (forthcoming). Similarly, the National Institute of Justice funded the Drug Use Forecasting (DUF) program to test arrestees on a quarterly basis in the principal American cities to chart the kinds of drugs being used among arrestee populations. Finally, the Arizona legislature enacted a law in 1987 to include the results of drug tests of felony arrestees in the information used by the court for the purpose of informing its pretrial release decisions. *See* ARIZ. REV. STAT. ANN. § 13-3967(C) (1989).

13 18 U.S.C. § 3142(e) (1988).

14 S. REP. No. 225, 98th Cong., 1st Sess. 6-7 (1983).

15 *See* Goldkamp, *Danger and Detention*, *supra* note 9.

16 Section 3142(g), entitled "Factors to Be Considered," urges judicial consideration of drug related concerns in two provisions: first, in considering the "nature and circum-

cludes drug-related offenses among the criteria qualifying defendants for detention hearings on the basis of potential dangerousness,[17] and (c) provides for the temporary detention of defendants to determine whether they are "addict[s]."[18] Thus, under the Federal Bail Reform Act, the linkage between drugs and the defendants or their cases is at issue in several of the provisions used to establish conditions of release. The Act's emphasis on the drug-crime relationship increases the prospect that defendants could be considered "dangerous" and may therefore warrant pretrial detention because no sufficient conditions of release could be found.

The United States Supreme Court in *United States v. Salerno*[19] found the preventive detention provisions of the Federal Bail Reform Act of 1984 to be constitutional in substance and procedure.[20] The *Salerno* decision appears to have silenced the long standing controversy about the appropriateness of community safety goals in the bail/pretrial release process. Thus, in legitimizing the public safety agenda of bail, the Federal Bail Reform Act of 1984 and the *Salerno* decision have provided a philosophical underpinning for the introduction of drug testing at the bail stage. Specifically, the use of urinalysis to detect drug use among defendants would appear to respond to the ongoing debate about how judges might best identify "dangerous" defendants.

The Federal Bail Reform Act of 1984's criteria for determining a defendant's eligibility for detention were derived largely, but not exclusively, from the 1970 District of Columbia prototype. Like earlier laws, the Federal Bail Reform Act assumes that defendants' criminal charges and prior records of convictions, among other items, can identify future criminals.[21] The laws adopted by state

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stances of the offense . . . including whether the offense . . . involves a narcotic drug;" and second, in considering the "history and characteristics" of the defendant, including his or her "[h]istory relating to drug or alcohol abuse." 18 U.S.C. § 3142(g).

17 Section 3142(f)(1)(C) outlines as one of the eligibility criteria for pretrial detention proceedings charged offenses "for which a maximum term of imprisonment of ten years or more is prescribed in the Controlled Substances Act (21 U.S.C. § 801 *et seq.*), the Controlled Substances Import and Export Act (21 U.S.C. § 951 *et seq.*), or section 1 of the Act of September 15, 1980 (21 U.S.C. § 955a)." 18 U.S.C. § 3142(f)(1)(C).

18 18 U.S.C. § 3142(f)(2) (1988).

19 481 U.S. 739 (1987).

20 *Id.*

21 The *Salerno* Court concluded that this congressional assumption was valid. *Id.* at 750. The *Salerno* decision also is important because of its position on standards for prediction at the pretrial release stage. A traditional argument of the opponents to preventive detention has been that judges are not able to predict the future acts of defendants with sufficient accuracy to warrant adoption of explicit preventive detention procedures. To this argument and the argument that pretrial detention on that basis is tantamount to punishment without due process, the Court responded that "there is nothing inher-

legislatures have suggested many similar criteria for judges to consider in making bail/pretrial release determinations, including aspects of the criminal charges, the defendant's community ties, his/her prior criminal record, and in a few instances, the defendant's history of drug abuse.[22] Although research has not produced empirical support that these, or other, statutory criteria can predict powerfully the likelihood of criminal acts by defendants during periods of pretrial release,[23] recent research has begun to develop empirical risk classifications that, if used, would at least offer improvements over the accuracy of judges' subjective assessments.[24]

Judicial reliance on the results of urinalysis to inform important decisions, such as the determination of conditions of pretrial release or even the prospect of pretrial detention, raises a number of questions similar to those raised about the use of other kinds of information, such as prior criminal history, for the same purpose.[25] At a

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ently unattainable about a prediction of future criminal conduct." *Id.* at 751 (quoting Schall v. Martin, 467 U.S. 253, 278 (1984)). Furthermore, the Court added that once courts perceive that a defendant poses a "threat" of some danger to the public, they may "disable the arrestee from executing that threat." *Id.* Of course, the federal law was the last, not the first, example of a law implementing "danger" classifications; a wide variety of state laws had been enacted in the previous 15 years employing hosts of danger criteria. *See* Goldkamp, *Danger and Detention*, *supra* note 9.

22 *See* Goldkamp, *Danger and Detention*, *supra* note 9; *see also*, J. GOLDKAMP, TWO CLASSES OF ACCUSED (1979).

23 *See* Angel, Green, Kaufman & Van Loon, *Preventive Detention: An Empirical Analysis*, 6 HARV. C.R.-C.L. L. REV. 289 (1971).

24 *See, e.g.*, Goldkamp, *Prediction in Criminal Justice Policy Development*, in PREDICTION AND CLASSIFICATION 103 (D. Gottfredson & M. Tonry eds. 1987); J. GOLDKAMP & M. GOTTFREDSON, POLICY GUIDELINES FOR BAIL (1985) [hereinafter J. GOLDKAMP & M. GOTTFREDSON, POLICY GUIDELINES]; M. TOBORG, A. YEZER, P. TSENG & B. CARPENTER, PRETRIAL ASSESSMENT OF DANGER AND FLIGHT: METHOD MAKES A DIFFERENCE (1984) [hereinafter M. TOBORG, METHOD MAKES A DIFFERENCE]; Goldkamp, *Bail, Discrimination and Control*, 16 CRIM. JUST. ABSTRACTS 1 (Mar. 1984); J. ROTH & P. WICE, PRETRIAL RELEASE AND MISCONDUCT IN THE DISTRICT OF COLUMBIA (1980) (prepared for U.S. Dep't of Just., Nat'l Inst. of Just.) [hereinafter J. ROTH & P. WICE].

Bail/pretrial release guidelines using risk classifications have been developed and, to varying degrees, implemented in Philadelphia, Pennsylvania; Dade County, Florida; and Maricopa County, Arizona. *See* J. GOLDKAMP & M. GOTTFREDSON, BAIL AND PRETRIAL RELEASE GUIDELINES IN THREE URBAN COURTS: VOLUME I — THE DEVELOPMENT OF BAIL/PRETRIAL RELEASE GUIDELINES IN MARICOPA COUNTY SUPERIOR COURT, DADE COUNTY CIRCUIT COURT AND BOSTON MUNICIPAL COURT (1988) [hereinafter J. GOLDKAMP & M. GOTTFREDSON, BAIL AND PRETRIAL RELEASE GUIDELINES, VOL.1]; J. GOLDKAMP, M. GOTTFREDSON & P. JONES, BAIL AND PRETRIAL RELEASE GUIDELINES IN THREE URBAN COURTS: VOLUME II—THE IMPLEMENTATION AND EVALUATION OF BAIL/PRETRIAL RELEASE GUIDELINES IN MARICOPA COUNTY SUPERIOR COURT, DADE COUNTY CIRCUIT COURT AND BOSTON MUNICIPAL COURT (1988) [hereinafter J. GOLDKAMP, M. GOTTFREDSON & P. JONES, BAIL AND PRETRIAL RELEASE GUIDELINES, VOL. II].

25 In effect, the Supreme Court in *Salerno* approved pretrial detention based on a risk classification subjectively defined by the legislature and discretionarily implemented by Federal magistrates despite the absence of empirical support. *Salerno*, 481 U.S. at 751.

minimum, this reliance on urinalysis will be rational[26] only when a demonstrable connection exists between the predictive information (*i.e.*, drug use) and "pretrial" crime and flight. Although a full appraisal of the utility of drug testing programs at the bail stage must include a discussion of the technique's ethical, constitutional,[27] and even cost-benefit implications,[28] the particular focus of this article is empirical. This article seeks to determine whether, given previous research and the clearly argued policy expectations of this methodology, knowledge of drug test results would add to the ability to assess the risk of flight and crime posed by felony defendants appearing at the bond hearing stage in Dade County's Circuit Court.[29]

B. DRUG ABUSE AND CRIME: INTERPRETING THE RELATIONSHIP FOR THE PURPOSES OF BAIL

The introduction of drug testing into pretrial release determinations cannot be viewed in isolation from the larger debate concerning interpretations of causality in the drug-crime relationship. By whatever measure, whether from self-reports of criminal activity[30] or from official data sources,[31] it has been shown that those involved in drug use also tend to be engaged in criminal activity. In fact, it is well established in the criminological literature that alcohol and drug use among juveniles are related to other forms of delinquency.[32] More recent research not only has verified the finding

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26 *See generally* M. GOTTFREDSON & D. GOTTFREDSON, DECISION-MAKING IN CRIMINAL JUSTICE: TOWARD THE RATIONAL EXERCISE OF DISCRETION (1988) (discussing "rationality" in criminal justice decision-making).

27 For a discussion of the constitutionality of drug testing at the pre-bail stage, see Rosen & Goldkamp, *The Constitutionality of Drug Testing at the Bail Stage*, 80 J. CRIM. L. & CRIMINOLOGY 114 (1989).

28 *See, e.g.*, J. CLARKE, ESTIMATING THE COSTS OF DRUG TESTING FOR A PRETRIAL SERVICES PROGRAM (1989) (prepared for Bureau of Justice Assistance, U.S. Dep't of Just.) [hereinafter J. CLARKE].

29 We specifically do not address here the question of the utility of drug testing as a method for monitoring defendants during pretrial release. Subsequent reports studying the impact of drug testing as monitoring programs should be available shortly through the National Institute of Justice and the Bureau of Justice Assistance. *See supra* note 12.

30 T. HIRSCHI, CAUSES OF DELINQUENCY (1969) [hereinafter T. HIRSCHI]; D. ELIOT, D. HUNZINGA & S. AGETON, EXPLAINING DELINQUENCY AND DRUG USE (1985) [hereinafter D. ELIOT].

31 *See generally* Moore, *Controlling Criminogenic Commodities: Drugs, Guns and Alcohol*, in CRIME AND PUBLIC POLICY 125 (J.Q. Wilson ed. 1983).

32 Early empirical work on delinquency using official data discovered that delinquent youth, in comparison to nondelinquents, tended to smoke and drink alcohol to a greater degree. S. GLUECK & E. GLUECK, UNRAVELING JUVENILE DELINQUENCY (1950). The relationship was so striking that in the early delinquency literature, smoking was seen as a precursor of serious problems with the law. Later, self-report research on drug use and drug abuse revealed the same findings.

that delinquents tend to smoke and drink more than nondelinquents,[33] it also has shown that such patterns persist for other drugs, such as marijuana and cocaine.[34]

Given that drug use and delinquency correlate, it is not surprising that researchers also have found the social and demographic correlates of each to be similar.[35] A recent, thorough review of the empirical literature on drug use and crime identified the correlates of drug addiction in the following fashion:

> In general, addicts tend to reside in urban centers . . . characterized by poverty, high rates of delinquency, and high concentrations of minority groups. In addition, addict families apparently are disturbed in some way; there are high rates of family disharmony, characterized by a lack of warmth and discipline. Furthermore, the educational attainment of addicts is quite low; few ever complete high school and many never attend.[36]

These correlates of drug addiction, of course, are also well known correlates of crime and delinquency. This similarity in the social and demographic correlates of drug use and of crime has spawned discussion of the following question: Are the correlates of drug use and other forms of crime and delinquency the same because the forces that produce antisocial behavior also produce drug use, or because drug use causes antisocial behavior?

One well known researcher has argued that: "compared to the abstaining teenager, the drinking, smoking, and drug taking teen is much more likely to be getting into fights, stealing, hurting other people, and committing other delinquencies."[37] "But," he added, "the variation in the order in which they take up these things leaves little basis for proposing causation of one by the other."[38] Similarly, recent self-report research which sought to establish a causal order for drug use and serious delinquency has been unable to do so, such that the results ultimately depend on the researcher's analytical decisions.[39] Yet, some researchers have documented a strong relationship between addiction and property crime,[40] and some have ar-

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[33] *See* T. HIRSCHI, *supra* note 30.

[34] With respect to the "hard" drugs and the problem of addiction, the general relationship with crime seems to be maintained as well.

[35] *See* D. ELIOT, *supra* note 30; M. HINDELANG, T. HIRSCHI & J. WEIS, MEASURING DELINQUENCY (1981); J. BACHMAN, L. JOHNSTON & P. O'MALLEY, MONITORING THE FUTURE (1978); D. KANDEL, LONGITUDINAL RESEARCH ON DRUG USE (1978).

[36] R. GANDOSSY, *supra* note 5, at xii.

[37] Akers, *Delinquent Behavior, Drugs and Alcohol: What is the Relationship?*, 3 TODAY'S DELINQUENT 19 (1984).

[38] *Id.*

[39] *See* D. ELIOT, *supra* note 30.

[40] *See, e.g.*, Ball, *Day-to-Day Criminality of Heroin Addicts*, *supra* note 9; Ball, Rosen,

gued that the causal nature of that connection is unquestionable.[41]

These debates about the relation between crime and drug use have important implications for crime and social policy. For example, the perspective that views drug use as another manifestation of the tendency to commit crime would argue that, in estimating the overall level of the tendency to commit crime, counts of drug misconduct will behave in the same way as counts of other misconduct. Accordingly, at whatever stage of the criminal process, those with higher counts of drug misconduct will be expected to manifest higher rates of other misconduct, such as parole violation, and pretrial crime or other forms of deviance. On the other hand, the perspective that drug use contributes directly to the likelihood of crime would attach great importance to the identification, treatment or restraint of drug users in the effort to reduce crime. We will return to these implications below, when we discuss hypotheses for this study.

C. RISK PREDICTION FOR BAIL AND DRUG USE

Almost from the beginning of the development of statistical risk measures in criminology, drug use has been a viable predictor candidate.[42] In the pretrial arena, however, the role of drug use in the development of risk classification tools has a much shorter research history. Researchers attempting to develop prediction instruments for pretrial flight and pretrial crime have studied the relation between officially recorded drug offenses and self-reported drug use

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Flueck & Nurco, *The Criminality of Heroin Addicts: When Addicted and When Off Opiates*, in THE DRUGS-CRIME CONNECTION (J. Inciardi ed. 1981); Ball, Rosen, Friedman & Nurco, *The Impact of Heroin Addiction Upon Criminality*, in PROBLEMS OF DRUG DEPENDENCE, 1979 163 (NIDA Research Monograph No. 27).

41 *See, e.g.*, Anglin & Speckart, *Narcotics Use and Crime: A Multisample, Multimethod Analysis*, 26 CRIMINOLOGY 197 (1988).

42 In the earliest and perhaps most thoroughly validated of such schemes, the California Base Expectancy Measure, a history of opiate use was included as an unfavorable indicator of parole success. *See* D. GOTTFREDSON & K. BALLARD, THE VALIDITY OF TWO PAROLE PRECIDTION SCALES (1964). Similarly, the "salient factor" score used by the United States Parole Commission, repeatedly validated on release cohorts, includes drug use variables. *See* Hoffman & Beck, *Revalidating the Salient Factor Score: A Research Note*, 8 J. CRIM. JUST. 185-88 (1980); D. GOTTFREDSON, L. WILKINS & P. HOFFMAN, GUIDELINES FOR PAROLE SENTENCING (1978). More recently, in the "selective incapacitation" literature, researchers have discovered that items about self-reported drug related behaviors are useful in prediction instruments. For example, Greenwood and Abrahamse included heroin or barbiturate use by an offender either in the two years prior to incarceration or as a juvenile in their prediction device for selective incapacitation. *See* P. GREENWOOD & A. ABRAHAMSE, *supra* note 3; *see also* M. CHAIKEN & J. CHAIKEN, *supra* note 2. Finally, no matter what the relation to subsequent crime actually is, it is now established that decisionmakers in the criminal justice system, from bail to parole, tend to use prior drug behavior as a decisionmaking criterion. S. Gottfredson, *Prediction*, in PREDICTION AND CLASSIFICATION (D. Gottfredson & M. Tonry eds. 1987).

and pretrial misconduct.[43] These studies found that measures of prior drug arrests or convictions frequently do relate to measures of pretrial misconduct. For example, Roth and Wice, Toborg and Kirby, and Toborg *et al.* all found that defendants who reported drug use to staff during their pretrial services interviews had higher rearrest and failure-to-appear rates than those who did not admit drug use.[44] Similarly, Goldkamp *et al.* found that those with a criminal history of drug arrests were over twice as likely to fail to appear and to be rearrested during the pretrial period as those without such a history.[45]

Prior research that employed drug indicators as predictors of pretrial misconduct appeared to have operated under the rationale that prior criminal involvement with drugs was another measure of criminal activity level; therefore, drug indicators occupied the same status for actuarial prediction as did other prior offense variables. In the Goldkamp and Gottfredson guidelines study, an official record of drug offenses was studied as a potential factor to be included in the risk dimension of the Philadelphia bail guidelines; however, it failed to emerge as a significant predictor in their multivariate analyses.[46] In more recent predictive analyses in the context of bail guidelines research, however, drug charges and convictions have fit into predictive classifications.[47] But whatever the rationale, a number of studies have found drug activity in defendants' prior criminal history to be related, at least at the bivariate level, to pretrial misconduct.

D. DRUG TESTING AND PREDICTION OF PRETRIAL MISCONDUCT: RECENT STUDIES

Three recent studies directly bear on our investigation of the

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[43] J. GOLDKAMP & M. GOTTFREDSON, BAIL AND PRETRIAL RELEASE GUIDELINES, VOL. I, *supra* note 24; M. TOBORG, METHOD MAKES A DIFFERENCE, *supra* note 24; J. AUSTIN, B. KRISBERG & P. LITSKY, SUPERVISED PRETRIAL RELEASE TEST DESIGN EVALUATION: EXECUTIVE SUMMARY (1983); J. GOLDKAMP, M. GOTTFREDSON & S. MITCHELL-HERZFELD, BAIL DECISIONMAKING: A STUDY OF POLICY GUIDELINES (1981) (prepared for U.S. Dep't of Just., Nat'l Inst. of Corrections) [hereinafter J. GOLDKAMP, BAIL DECISIONMAKING]; J. ROTH & P. WICE, *supra* note 24; Angel, Green, Kaufman & Van Loon, *Preventive Detention: An Empirical Analysis*, 6 HARV. C.R.-C.L. L. REV. 301 (1971).

[44] J. ROTH & P. WICE, *supra* note 24; M. TOBORG & M. KIRBY, DRUG USE AND PRETRIAL CRIME IN THE DISTRICT OF COLUMBIA (1984); M. TOBORG, METHOD MAKES A DIFFERENCE, *supra* note 24.

[45] J. GOLDKAMP, BAIL DECISIONMAKING, *supra* note 43.

[46] J. GOLDKAMP & M. GOTTFREDSON, POLICY GUIDELINES, *supra* note 24.

[47] J. GOLDKAMP & M. GOTTFREDSON, BAIL AND PRETRAIL RELEASE GUIDELINES, VOL. I, *supra* note 24; J. GOLDKAMP, M. GOTTFREDSON & P. JONES, BAIL AND PRETRIAL RELEASE GUIDELINES, VOL. II, *supra* note 24.

predictive contribution of drug testing. In each of these studies, the researchers asked whether—beyond prior criminal history measures and defendant self-reports during pre-bail interviews—more accurate measures of *contemporaneous* drug use from urinalysis usefully can be added to existing predictors of pretrial misconduct.

The first study, by Toborg Associates,[48] examined the Washington, D.C., pretrial services drug testing program. During the period studied in 1984, the D.C. Pretrial Services Agency tested incoming criminal defendants for five drugs, cocaine, PCP, amphetamines, heroin and methadone, just prior to their first appearance before a judge in Superior Court for a pretrial release determination. The testing program, which examined voluntarily-provided urine specimens,[49] sought to inform the judge's pretrial release decision. It also provided the court a condition of release—those defendants who tested positively could be candidates for urine monitoring after release. Defendants violated their conditions of release when they had two consecutive positive tests, or one positive test and one failure to appear, or three positive tests or failures to appear in a three month period.[50]

The research by Toborg Associates had several goals: (1) to determine the extent of drug use among the pretrial arrestee population; (2) to examine the relationship between positive drug test results and pretrial misconduct; (3) to assess the ability of drug test results to assist in the prediction of pretrial misconduct; and (4) to measure the value of a systematic drug testing program in monitoring defendants released prior to trial.

The research first detailed that the majority of defendants tested showed positive results for one of the controlled substances.[51] The researchers further found an empirical relation between drug testing results shortly after arrest and pretrial misconduct, both in bivariate and in multivariate analyses. They also reported that positive tests were associated with age (defend-

48 M. Toborg, Analysis of Drug Use, *supra* note 6; A. Yezer, Periodic Urine Testing, *supra* note 6; A. Yezer, The Efficiency of Using Urine, *supra* note 6.

49 The proportion of all entering defendants who volunteered is not stated in the study.

50 For those failing these monitoring program criteria, a program of "intensive" testing was "available," involving twice weekly testing with sanctions that included even more frequent testing, followed by a notification to the Court requesting a hearing to review conditions of release. The authors reported that judges reacted differently to these notices. Systematic data on the sanctioning process were not provided.

51 Fifty-three percent were found to test positively for some drug. The two most common categories for positive tests were PCP and cocaine. M. Toborg, Analysis of Drug Use, *supra* note 6, at Table 1.

ants under twenty-five years of age) and with prior record (the more extensive the record, the greater the likelihood of a positive test).[52] Some factors (specifically, employment status, open case status, and prior convictions) were used in a multivariate analysis of 3,841 cases[53] to determine whether specific drug test results were significantly related to pretrial misconduct, controlling for some selected predictors. Yezer et al. (1987) concluded that their findings "demonstrate that urine-test results do indeed make a consistent, significant, incremental contribution of pretrial risk classification for arrestees in the District of Columbia."[54]

The second study, reported by Belenko and Mara-Drita, was undertaken in collaboration with the New York City Criminal Justice Agency. The researchers sought to discover the relationship between positive drug test (EMIT) results at the pre-arraignment (pre-bail) stage and a subsequent failure to appear.[55] The sample consisted of 6,178 males who were arrested and held for arraignment in Manhattan during 1984.

In introducing their study, Belenko and Mara-Drita outlined the limitations of their sample for the purpose of discovering the relationship of drug use to pretrial misconduct.[56] The sample was collected by another agency, and the details of its collection and of the sampling frame are unknown. About ninety-five percent of the sample of arrestees approached at booking agreed to be interviewed, of whom eighty-four percent agreed to provide a specimen. Thus, about eighty percent of the target sample participated. Of those participating, the authors reported that 126 could not be found.

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52 *Id.* Table 2. Such factors have themselves been found in previous research to be related to pretrial misconduct. *See, e.g.*, J. GOLDKAMP, BAIL DECISIONMAKING, *supra* note 43.

53 The actual n used in each of the analyses is difficult to determine with certainty. We rely on A. Yezer, The Efficiency of Using Urine, *supra* note 6, at 25.

54 *Id.* at iii. The authors report that drug test results make "an incremental" contribution to the prediction of pretrial crime; unfortunately, the report does not provide sufficient information to appraise the empirical evidence supporting these conclusions. For example, the sample is not described by the authors for these analyses, and the number of subjects changes without explanation from table to table. (Table 3-1 has an n of 4,930 and Table 7-1 shows an n of 3,841.) In addition, the full correlation matrix is not provided for all of the variables in the set (including those chosen for the multivariate portions of the study), so it is unknown how the results depend on the largely unexplained selection of the three control variables in the equations. For example age is not included, although it is related both to drug test result and to pretrial misconduct.

55 Pretrial crime among these sample defendants was not studied by Belenko and Mara-Drita but was the subject of separate analyses published subsequently by Smith. *See* Smith, *supra* note 6.

56 The authors report that the study oversampled some charges (non-drug felony offenses), but the specific offenses and the sampling proportion were not presented.

The final sample thus represented about seventy-eight percent of the approached, booking-stage target sample (although what the target represented was unknown).[57] Of these, Belenko and Mara-Drita reported that 3,462, or fifty-six percent, were at risk (*i.e.*, released before adjudication) and served as the basis of the analysis.

Sample arrestees were tested for cocaine, opiates, methadone and phencyclidine via the EMIT method. Of those tested, fifty-six percent had a positive result, predominantly for cocaine. In contrast, twenty-seven percent of the interviewed arrestees claimed to have used drugs in the two days prior to arrest. There was a substantial relation between testing positively and the extent of the prior criminal involvement. Although arraignment judges had no knowledge of drug test results, release status at arraignment was associated with drug test results, such that drug-negative defendants were more likely to be released on personal recognizance and less likely to be held on bail than drug-positive defendants. (Quite likely, such a result is due to the empirical relationship between drug test results and other indicators of poor risk, particularly prior history, that are routinely available to judges.)

The authors measured failure-to-appear (FTA) by documenting the issuance of a bench warrant when the defendant did not appear for a scheduled court appearance. Nearly forty percent of the sample defendants failed to appear according to this criterion. Among many other factors related to defendants, their cases or criminal histories, drug test results were associated with failure to appear in the sample: forty-four percent of those testing positively compared with thirty-four percent of those testing negatively for drugs of abuse failed to appear in court at some stage and caused a bench warrant to be issued. A difference of roughly the same magnitude was found based on self-reported drug use when defendants self-reporting and self-reporting drug use were compared.

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[57] The authors caution as follows:

> We do not have sufficient information about the sample selection and interviewing process to assess whether the NDRI defendant sample truly represents the Manhattan arrestee population. That the interviews were done primarily in the evening might have skewed the sample. The arrestees were not randomly selected from all Manhattan defendants during the study period, nor did the oversampled non-drug felony arrests appear to be systematically selected. The extent to which defendants were selected to be approached for an interview by NDRI staff along any subjective or ill-defined criteria are unknown. The external validity of the sample is open to question: it is not clear whether the study results can be generalized to other jurisdictions.

S. BELENKO & I. MARA-DRITA, *supra* note 11, at 6. The authors contrasted the sample defendants with a random sample of Manhattan defendants along four variables (age, ethnicity, agency recommendation and prior criminal history) and did not find great differences between the two groups.

In their discriminant function analysis, Belenko and Mara-Drita sought to discover how much improvement in predictions of FTA could be achieved by adding drug test information to the existing pool of predictors. Given the existing and relatively inexpensive availability of these other predictors of failure-to-appear, the Belenko and Mara-Drita study is, in effect, an effort to determine whether the statistical contribution of drug test results could justify the expense that the implementation of a drug testing program in the pretrial setting would require. Their results indicated an overall low level of predictability of FTA, a level that was not enhanced by the addition of drug test information. They concluded that:

> [t]he results raise serious questions about the efficacy of mass drug screening of arrestees in order to identify defendants at risk for FTA. The multivariate analyses show that while it is difficult to reliably predict whether an individual defendant will FTA using information currently available to the arraigning judge, adding the drug test results does not improve upon this prediction. The analyses also suggest that self-reported drug use, while underreported, could identify large numbers of illicit drug users to divert to treatment or other supervision programs, and is equally predictive of FTA as is a urine test.[58]

The findings reported above in both studies—by Toborg Associates and by Belenko and Mara-Drita—share the bivariate findings that drug test results appear to be related to defendant misconduct during pretrial release. However, the studies disagree in their conclusions about the contributions made by such information when the effects of other kinds of data are controlled in multivariate analysis.

Using the data analyzed by Belenko and Mara-Drita, Smith conducted a similar examination of the relative contribution of drug testing information to the prediction of pretrial misconduct.[59] While the Belenko and Mara-Drita study had focused on failure-to-appear among the Manhattan defendants, the Smith *et al.* analysis focused on rearrest as well as FTA.[60] Because Smith *et al.* employed the same dataset (with the exception that rearrest data were added), the limitations of the sample outlined by Belenko and Mara-Drita concerning its representativeness of Manhattan defendants apply. Additionally, Table 1 indicates that there are discrepancies between the two versions of the data sets and the numbers of arrestees in various subgroups, which underscore questions about the uncertainty of the representativeness of the data.

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58 S. BELENKO & I. MARA-DRITA, *supra* note 11, at 2.

59 Smith, *supra* note 6.

60 Rearrest data were not made available to Belenko and Mara-Drita.

TABLE 1
COMPARISON OF BELENKO AND MARA-DRITA (1988) AND SMITH *ET AL.* (1989) SAMPLE TOTALS

Sample stage	Belenko and Mara-Drita	Smith et al.
Target population of arrestees	n/a	n/a
Total approached for interview	6,187	6,056
Agreed to interview	5,747	5,747
Drug tested	4,847	4,847
Disposed at arraignment	1,472	n/a
Eligible for release	4,706	2,919
Minus missing data	n/a	2,606
Released (post-arraignment)	3,462	n/a
Released with test results (final sample)	2,645	1,967

Smith *et al.* reported that ninety-five percent of the 6,056 arrestees contacted at booking (or 5,747 arrestees) agreed to be interviewed, and that 4,847, or eighty percent were drug tested.[61] They further note that 2,919 were eligible for release (or forty-eight percent of those contacted), but that drug test data were available for only 2,606. They further state that 1,967 of these (or seventy-five percent of those with data and sixty-seven percent of what they refer to as "eligible" releasees) had drug testing information permitting them to be included in the analyses of releasees. This amounts to 543 fewer arrestees released and 678 fewer arrestees released having drug test results than Belenko and Mara-Drita counted and employed in their analyses of failure-to-appear. Such discrepancies are problematic for interpretation of the results.

Smith *et al.* reported results of multivariate analyses that adjust for selection bias which, they argue, results from defendants being screened out of the release sample by pretrial detention.[62] Specifically, Smith *et al.* argue that an analysis of pretrial misconduct normally is based on a biased sample of defendants because some presumably higher risk defendants are detained, thus being screened from the analysis. According to this logic, because risk-related attributes of defendants are influential in the selection of the sample (causing higher risk defendants to be confined), analysis of defendant misconduct without adjusting for this screening process will result in inaccurate findings. Using censored probit, Smith *et al.*,[63] therefore, seek to model defendant misconduct conditioned on the likelihood of being excluded from the sample (being detained).

61 Smith, *supra* note 6, at 108, Table 1.

62 For a more thorough discussion of this argument, see *infra* section VI.

63 Smith, *supra* note 6, at 103-07.

Aside from the emphasis on selection bias, the goals of their analyses are similar to those noted above in earlier studies.

Considering the effects of twenty-five potential independent variables and five variables measuring drug test results in censored probit analyses, Smith *et al.* examined failure-to-appear and rearrest separately. In the analyses of FTA, they found significant effects for thirteen of the twenty-five non-drug test measures on the likelihood of flight.[64] Primary among these independent variables were the pretrial services recommendation for pretrial release and the presence of charges for drug offenses (having drug charges was related to a lower likelihood of FTA).[65] When the number of positive tests for illicit drugs was added, a significant but not powerful effect was found. The addition of drug-specific test results did not figure significantly into the final model of failure-to-appear.

In the Smith *et al.* analysis of rearrest among released defendants, twenty-five independent variables and drug test results were again considered. However, another variable was added—a measure of the length of time a defendant was free prior to adjudication. The addition of this variable shifted the nature of the analysis in an important way. The variable is problematic because the task of prediction is to project the likelihood of pretrial misconduct based on information available at the time of the prediction (or, in advance of pretrial release). The length of time a defendant subsequently might be at-risk during the pretrial period would be unknowable in advance. The inclusion of the variable is also problematic for a second reason. One could convincingly argue that, in part, "time-free" is information tied into the dependent measure of misconduct and, thus, is part of the prediction that is being made.[66]

Of the twenty-five independent variables considered in the analysis, ten are included in the final model fitting defendant rear-

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64 *Id.* at 114.

65 We have argued in the past that, rather than viewing pretrial service recommendation as information in themselves (*i.e.*, as independent variables) in predictive analyses, it may be more appropriate to view them as a decision made on the basis of available information about the likely risk of defendants reaching the bail stage (*i.e.*, as dependent variables). J. GOLDKAMP & M. GOTTFREDSON, POLICY GUIDELINES, *supra* note 24. Using that perspective, it would not be appropriate to include this variable in analysis designed to identify predictors of flight and crime.

66 That is, to the extent that released persons commit crimes that occur during the pretrial period for which they are rearrested, and to the extent that the rearrests occur in advance of the conclusion (through adjudication) of the original charge, time-free will be a function of misconduct, the behavior that bail decisions try to predict. Smith *et al.* argued against including this variable in the analysis of FTA, but viewed it as appropriate in the analysis of rearrest. Smith, *supra* note 6, at 115 n.14. They did not provide a reason for a shift in this reasoning as it applies to the rearrest analysis.

rest (including the natural log of the number of days the defendants were free). When added to the pool of variables, the number of positive drug tests again contributes significantly to the model (as in a separate analysis, one drug-specific test result for PCP also does).

II. The Design of the Research in Dade County

The principal objective of the research undertaken in Dade County, Florida, was to determine whether some of the findings produced in the earlier studies—concerning the importance of drug testing information in the context of the bail/pretrial release decision—could be replicated in a very different setting, namely, among felony defendants in Dade County, Florida. As we explained above, prior researchers have argued that knowledge of a defendant's current drug use—as established through a program of drug testing prior to the defendant's first appearance—provided the court with information that was related powerfully to defendants' subsequent chances of flight or crime during a period of pretrial release, above and beyond the already routinely available information about the defendants or their cases.[67]

Though sharing the main goals, our research differed from the New York and District of Columbia studies in important ways. Unlike the District of Columbia study, we did not evaluate a program of drug testing that was already in effect in an actual court system. Instead, we sought to assess the utility of drug testing at the post-arrest stage without actually implementing a program. Unlike the New York study, we conducted the study as part of a larger effort to develop a decision-making resource for the criminal court to review and improve bail and pretrial release decision-making. The Dade County arrestees were tested voluntarily prior to the bail (bond hearing) stage on the specially agreed conditions that (1) the results of the tests could not be made available to any official agency for dispositional purposes; and (2) anonymity and confidentiality in the process would be guaranteed. Thus, although the judges, by agreement, could not use the urinalysis results we collected in their decision-making, we nevertheless asked the question: "Compared to what the system is doing now and based on the information it has at hand, what difference would drug test results make in bail/pretrial release decision-making?" We employed this approach because the Dade County court system had reservations not only about the utility but also about the desirability of drug testing. Thus, we struc-

67 In particular, see A. Yezer, Periodic Urine Testing, *supra* note 11; A. Yezer, The Efficiency of Using Urine, *supra* note 11.

tured the research to address these questions in advance of a decision to implement a program derived from the District of Columbia-like prototype. Accordingly, our research was intended to investigate a number of key, empirically testable questions that would inform the debate—in Dade County and elsewhere—about drug testing as a criminal justice tool at the pretrial release stage.

A. DESIGN OF THE STUDY: THE DADE COUNTY SITE AND SAMPLE

The choice of Dade County as a research site offered an opportunity to "piggy-back" data collection so that a large, comprehensive data set could be obtained at minimal expense. The sampling strategy employed in this study was tied closely to the approach followed in the evaluation of the Circuit Court's initial use of the bond hearing guidelines that were developed after two years of research and debate.[68]

The decision to rely on the already designated sampling approach carried with it certain limitations. Because our research focused on felony defendants at the first judicial stage (*i.e.*, the bond hearing) in Circuit Court, the results we describe are not representative of all arrestees. Thus, we did not include some persons who were arrested, but made bond via the bond schedule at the booking stage within the first few hours. The sample does, however, represent all defendants reaching the bond hearing stage (*i.e.*, all felony defendants for whom judges would be deciding bail/pretrial release during June and July, 1987). It can be argued that, because the drug testing questions refer to defendants about whom judges would be making decisions at the bail stage, this limitation is not a relevant one and in no way limits the conclusions that may be drawn about the role of drug testing regarding the bail decision. Our study included only "bondable" defendants: we targeted only decisions made by judges involving defendants who had some chance of pretrial release. Thus, defendants charged with capital offenses, offenses punishable by life imprisonment, or any other categories held

68 For a discussion of the development and evaluation of bail/pretrial release guidelines and the research methodology in Dade County, see J. GOLDKAMP & M. GOTTFREDSON, BAIL AND PRETRIAL RELEASE GUIDELINES, VOL. I, *supra* note 24; and J. GOLDKAMP, M. GOTTFREDSON & P. JONES, BAIL AND PRETRIAL RELEASE GUIDELINES, VOL. II, *supra* note 24. This linkage occurred, for the purposes of evaluating the guidelines in Dade County, because plans had been formulated to collect data describing a large prospective sample of felony defendants (n=2,995) entering the judicial process at the first stage (bond hearing) during June and July of 1987. The actual dates of the sample period were between June 9, 1987 and July 24, 1987. Rather than duplicating resources for data collection, the authors decided to use the guidelines sample of defendants as a base and to add data reflecting drug test results.

to be non-bondable crimes under Florida law were excluded.[69]

Under other circumstances, it might have been preferable to test a random sample of defendants from the entire year of 1987, rather than a total sample of bond-hearing bound June-July defendants. However, because of the expense and difficult logistics involved in collecting and testing urine specimens, project resources could not have sustained a year-long effort of staffing and testing. Thus, to the extent that June-July felony defendants might differ from defendants entering the court during other months, the findings might be limited only to the sampling period. As patterns of trafficking change and affect the availability and use of different kinds of drugs in different locations, such a concern might become relevant.

As has been long noted,[70] all predictive studies in this area suffer from the limitation that not all defendants are released before trial (thus ruining the chance for the perfect, "natural" experiment).[71] Logically, in obtaining urine specimens from defendants shortly after the arrest stage, it was not possible to know in advance which defendants would not be released. Approximately twenty-eight percent of our designated sample did not gain pretrial release within ninety days after arrest; after ninety days of incarceration without release, a defendant was designated as "detained" for the purposes of the study. In addition, because the arrestees voluntarily provided urine specimens in the Dade County jail, like the other studies, our sample did not include one hundred percent of targeted defendants. Table 2 summarizes the derivation of the sample employed in this study. Our approach in the jail was to explain to de-

69 For a more thorough analysis, see the discussion of the sample composition in J. GOLDKAMP, M. GOTTFREDSON & P. JONES, BAIL AND PRETRIAL RELEASE GUIDELINES, VOL. II, *supra* note 24. The following offenses listed under the Florida penal code are not bondable at the first judicial stage: attempt or solicitation for capital felony with a firearm, FLA. STAT. ANN. § 775.087 (West Supp. 1990); possession of a bomb or explosive device, *id.* § 790.161; burglary or breaking and entering, armed, *id.* § 810.020; burglary with assault, *id.* § 810.020; forcible rape, *id.* § 794.021; kidnapping for ransom, *id.* § 805.020; kidnapping, *id.* § 787.01; murder in the first and second degree, *id.* § 782.040; rape, *id.* § 794.010; robbery using firearm/deadly weapon, *id.* § 812.130; sexual battery by threats, *id.* § 794.011; sexual battery on minor by adult, *id.* § 794.011; sexual battery on minor by minor, *id.* § 794.011; and sex offenses. *Id.* § 794.021.

70 *See, e.g.*, Gottfredson, *An Empirical Analysis of Pretrial Release Decisions*, 2 J. CRIM. JUST. 287 (1974).

71 Ideally, of course, the perfect predictive study would use a total sample of defendants entering the criminal process, all of whom would (a) provide urine specimens for drug testing and (b) gain pretrial release. All defendants could then be tracked to learn of failures-to-appear and rearrests during pretrial release. "Predictors" of pretrial flight and crimes would be identified through statistical analysis of factors differentiating the "failures" from defendants not engaging in misconduct.

fendants the purposes of the research, to assure them that the test results could not be employed by the system to affect their status, and to inform them that participation was voluntary. Our sample therefore was further limited by the refusal rate of defendants who did not wish to or who could not provide a specimen. Our refusal rate, about twenty-one percent of the designated (and reachable) defendant sample, compares with the average usually experienced where participation has been voluntary.[72]

Table 2 also outlines other (sub-) samples that were determined based on cost considerations. Planning in advance on some rate of non-participation, our goal was to have a sample of about 2,000 tested defendants to study. We began the data collection by submitting the specimens of the first 190 defendants in our sample for testing at the local Metro-Dade County Criminal Justice Coordinating Council's lab (Forensic Toxicology Services), which employed the Roche-based RIA screening procedures for seven categories of drugs and for alcohol. One of the reasons for reviewing the initial test results was to learn whether it was fruitful to test for all possible drugs or whether, given the expense involved, it would make better sense to narrow the focus to a few of the substances, the use of which were likely to be prevalent among defendants. In addition, this allowed us to check that our procedures (including urine collection, transmission to the lab, and processing) were working in a reasonable fashion. As a result of our initial tests, we determined that only marijuana and cocaine tests were showing positively in any

72 In J. GOLDKAMP, M. GOTTFREDSON & P. JONES, BAIL AND PRETRIAL RELEASE, VOL. II, *supra* note 24, at Appendix B, we compared the characteristics of defendants and their cases in the original guidelines samples, the designated drug testing sample, and the defendants actually tested and not tested. We concluded that the sample had not been noticeably biased for the purposes of this research. The sample actually studied was several hundred cases smaller than the guidelines study sample for two reasons related to the logistics of specimen collection upon which our study depended. First, in order to staff a urine specimen collection approach in the very large Dade County jail around the clock—so that we could try to obtain specimens for all defendants in our guidelines sample—close coordination with other jail functions had to be maintained. Because we did not have enough funding or staff merely to test all arrestees entering the jail, we were required to focus on defendants likely to go to the bond hearing—and to ignore those likely to achieve booking stage release. Not only was it difficult to tell the difference between the two groups in advance, but urine collection had to occur while the inmates were in a particular location where they were held before the bond hearing. On days when back-ups occurred in processing, we often faced the task of trying to collect specimens of very large numbers of defendants during very short periods of time. Other times, sudden changes in jail routine, often related to jail crowding, made it impossible for us to have the opportunity to collect the required specimens. These kinds of logistical problems—on days when particular shifts or entire days were not available to us—meant that we could not reach approximately 429 of the 2,995 defendants targeted in the guidelines sample.

TABLE 2

SUMMARY OF DEFENDANT SAMPLES EMPLOYED IN STUDY

Sample	Total pool	Designated cases	Specimens obtained	Specimen QNS[a] or missing in lab	Not tested (refused, etc.)
All bond hearing defendants[b]	2,995	2,566	2,019	95	547
Defendants on days 70% or more	2,609	2,186	1,826	1	360
First 200[c] (August pretest)	2,019	200	190	0	N/A
Seven drugs[d]	2,019	300	359[e]	11	N/A
Three drugs (alcohol, cocaine, marijuana)	2,019	2,019	2,019	95	N/A
Opiates (extra from EMIT)	2,019	295	295	0	N/A
Split specimens					
Overall	2,019	58	58	2	N/A
First 200 (pretest)	2,019	6	6	0	N/A
EMIT (retest)	2,019	33	33	1	N/A
Retested specimens					
EMIT	2,019	295	295	0	N/A
GCMS		161	161	15	N/A
Batch 1 only positive RIA results confirmed	—	85	85	14	N/A
Batch 2 - all RIA results confirmed	—	76	76	1	N/A

[a] "Quantity not sufficient" and missing may vary between test samples.
[b] Defendants entering system between June 9 and July 24, 1987 (guidelines sample).
[c] Tested using RIA in Dade lab for seven drugs (marijuana, cocaine, PCP, opiates, amphetamines, benzodiazepines and barbiturates) and alcohol.
[d] Tested using RIA in Dade lab—a retest of the first 200 samples—and at Roche using RIA for marijuana, cocaine, PCP, opiates, amphetamines, benzodiazepines and barbiturates.
[e] The "middle" 100 cases of the total sample were selected to be tested on all seven drugs. The laboratory inadvertantly tested additional specimens.

number, and decided only to test for those two drugs and alcohol for the entire 2,000 defendant sample.[73] To verify that the marijuana-cocaine pattern applied throughout the entire sample period, we tested for all drugs again on a later sub-sample of 175 cases, finding essentially similar results.[74]

[73] We hoped that this would allow us to save some resources for confirmation testing for a small number of specimens without weakening the investigation of the drug-pretrial crime relationship in a meaningful manner.

[74] As Table 2 shows, of those specimens submitted to the lab for testing, roughly 8%

B. SUB-SAMPLES FOR RETESTING: SPLIT SAMPLES, EMIT, AND GC/MS

We randomly selected fifty-eight specimens to be split into two parts, so that we could measure the reliability of testing by comparing the results for each half. The "splits" were assigned improvised identification numbers, and the lab was not informed of their linkage (although the lab was aware that we would be submitting splits blindly from time to time). In addition, 295 specimens were sent to a second lab (at the District of Columbia Pretrial Services Agency) for retesting using a different technology (EMIT). Some of those cases were also split samples. Finally, we selected two groups totalling 161 specimens to be retested—using two approaches (one for screening and confirming, one for confirming specimens presumed already to be screened positive)—employing gas chromatography/mass spectometry (GC/MS) at the Roche lab.

III. MEASURING DRUG USE AMONG DADE COUNTY FELONY DEFENDANTS: THE PREVALENCE OF USE AND THE ACCURACY OF TESTS

A basic goal of the study was to test a sufficiently large sample of defendants for a wide variety of drugs to facilitate the empirical analysis of rearrest and failure-to-appear among released felony defendants. At this stage, the research sought to determine the prevalence of use among Dade felony defendants of the following kinds of substances: marijuana, cocaine, PCP, opiates, barbiturates, amphetamines and benzodiazepines (a class of drugs including valium and related substances). In addition, it was a goal of the research to test for the presence of alcohol, given the now often overlooked but lengthy literature relating alcohol use to crime, even though urine-based alcohol tests were known by us to be inferior to breath and blood testing.[75] The study employed Roche's RIA drug screening technology as conducted by the Forensic Toxicology Services laboratory of the Office of the Dade-Miami Criminal Justice Council for the first three-fourths of the tests. The study used the Roche labs for the final specimens.

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were either deemed "quantity not sufficient" at some stage or were not accounted for by the lab.

75 *See* R. HAWKS & C. CHIANG, URINE TESTING FOR DRUGS OF ABUSE 103-04 (Research Monograph No. 73, 1986) (prepared for Nat'l Inst. on Drug Abuse, U.S. Dep't of Health and Human Services) [hereinafter R. HAWKS & C. CHIANG, URINE TESTING]. In fact, the results generated for alcohol use by means of the acid potassium dichromate dip screening test and a gas chromatography confirmation were of questionable value. The positive rate for alcohol among defendants using this method was so low as to be unbelievable; thus, we mention the results and drop alcohol use from the analysis.

When defendants were tested for all eight substances—the two comprehensive testing periods occurred roughly between cases 1 and 190 and later between cases 1500 and 1675 of the 2,019 defendant sample—the overall picture of results changed little.[76] Clearly, of the substances we were able to measure, cocaine, marijuana, and alcohol were employed most commonly by criminal defendants. Positive tests for other kinds of drugs were rarely in evidence and can be assumed not to have been widely prevalent among the defendant population in Dade County during the summer of 1987.

We conducted focused testing on the entire sample of 2,019 defendants. Only about fourteen percent of all defendants tested were reported as testing negatively on all three of these substances. Because of the relative scarcity of positive tests for alcohol (and the questions about the reliability of the urine test used to test for alcohol), the subsequent testing was focused mainly on the presence of metabolites of two drugs, cocaine and marijuana (THC). The results of drug tests for those tested (n=1,861) are depicted in Figure 1. When only tested defendants are considered, as few as nineteen percent of felony defendants tested negatively for the presence of drug metabolites in their urine; the bulk of the positive tests were accounted for by marijuana, cocaine or both kinds of metabolites. Overall, roughly seventy-four percent of entering felony defendants (who were tested) tested positively for cocaine; about forty-four percent tested positively for THC (marijuana). About eighty-one percent tested positively for either one or the other drug; thirty-eight percent tested positively for both drugs.[77] When contrasted with the findings from the New York City and the District of Columbia research, the Dade County felony defendants showed a higher level of positive tests and a more homogeneous pattern of drug use.[78]

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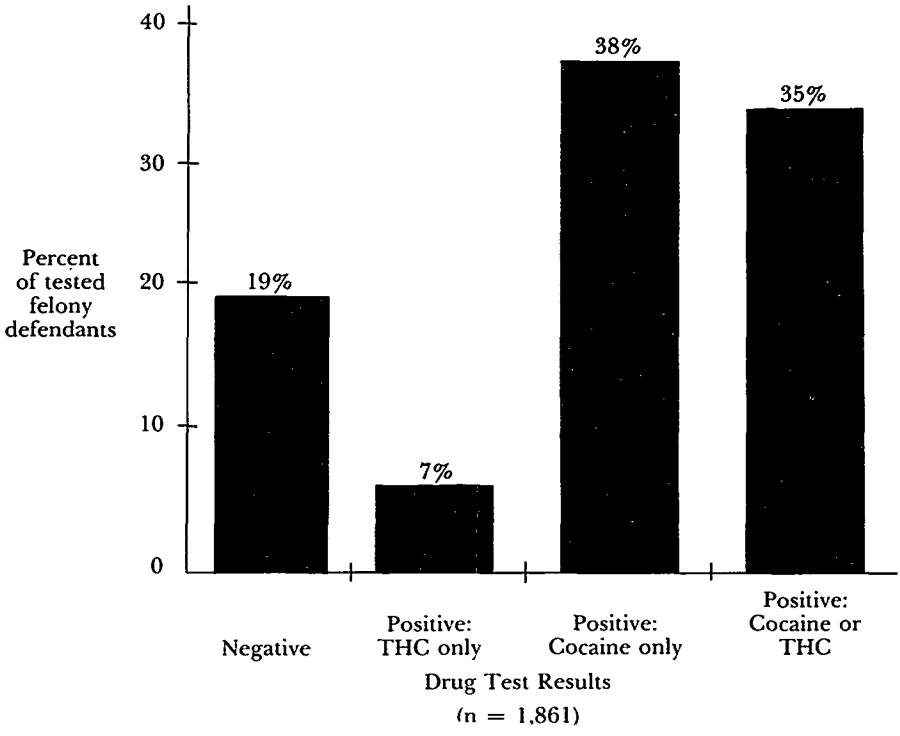
[76] When the first 190 cases were tested for eight substances, we obtained the following results: 7% tested positively for alcohol; 42% for marijuana; 69% for cocaine; less than 1% for PCP; 0% for amphetamines; 1% for barbiturates; 2% for opiates; and 4% for benzodiazepines. When we selected 175 cases occurring much later in the study to test comprehensively, the pattern of results was pretty much the same, except with a higher percentage testing positively for cocaine: 3% tested positively for alcohol; 45% for marijuana; 92% for cocaine; 0% for PCP; 0% for amphetamines; 1% for barbiturates; 2% for opiates; and 2% for benzodiazepines.

[77] Recall that about 22% of the full sample of entering defendants did not provide specimens, for one reason or another. *See supra* text accompanying note 71.

[78] In the District of Columbia study, *supra* notes 48-54 and accompanying text, 53% percent tested positively, with large proportions for cocaine and for PCP. In the New York study, *supra* notes 55-58 and accompanying text, 42% of the sample tested positively, with cocaine use predominant but with noticeable proportions of positive tests for opiates.

FIGURE 1

DRUG TEST RESULTS AMONG TESTED FELONY DEFENDANTS, DADE COUNTY CIRCUIT COURT, JUNE-JULY, 1987



A. THE ACCURACY OF DRUG TEST RESULTS (I): RELIABILITY

The "accuracy" of drug test results raises important issues both for the fairness of the applications of drug testing (in criminal justice and elsewhere) and for the interpretation of empirical results. Accuracy questions may be subdivided into two categories: questions of reliability (accuracy as the consistency of measurement) and questions of validity (accuracy as the extent to which tests really measure the presence of the substance). Reliability can be measured in a variety of ways when a specimen has been tested more than once. For example, when the same technology measures the same specimens a second time, comparison of the results over the two times is one test of reliability. Multiple measuring was done in a number of ways in this study.

1. Splitting of Specimens: Comparing Results of Split Samples Submitted Blindly to the Testing Lab

One procedure involved the splitting of a small sub-sample of

specimens (roughly one in every forty) into two parts, followed by the "blind" submission of both parts to the testing lab.[79] Later, we compared the results for each of the related "splits" to see if they had been tested at similar levels. To the extent that the test results were the same for both "splits," testing would be seen to be reliable in the sense of scoring the same real specimen similarly over two tests.[80] Overall, of the fifty-eight specimens that were split and treated as if they were contributed by 116 defendants, we had results for all tests on the two splits to compare in forty-five actual cases. Table 3 shows the rate of disagreement in test results between the two parts of the original specimens for alcohol, marijuana and cocaine:

2. *Retesting of the Specimens of the First 200 Defendants*

The purpose of the research was to learn what difference drug testing information might have made had it actually been available in practice. In a sense, then, the research was a "dry run" in which actual individuals could not be adversely affected. The malfunction that produced erratic results in the first 200 cases would not have been detected except for the splitting procedures employed by the researchers. Thus, the results would have been employed as relia-

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79 The RIA screening technology produces "semi-quantitative" scores in nanograms per milliliter (ng/ml) of the drug metabolites in urine specimens. By falling above or below certain standard "cut-offs" for each kind of test, scores classify specimens as positive or negative. In our measure of reliability, we compare only whether specimens were rated as positive or negative. We did not compare the actual ng/ml readings. Our rationale is that jurisdictions engaged in drug testing would regard defendants as negative or positive based on the cutoffs, not on the actual scores obtained.

80 We learned the importance of this kind of check on the quality of testing in examining the results of our first 200 specimens (recall that it was through study of the first 200 that we were able to plan the remainder of our testing strategy). Of the 5 pairs of splits included in the first 200 results (we split every 40th specimen), 4 pairs showed inconsistent results on at least one drug test. Alcohol test results were inconsistent for 1 of the 5 pairs of specimens. Cocaine results were inconsistent in 2 of 5 cases. Benzodiazepine and THC results were inconsistent in 1 of 5 pairs. PCP, barbiturate, amphetamine and opiate results were consistent in all 5 pairs. Given that it would take a positive on any one of the tests to result in a defendant being rated as testing positively in a court program, this rate of inconsistency was certainly troubling. As a consequence of these early readings, the Criminal Justice Coordinating Council lab detected a malfunction in the testing equipment that normal quality control procedures had not been able to detect. (After correcting the problem, all 200 specimens were retested—giving us another reliability check). Another result of this process—the retesting of the first 200 specimens—was that a number of small-quantity specimens was consumed and now turned up as "QNS" (quantity not sufficient for analysis). This result contributed to the overall 8% missing information we noted in our description of the sample. Once lab procedures were corrected and the testing of specimens started from the beginning again, the submission of blind "splits" along with all other specimens for testing to the lab continued throughout the study.

TABLE 3
AGREEMENT IN RIA TEST RESULTS BETWEEN (RE-PAIRED) SPLIT SPECIMENS

Test results (second half sample)	Test results (first half sample): Negative	N	Percent	Test results (first half sample): Positive	N	Percent
Negative	Alcohol	32	91.4	Alcohol	0	0
	Marijuana	21	46.7	Marijuana	1	2.2
	Cocaine	3	6.7	Cocaine	4	8.9
	Agreement			Disagreement		
Positive	Alcohol	3	8.6	Alcohol	0	0
	Marijuana	7	15.6	Marijuana	16	35.6
	Cocaine	4	8.9	Cocaine	34	75.6
	Disagreement			Agreement		

	Total N	Rate of disagreement
Alcohol	35	8.6
Marijuana	45	17.8
Cocaine	45	17.8

ble information, had the testing not been just for research purposes. The difference this might have made is seen when the first results of the first two hundred defendants are compared to their second results: one percent showed different alcohol results; fifteen percent showed different marijuana results; and twenty-eight percent showed different cocaine results between the two test cycles.

3. Comparing Results When Specimens Already Tested by the Dade County Lab Were Tested by Roche

To expedite completion of the testing of the 2,000 defendant specimens, a number of specimens were sent to the Roche labs for RIA screening. Inadvertently, nine specimens sent to Roche had been tested already but were tested again by Roche, thus providing a chance to compare the consistency of RIA results. On the marijuana test, four specimens were identified as positive by both labs and four were identified as negative by both labs. One was rated as positive by the toxicology lab and negative by the Roche lab, representing a disagreement rate of eleven percent. Eight specimens were tested for cocaine by both labs; both labs found all eight to be

positive for cocaine, representing a disagreement rate of zero percent.

4. Inter-Technology Reliability: Using Both RIA and EMIT Procedures

Through an agreement with the District of Columbia Pretrial Services Agency, we shipped 328 specimens (of which thirty-three were split part-specimens and 295 were normal specimens) that had been tested using Roche RIA technology in Miami to be retested using the EMIT technology, which is used more commonly in criminal justice settings. The goal was to learn whether both technologies would test a given sample of specimens with the same screening results. Assuming both were "correct," we sought to learn whether different technologies using different "cutoffs" would classify defendants differently. Interpretation of the results of this comparison, however, was hampered because we did not know whether to interpret inconsistencies in results between testing approaches as attributes of the particular technologies or to the fact that one lab was making "mistakes."[81]

TABLE 4

AGREEMENT IN SCREENING RESULTS BETWEEN RIA AND EMIT

		RIA Results: Negative			RIA Results: Positive		
			N	Percent		N	Percent
EMIT Results: Negative		Marijuana	158	53.9	Marijuana	13	4.4
		Cocaine	72	24.6	Cocaine	18	6.1
		Agreement			Disagreement		
			N	Percent		N	Percent
EMIT Results: Positive		Marijuana	4	1.4	Marijuana	118	40.3
		Cocaine	4	1.4	Cocaine	199	67.9
		Disagreement			Agreement		

	Total N	Rate of disagreement
Marijuana	293	5.8
Cocaine	293	7.5

81 For this reason, we also sent split specimens to the D.C. Pretrial Services lab. We would assume the lab scoring best on split comparisons to be the most reliable—although we still would not be able to determine if any unreliability was because of human or technological processing factors.

The RIA tests had found forty-four percent of defendants positive for THC metabolites and fifty-six percent negative. EMIT tests found forty-two percent positive and fifty-eight percent negative. Table 4 shows that about six percent of the specimens were screened differently by the two techniques for marijuana. When testing for metabolites of cocaine, RIA tests found seventy-four percent of the sample positive and twenty-six percent negative. EMIT tests found sixty-nine percent positive and thirty-one percent negative. Overall, seven percent of defendants were screened differently for cocaine by the two technologies.

5. *The Intra-Technology Reliability of EMIT and RIA: Comparison of the Processing of Split Specimens*

Among the specimens sent to be retested using the EMIT technology in Washington, D.C., there were eighteen split specimens, or thirty-six specimens in all (parts of several more were rendered useless during shipping). When splits among EMIT tests were compared, we learned the following: EMIT marijuana results in one of the eighteen cases (re-paired splits), or six percent, did not agree. In earlier testing, RIA results did not agree in eight of forty-five, or eighteen percent, of the cases. EMIT cocaine results in two of the eighteen cases, or eleven percent, did not agree, compared with an earlier RIA disagreement rate of eight of the forty-five, or eighteen percent, of cocaine results.

From these two kinds of comparisons, we draw two inferences. First, although the two kinds of technologies tested the sample specimens very similarly, in a small percentage of instances the classification of defendants as positive or negative for particular drugs disagreed. Second, EMIT, which tested the splits slightly more consistently, classified defendants positively somewhat less frequently than RIA.

B. THE ACCURACY OF DRUG TESTS (II): VALIDITY

One of the greatest fears associated with the establishment of drug testing programs is the belief that, despite manufacturer claims of accuracy, persons mistakenly will be classified as drug users who are not (*i.e.*, "false positives"). Conversely, some drug abusers incorrectly will be identified by the tests as non-drug abusers (*i.e.*, "false negatives"). Drug testing at the bail stage of the criminal process differs from drug testing in other settings because of the short period of time between the collection of the arrestee's urine specimen and the first stage at which the test results are made available to

the court. This short "turnaround" time means, for one thing, that more time-consuming but more accurate confirmation procedures cannot be conducted, at least not on a routine basis. As a result, a less costly and quicker screening technology, for example, the EMIT system in the District of Columbia, is used.[82] Screening—as opposed to confirming—tests are more general in their detection capacities and provide a less sensitive, semi-quantitative measure of the amount of drug present in urine. Although there is debate about the exact level of accuracy associated with screening tests, it is argued to be very high.[83] Normally, professionals in the field recommend that screening test results be repeated (confirmed) on the more accurate gas chromatography/mass spectometry ("GC/MS") technology in situations where positive test results can have serious implications for the person tested (*e.g.*, when employment or military service can be terminated);[84] however, this is seldom practical in criminal justice settings, particularly at the bail stage. Instead, screening tests may be repeated and the urine may be saved for later confirmation, in the event that the results are contested.

Thus, in contrast to accuracy concerns tied to the reliability of testing, other questions have been raised concerning the validity of drug testing, including how well it measures actual levels of drug metabolites in the urine. In short, how often are test results "wrong"? We attempted to assess the validity of drug testing (the degree to which "false negatives" and "false positives" were produced) by confirming the screening test results using GC/MS.[85]

1. Confirmation of Screening Results Using Gas Chromatography/Mass Spectometry (GC/MS)

RIA and EMIT technologies are "screening" tests used to identify the presence or absence of drug metabolites in the urine. As such, they are designed to eliminate specimens failing to score above a standard cutoff (the "negatives"), and to mark for confirmation testing those with scores above the cutoff (the "positives"). Confirmation testing, because of its greater sensitivity and specific-

82 Several screening technologies are available, including radioimmunoassay and enzyme immunoassay. *See* R. HAWKS & C. CHIANG, URINE TESTING, *supra* note 74.

83 For a discussion of the relationship between accuracy and sensitivity, see Council on Scientific Affairs, *Council Report: Scientific Issues in Drug Testing*, 257 JAMA 3110 (1987).

84 *See, e.g.*, Council on Scientific Affairs, *supra* note 83, at 3113; Blanke, *Quality Assurance in Drug Testing*, 33 CLINICAL CHEMISTRY 416 (1987); DEPARTMENT OF HEALTH AND HUMAN SERVICES, ALCOHOL, DRUG ABUSE & MENTAL HEALTH ADMIN., MANDATORY GUIDELINES FOR FEDERAL WORK PLACE DRUG TESTING PROGRAMS (1988).

85 Of course, in this analysis, we assume that the accuracy of GC/MS is so great that, compared to the screening technologies, GC/MS will nearly always be "right."

ity, looks for positive results at a much lower level. For example, while RIA scores a specimen as positive for THC at a cutoff of 100 ng/ml or higher, GC/MS will confirm the specimen as positive at a level of 15 ng/ml or higher. GC/MS is the preferred confirmation technology, although its prohibitive expense makes routine use in criminal justice settings impractical.[86]

Within our resource constraints, we attempted to investigate the problems of both false positives and false negatives in drug testing through the GC/MS testing of two small sub-samples of defendant specimens.

a. False Positives in Drug Testing: What Happens When Specimens "Screened" as Positive by RIA Are "Confirmed" Using GC/MS?

It is unlikely that testing programs using either RIA or EMIT screening technologies will also confirm results through GC/MS testing before using the test results in the bail decision. Therefore, we sought to learn the difference that knowledge of confirmation test results might have made in the classification of defendants as "positive" drug users had that technology been available. To answer this question, we sent eighty-five specimens to the Roche lab for RIA screening, and then sent those with positive scores for marijuana or cocaine for confirmation testing with GC/MS.

Marijuana results: of eighty-three specimens with sufficient quantity to test, thirty-five (or forty-two percent) were classified by RIA screening as presumptively positive for marijuana. When these presumed positives were confirmed using GC/MS, eleven percent were tested as negative.

Cocaine results: seventy-eight of eighty-three of the specimens (or ninety-four percent) tested by RIA screening for cocaine metabolites in the urine as positive. When these presumed positives were confirmed using GC/MS, thirteen percent tested negatively.

b. False Positives and False Negatives: What Happens When Both Negative and Positive Screening Results Are Confirmed Using GC/MS?

Advocates of drug testing believe that its value lies in the identification of drug using offenders whose drug abuse signals a higher likelihood of criminal activity. Thus, in addition to worries about

86 In drug testing programs based on the D.C. approach, defendants are often considered positive—or considered presumptive drug users—if their specimens have been screened positive using EMIT twice. Confirmation testing is not carried out because of both the quick turnaround required and the great expense that would be entailed.

the misclassification of non-drug using arrestees as drug users, it would be appropriate to learn the extent to which screening tests also misclassify defendants as non-drug users who in fact are drug users. To evaluate the occurrence of both false negatives and false positives, we submitted seventy-six specimens, which had been screened using RIA at the Dade County lab, for retesting through GC/MS at the Roche facility. This time, however, without communicating the actual RIA screening results, we asked that all specimens be tested for cocaine and marijuana (*i.e.*, we informed them that all RIA results were positive and needed confirmation). (See Table 5.)

TABLE 5

FALSE POSITIVES AND FALSE NEGATIVES: CONFIRMATION OF RIA SCREENING TEST RESULTS BY GC/MS

GC/MS Confirmation	RIA Screening: Negative			RIA Screening: Positive		
		N	Percent		N	Percent
Negative	Marijuana	36	49.3	Marijuana	3	4.1
	Cocaine	9	12.2	Cocaine	2	2.7
	True Negatives			False Positives		
		N	Percent		N	Percent
Positive	Marijuana	2	2.7	Marijuana	32	43.8
	Cocaine	13	17.6	Cocaine	50	67.6
	False Negatives			True Positives		

	Total N
Marijuana	73
Cocaine	74

Marijuana results: Earlier RIA screening had found that forty-seven percent were positive for marijuana and fifty-three percent were negative. Re-testing by GC/MS found a similar proportion positive (forty-eight percent) and negative (fifty-two percent). However, roughly seven percent were classified differently under GC/MS: nine percent of defendants classified as positive by RIA screening were scored as negative by GC/MS; and, five percent of those screened as negative under RIA were scored as positive by GC/MS. In short, four percent of all tested were screened as positive when they were negative; three percent of all tested were screened as negative when they were positive.

Cocaine results: The results for cocaine were more striking. RIA had

screened fifty-two of the seventy-four defendants (seventy percent) as positive for cocaine. GC/MS, in contrast, found sixty-three (eighty-five percent) to test positively. Four percent of those scored as positive by RIA were negative according to GC/MS; fifty-nine percent of those testing negatively according to RIA were positive according to GC/MS. Thus, three percent of all tested defendants were screened as positive by RIA when they were negative; eighteen percent of all defendants tested were negative under RIA when they were in fact positive under GC/MS.

IV. The Correlates of Defendant Misconduct During Pretrial Release

As stated earlier, the principal aim of this study is to learn whether, beyond the power of information currently available to a judge making a bail/pretrial release decision, the knowledge of drug test results would contribute valuable predictive data. By using attributes related both to pretrial release outcomes and drug test results as controls in multivariate analyses, and by holding constant the effects of other correlates of misconduct, we can determine whether drug test data offer additional or, as a prior researcher states, "incremental," predictive power.[87]

Our analysis of defendants' performance can only focus on the seventy-seven percent of the sample who successfully secured release (within ninety days of booking) before adjudication of their cases.[88] We followed felony defendants released before trial for a period of ninety days or until the adjudication of their cases, whichever came first, to observe their record of performance during pretrial release. We measured defendant misconduct in three ways: first, as failure to appear in court (FTA); second, as rearrest for crimes committed during pretrial release; and third, as rearrest for serious crimes against the person[89] committed during the pretrial period. Each dependent variable was measured as dichotomous for the purposes of this analysis.

Figure 2 exhibits the rate and kinds of defendant misconduct recorded by felony defendants securing release in our sample. (Refer to the left-most column where the sample totals are indicated.)

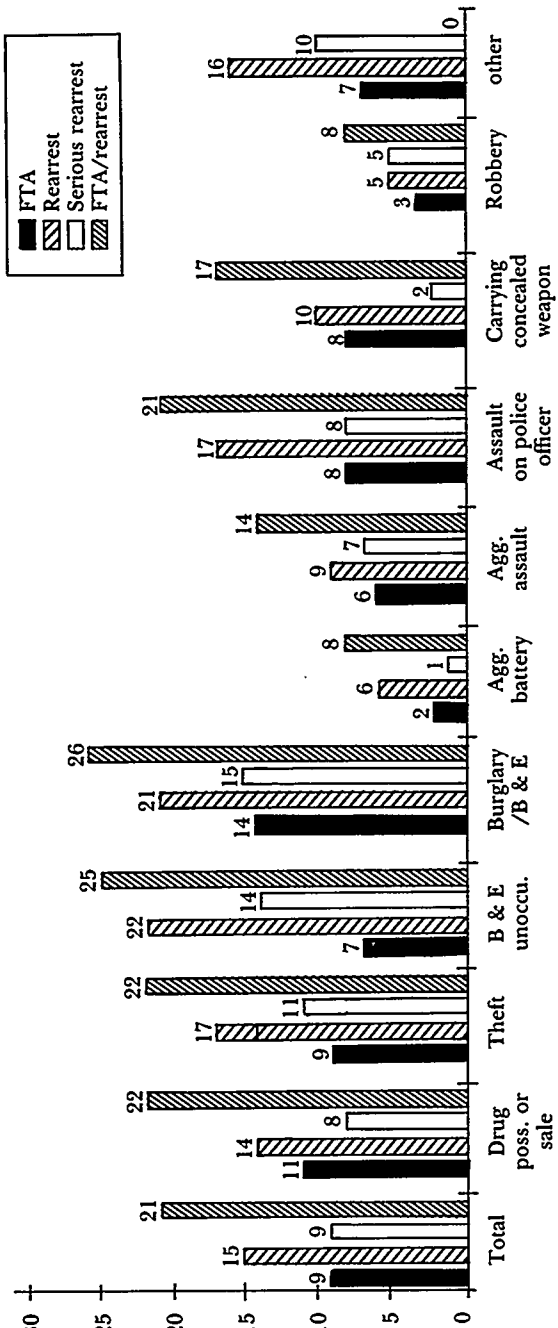
87 *See* A. Yezer, The Efficiency of Using Urine, *supra* note 6.

88 Smith argues that study of defendant misconduct during pretrial release based on a sample of releasees is likely to provide misleading results because of sample bias and that sample selection correction must be applied. *See id.*, *supra* note 6. We do not wholly agree, but leave that discussion to a subsequent section. *See infra* section VI.

89 To differentiate rearrest for any criminal offense from rearrest for offenses of the more serious kind generally at the core of public safety concerns, we arbitrarily measured serious rearrests to include the following offenses: assaults, kidnapping, rape, robbery, murder, manslaughter, and arson with personal harm.

FIGURE 2

MISCONDUCT (FLIGHT/CRIME) AMONG FELONY DEFENDANTS RELEASED IN DADE COUNTY, JUNE-JULY, 1987, BY SELECTED OFFENSE (IN ORDER OF FREQUENCY)



The rates of misconduct among Dade felony defendants in the sample were relatively low, only nine percent failed to appear; fifteen percent were rearrested (nine percent for serious crimes against the person).

A. DEMOGRAPHIC ATTRIBUTES

No notable relation between defendant demographics and pretrial release outcomes was found in this sample of Dade County felony defendants.

B. CHARGE-RELATED ATTRIBUTES

We found little variation in defendant outcomes during release when the felony rankings of defendants' most serious charges were taken into account. Variation in FTA rates can be seen when specific kinds of offenses are contrasted. Figure 2 shows FTA rates as low as two percent among defendants charged with aggravated battery, three percent among defendants charged with robbery, and as high as fifteen percent of defendants charged with theft and fourteen percent of defendants charged with burglary. Considerable variation based on kinds of offenses also was found when rearrest was examined. Once again, the lowest rates were found among defendants charged with aggravated battery and robbery (six and five percent respectively were rearrested) and the highest rates were found among defendants charged with burglary.

Defendants charged with weapons offenses had lower probabilities of being rearrested during pretrial release than defendants without weapons charges. No relation between weapons charges and serious rearrests or FTAs was found. When defendants charged with crimes against the person are compared with defendants charged with non-person crimes, no notable differences in pretrial release outcomes were found. When offenses are classified further to indicate whether injury to victims occurred, we found generally that persons charged with person crimes showed lower rates of misconduct, and persons charged with person crimes with injury showed the lowest rates. The presence of drug charges was not related to pretrial release outcomes. Further differentiating drug charges based on possession only versus other kinds of charges (*e.g.*, sale, distribution) did not reveal variation in defendant misconduct rates. When we grouped charges into two groups according to the force involved in the alleged offenses, one including no use of force or just verbal threats and one including actual use of force, slight differences were found in pretrial release outcomes: defendants

charged with crimes not involving force showed higher rates of FTA, rearrest, and serious rearrest than defendants charged with crimes involving force.

C. PRIOR CRIMINAL HISTORY ATTRIBUTES

Little variation in FTA rates was found based on the prior arrest history of defendants. Prior arrests did, however, appear moderately related to defendant rearrest during pretrial release: defendants with two or more prior arrests were rearrested proportionately three times as often as defendants with no history of prior arrests. Similar relations were found when serious rearrests were considered. Further, when history of arrests for serious person crimes, for serious property crimes, and for drug crimes were considered, the patterns of relations were similar (no relationships with failure to appear; noticeable relationships with rearrest). When history of weapons arrests was examined, we found no statistically significant relation with FTA, rearrest, or serious rearrest, and a significant but very slight relation with defendant failure-to-appear during pretrial release.

When prior convictions generally, prior convictions specifically for misdemeanors, felony offenses, and weapons convictions, prior felony and misdemeanor FTAs, and prior drug convictions were considered, the findings paralleled those reported above regarding arrest history. All but the prior misdemeanor FTA (bench warrant) measure had little apparent relation to the prospects of failing to appear in court, but did have a noticeable relation with rearrest and serious rearrest. Prior misdemeanor FTAs also were related to subsequent defendant failures-to-appear during pretrial release. When prior convictions for serious crimes against the person and for serious property crimes are considered, the relationship was modified somewhat: at the dichotomous level, individuals with these kinds of convictions showed higher rates of rearrest, and serious rearrest, but not of FTA. But, when we divided individuals with these histories into two classifications, namely those with one such prior conviction versus those with two or more, those with two or more showed only average rates of misconduct. The measure of whether defendants had outstanding warrants at the time of their arrests was related to all forms of defendant pretrial release outcomes. Yet, being on probation, or parole, or already on pretrial release from any earlier, open case at the time of arrest was not related to defendant misconduct.

D. SELF-REPORTED HEALTH, JAIL, AND DRUG ABUSE ATTRIBUTES

Through defendant interviews with pretrial services staff before the bond hearing, we learned when defendants reported histories of health-related problems, previously served jail time, and prior and current drug or alcohol use. We found no relationship between reports of physical or mental health problems or reports of previous confinement and subsequent defendant misconduct. Current self-reported drug use—for any controlled substance—was not significantly related to rearrest or serious rearrest during pretrial release, and was related only very slightly to failure to appear. Current alcohol abuse showed a noticeable relation to all pretrial release outcome measures.

E. DRUG TEST RESULTS AND DEFENDANT MISCONDUCT

Figure 3 displays the relationship between drug test results—including defendant non-participation (whether defendants refused to test, were unable to at the time, or were otherwise missed)—and outcomes during pretrial release.[90] Failure to appear rates varied from four percent to eleven percent of defendants depending on their urinalysis results. Defendants testing positively for marijuana only and defendants not having specimens tested showed the lowest rates of FTA of all defendants (in fact, these defendants failed to appear in court half as often as the other defendants). Defendants testing negatively for either marijuana or cocaine failed to appear in court at the average or middle rate (seven percent). Defendants testing positively for cocaine only or for both cocaine and marijuana showed the highest rates for failure to appear. Rates of rearrest also varied among defendants depending on test results. In this instance, the lowest rate was found among defendants testing negatively (eight percent rearrested) followed by defendants not tested (twelve percent). The highest rates, seventeen to eighteen percent, were found among defendants testing positively for either or both drugs. Negative test results and not being tested produced the lowest rates of rearrest for serious crimes during pretrial release among Dade defendants. Highest serious rearrest rates were found among defendants testing positively for cocaine only (ten percent) or for cocaine and marijuana at the same time (thirteen percent).

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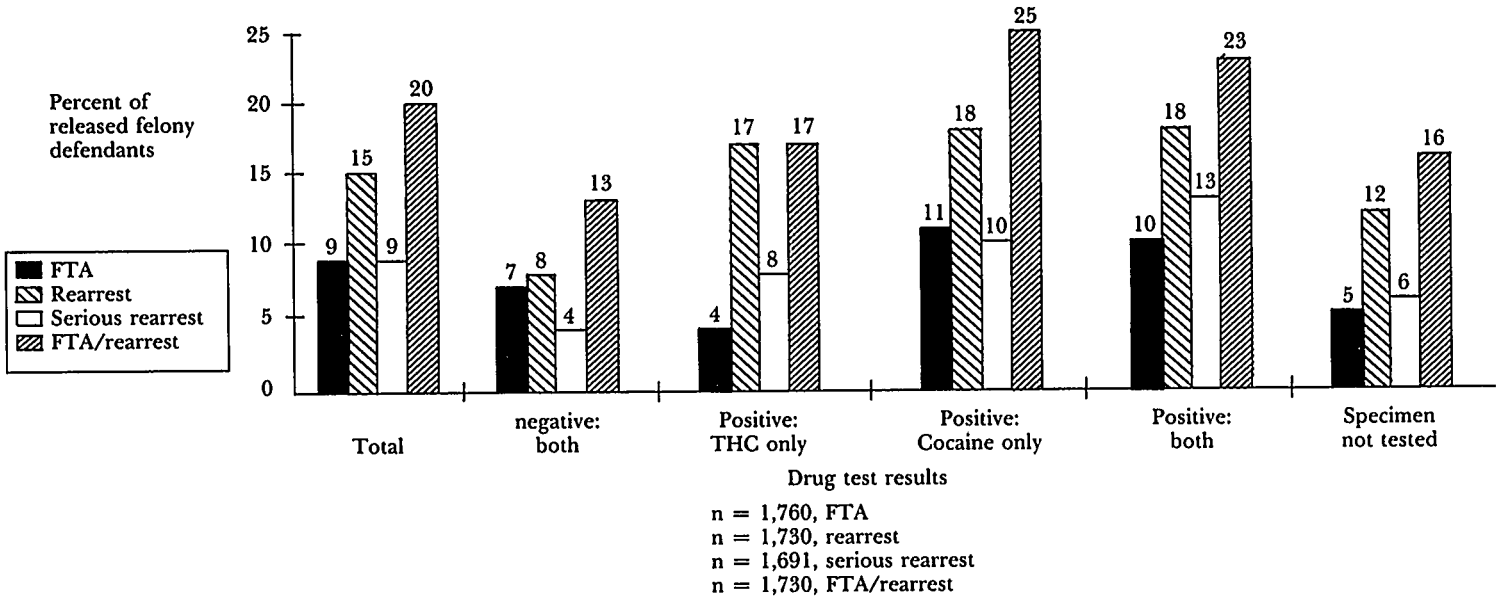
90 Although we tested entering defendants for the presence of metabolites of a range of common drugs of abuse, only marijuana and cocaine showed positive results in any sizeable number of cases. Thus, we were able mainly to ask whether positive tests for either marijuana or cocaine or both were related to defendant pretrial release outcomes. *See supra* note 76 and accompanying text.

FIGURE 3

MISCONDUCT (FLIGHT/CRIME) AMONG FELONY DEFENDANTS RELEASED IN DADE COUNTY, JUNE-JULY, 1987, BY DRUG TEST RESULTS



n = 1,760, FTA
n = 1,730, rearrest
n = 1,691, serious rearrest
n = 1,730, FTA/rearrest

V. The Relationship between Drug Test Results and Defendant Performance during Release after Exercising Controls: Multivariate Analysis

The logic of the multivariate analysis of defendant misconduct during pretrial release is quite straightforward: beyond the other defendant attributes that are related to failure-to-appear or rearrest, do drug test results add to the ability to predict? We employed logistic regression, first fitting the effects of all candidate predictor variables[91] to flight (no FTA v. one or more FTAs), and then to rearrest (no rearrest v. one or more rearrests) in separate analyses. The analysis then proceeded to eliminate successively unimportant independent variables from the model[92] until the most parsimonious, best-fitting model was produced. Once we reached that step, we added drug test variables to the pool of independent variables, and the model fitting process was repeated. Drug test results were measured in the following fashion: cocaine (negative, positive); marijuana (negative, positive); either marijuana or cocaine (negative, positive); and positive for both marijuana and cocaine (no, yes).[93]

A. FAILURE TO APPEAR

Table 6 shows the best fitting model of failure-to-appear (Model IB) that was produced without considering drug test results. Among the best predictors of FTA by defendants during the follow-up study were the absence of assault-related charges, being male, having self-reported use of any drug during the past year during the pre-bail interview, having outstanding warrants, and having agreed to a drug test. (Defendants who did test had a higher likelihood of FTA than those who did not.)

Table 7 (Model IIB) shows the logit model resulting when drug

91 The pool of potential predictor variables was defined first by eliminating those not having a statistically significant bivariate relation with the dependent variable based on the chi-squared value ($p=.05$ or better).

92 Variables were removed when comparison of the goodness of fit chi-squares between the models with and without each variable showed non-significant differences.

93 Our analysis proceeded first on the basis of a split half construction subsample randomly selected from the total sample. The idea was that we would want to validate predictive models derived from the construction sample on a validation sample to test their relative robustness. *Our initial analyses did not show drug test results to play an important role in pretrial misconduct.* Our best model of rearrest, for example, is summarized in Appendix Table A1. Upon application of this model to the validation sample, a number of variables became non-significant and would have dropped out. As a result, we turned to analysis on the total sample of felony defendants so that the potential influence of independent variables relating to drug testing would have every chance to be considered. Our construction/validation analyses, however, forewarned us of the possible instability of the coefficients reported in the models finally produced.

TABLE 6

LOGIT MODELS OF FTA, DADE COUNTY FELONY DEFENDANTS, JUNE-JULY, 1987: WITHOUT DRUG TEST RESULTS

	Model IA		Model IB	
Independent Variables	Coeff.	t-value	Coeff.	t-value
Burglary charges	0.038	(0.321)	—	—
Injury charges	−0.036	(−0.207)	—	—
Assault charges	−0.252	(−1.329)	−0.323	(−2.289)
Theft charges	0.032	(0.284)	—	—
Drug charges,				
(1) Misdemeanor, felony 3	−0.292	(−1.242)	—	—
(2) Felony 2, 1	0.279	(1.736)	—	—
Sex	0.276	(2.573)	0.268	(2.537)
Race				
(1) Black	−0.157	(−0.824)	—	—
(2) Hispanic	0.071	(0.316)	—	—
(3) Other	0.231	(0.483)	—	—
Self-reported substance abuse, past year	0.232	(2.520)	0.234	(2.578)
Prior felony FTA's	−0.011	(−0.077)	—	—
Prior misdemeanor FTA's	0.138	(0.974)	—	—
Outstanding warrants, 0 or 1 vs. 2 or more	0.331	(2.405)	0.387	(3.780)
Not tested	−0.343	(−2.626)	−0.340	(−2.620)
y intercept	−2.078	(−6.084)	−2.245	(−11.220)
Log likelihood	−531.919		−534.695	
Goodness of fit Chi-square	369.240		374.792	
P value	.990		.993	
DF	435		445	
Pseudo R^2 ($R^2 = c/(N+c)$)	0.167		0.169	
N	(1841)		(1841)	

test results also were considered. The gender variable dropped out of significance, while self-reported drug use and having outstanding warrants at the time of arrest remained in the model. None of the measures of drug results entered the final model with significant effect. No first order interactions were found to play a significant role in fitting models to defendant FTA. In short, controlling for the effects of other kinds of information available at the bail stage in Dade County Circuit Court, knowledge of drug test results does not add to the ability to predict defendant FTA.

B. REARREST

A number of different dependent variables came into play in the predictive analysis of rearrest. Moreover, different independent variables seemed to be important. Table 8 (Model IB) shows the logit model of rearrest during pretrial release derived when other

TABLE 7
LOGIT MODELS OF FTA, DADE COUNTY FELONY DEFENDANTS, JUNE-JULY, 1987: WITH DRUG TEST RESULTS

	Model IIA		Model IIB	
Independent Variables	Coeff.	t-value	Coeff.	t-value
Burglary charges	0.040	(0.295)	—	—
Injury charges	−0.132	(−0.609)	—	—
Assault charges	−0.228	(−0.967)	−0.372	(−2.190)
Theft charges	−0.023	(−0.180)	—	—
Drug charges				
(1) Misdemeanor, felony 3	−0.281	(−1.060)	—	—
(2) Felony 2, 1	0.291	(1.602)	—	—
Sex	0.190	(1.520)	—	—
Race				
(1) Black	−0.212	(−1.027)	—	—
(2) Hispanic	−0.111	(−0.450)	—	—
(3) Other	0.497	(0.990)	—	—
Self-reported substance abuse, past year	0.225	(2.174)	0.243	(2.432)
Prior felony FTA's	0.044	(0.280)	—	—
Prior misdemeanor FTA's	0.169	(1.086)	—	—
Outstanding warrants, 0 or 1 vs. 2 or more	0.293	(1.919)	0.389	(3.464)
Positive for marijuana	−0.104	(−0.989)	—	—
Positive for cocaine	0.230	(0.843)	—	—
Positive for either	−0.169	(−0.556)	—	—
Positive for both[a]	0.058	(0.000)	—	—
y intercept	−1.834	(−4.659)	−2.164	(−11.370)
Log likelihood	−416.896		−422.617	
Goodness of fit Chi-square	377.251		388.692	
P value	1.000		1.000	
DF	477		491	
Pseudo R^2 (R^2 = c/(N+c))	0.215		0.221	
N	(1374)		(1374)	

[a] Term did not pass tolerance test.

kinds of defendant information were considered without drug test results. Among the final independent measures, being over thirty years of age, having prior arrests for drug possession, and not participating in drug testing all pointed to a lower likelihood of defendant rearrest. Being charged with burglary or theft, having arrests within the last three years, having prior convictions, having prior drug convictions, and having outstanding warrants at the time of arrest were associated with a greater likelihood of rearrest during pretrial release.

When drug test results were added to the independent measures under consideration, one measure—testing positively for either marijuana or cocaine—did enter the final model. (See Table 9,

TABLE 8

LOGIT MODELS OF REARREST, DADE COUNTY FELONY DEFENDANTS, JUNE-JULY, 1987: WITHOUT DRUG TEST RESULTS

	Model IA		Model IB	
Independent Variables	Coeff.	t-value	Coeff.	t-value
Burglary charges	0.182	(1.960)	0.170	(2.193)
Injury charges	−0.062	(−0.466)	—	—
Assault charges	−0.050	(−0.343)	—	—
Theft charges	0.184	(2.076)	0.181	(2.482)
Drug charges, 0 vs. 1	0.059	(0.580)	—	—
Age, 30 or less vs. over 30	−0.161	(−2.192)	−0.172	(−2.363)
Self-reported substance abuse past year	0.037	(0.461)	—	—
Prior arrests	−0.037	(−0.198)	—	—
Recent prior arrests	0.441	(2.771)	0.458	(4.475)
Prior serious personal	−0.100	(−0.134)	—	—
Prior serious property	0.155	(1.779)	—	—
Prior drug arrests	0.181	(0.715)	—	—
Prior drug arrests - possession	−0.347	(−1.369)	−0.179	(−1.962)
Prior convictions	0.197	(1.241)	0.178	(2.035)
Prior felony convictions	0.071	(0.586)	—	—
Prior misdemeanor conv.	−0.056	(−0.427)	—	—
Prior ser. property conv.	−0.138	(−1.170)	—	—
Prior drug convictions	0.249	(1.038)	0.219	(2.068)
Prior drug convictions - possession	−0.081	(−0.340)	—	—
Prior FTA - felony	−0.096	(−0.831)	—	—
Prior FTA - misdemeanor	0.052	(0.438)	—	—
Outstanding warrants, 0 vs. 1	0.331	(3.112)	0.317	(4.150)
Not tested	−0.215	(−2.271)	−0.217	(−2.336)
y intercept	−1.805	(−7.200)	−1.700	(−12.120)
Log likelihood	−716.129		−720.092	
Goodness of fit Chi-square	1005.482		1013.409	
P value	.903		.923	
DF	1065		.1079	
Pseudo R^2 ($R^2 = c/(N+c)$)	0.358		0.360	
N	(1803)		(1803)	

Model IIB.) The coefficient can be interpreted as indicating that controlling for the effects of the other independent variables, knowledge of drug test results (whether positive for marijuana or cocaine) does add noticeably to the ability to predict rearrest. The defendant's age, having burglary charges or theft charges, and having prior drug convictions all dropped out of the rearrest equation with the entry of this drug test result. A defendant's prior arrest history for

TABLE 9

LOGIT MODELS OF REARREST, DADE COUNTY FELONY DEFENDANTS, JUNE-JULY, 1987: WITH DRUG TEST RESULTS

	Model IIA		Model IIB	
Independent Variables	Coeff.	t-value	Coeff.	t-value
Burglary charges	0.097	(0.892)	—	—
Injury charges	−0.048	(−0.305)	—	—
Assault charges	−0.062	(−0.353)	—	—
Theft charges	0.136	(1.325)	—	—
Drug charges, 0 vs. 1	0.008	(0.065)	—	—
Age, 30 or less vs. over 30	−0.093	(−1.085)	—	—
Self-reported substance abuse past year	0.017	(0.192)	—	—
Prior arrests	0.036	(−0.170)	—	—
Recent prior arrests	0.435	(2.462)	0.459	(4.159)
Prior serious personal arrests	−0.081	(−0.900)	—	—
Prior serious property arrests	0.163	(1.623)	0.186	(2.233)
Prior drug arrests	0.161	(0.582)	—	—
Prior drug arrests - possession	−0.386	(−1.404)	−0.228	(−2.205)
Prior convictions	0.117	(0.096)	—	—
Prior felony convictions	0.208	(1.474)	—	—
Prior misdemeanor conv.	−0.011	(−.075)	—	—
Prior ser. property conv.	−0.167	(−1.231)	—	—
Prior drug convictions	0.226	(0.879)	0.315	(2.797)
Prior drug convictions - possession	0.031	(0.123)	—	—
Prior FTA - felony	−0.118	(−0.895)	—	—
Prior FTA - misdemeanor	0.054	(0.394)	—	—
Outstanding warrants, 0 vs. 1	0.346	(2.856)	0.306	(3.534)
Positive for marijuana	0.000	(0.000)	—	—
Positive for cocaine	−0.172	(−1.055)	—	—
Positive for either	0.416	(2.025)	0.301	(2.449)
Positive for both[a]	0.028	(0.000)	—	—
y intercept	−1.841	(6.148)	−1.731	(−11.200)
Log likelihood	−549.173		−555.077	
Goodness of fit Chi-square	901.374		913.183	
P value	0.655		0.713	
DF	919		.938	
Pseudo R^2 ($R^2 = c/(N+c)$)	0.400		0.403	
N	(1350)		(1350)	

[a]Term did not pass tolerance test.

serious property crimes entered the rearrest model with the addition of testing positively for marijuana or cocaine.

When first-order interaction effects were considered, none was

found to be significant in the analysis of rearrest that did not include drug test results. However, the predictive role for drug test results was increased when interaction effects were considered in the model with drug test results (Table 10, Model IIIC). Age interacted with testing positively for either cocaine or marijuana. Thus, judging from the parameter estimates, drug test results may be interpreted as making two separate and comparable contributions to the modeling of defendant rearrest: defendants testing positively for either drug had a greater probability of rearrest, other factors held constant. Furthermore, defendants who tested positively but were over thirty years old had a notably lower probability of rearrest than other defendants during pretrial release.

TABLE 10

LOGIT MODELS OF REARREST WITH INTERACTIONS, DADE COUNTY FELONY DEFENDANTS, JUNE-JULY, 1987: WITH DRUG TEST RESULTS

	Model IIIA		Model IIIB		Model IIIC	
Independent Variables	Coeff.	t-value	Coeff.	t-value	Coeff.	t-value
Burglary charges	0.998	(0.910)	—	—	—	—
Injury charges	−0.039	(−0.243)	—	—	—	—
Assault charges	−0.069	(−0.389)	—	—	—	—
Theft charges	0.131	(1.267)	0.152	(1.730)	—	—
Drug charges	−0.005	(−0.040)	—	—	—	—
Age	0.102	(0.772)	0.113	(0.786)	0.095	(0.756)
Sex	0.088	(0.455)	0.088	(0.456)	—	—
Black/non-black	−0.165	(−1.183)	−0.179	(−1.293)	—	—
Substance abuse past year	−0.002	(−0.027)	0.017	(0.183)	—	—
Prior arrests	0.023	(0.110)	—	—	—	—
Recent prior arrests	0.368	(1.721)	0.381	(2.357)	0.460	(4.135)
Recent prior ser. personal arrests	−0.099	(−1.077)	—	—	—	—
Recent prior ser. property arrests	0.366	(2.328)	0.374	(2.431)	0.176	(2.097)
Recent drug arrests	0.185	(0.666)	0.147	(0.553)	—	—
Recent drug possession	−0.291	(−0.940)	−0.259	(−0.872)	−0.224	(−2.147)
Recent prior conviction	0.029	(0.160)	—	—	—	—
Prior conviction - felony	0.209	(1.451)	0.188	(1.523)	—	—
Prior conviction - misdemeanor	−0.016	(−0.107)	—	—	—	—
Prior conviction - property	−0.158	(−1.151)	−0.151	(−1.118)	—	—
Prior conviction - drugs	0.245	(0.942)	0.283	(2.219)	0.329	(2.899)
Prior conviction - drug possession	0.033	(0.128)	—	—	—	—
FTA - felony	−0.118	(−0.883)	−0.099	(−0.746)	—	—
FTA - misdemeanor	0.072	(0.517)	—	—	—	—
Outstanding warrants, 0 vs. 1	0.325	(2.650)	0.345	(3.096)	0.317	(3.613)
Positive for marijuana[a]	0.004	(0.050)	0.004	(0.000)	—	—
Positive for cocaine	−0.124	(−0.764)	−0.098	(−0.603)	—	—
Positive for either	0.182	(0.639)	0.175	(0.642)	0.271	(2.111)
Positive for both[a]	0.000	(0.000)	0.001	(0.010)	—	—
Not tested (no vs. yes)	—	—	—	—	—	—
Age X Positive for either	−0.286	(−2.165)	−0.278	(−2.101)	−0.292	(−2.316)
Recent prior arrests X Positive for either	0.080	(0.496)	0.073	(0.456)	—	—
Serious property X Positive for either	−0.271	(−1.814)	−0.268	(−1.806)	—	—
Prior possession X Positive for either	−0.137	(−0.861)	−0.126	(−0.796)	—	—
Black/non-black X Positive for either	−0.197	(1.427)	0.192	(1.403)	—	—
Sex X Positive for either	−0.119	(−0.616)	−0.122	(−0.636)	—	—
Self-reported substance abuse X Age	—	—	0.029	(0.303)	—	—
y intercept	−1.734	(−4.774)	−1.656	(−6.143)	−1.764	(−11.110)
Log likelihood	−540.569		−542.955		−549.338	
Goodness of fit Chi-square	959.719		705.919		718.685	
P value	0.973		0.273		0.304	
DF	1046		684		700	
Pseudo R^2 (R^2 = c/(N+c))	0.417		0.344		0.348	
N	(1341)		(1346)		(1346)	

[a]Term did not pass tolerance test.

TABLE 11

LOGIT MODELS OF REARREST FOR SERIOUS CRIMES AGAINST THE PERSON, DADE COUNTY FELONY DEFENDANTS, JUNE-JULY, 1987: WITHOUT DRUG TEST RESULTS

	Model IA		Model IB	
Independent Variables	Coeff.	t-value	Coeff.	t-value
Burglary charges	0.188	(1.632)	—	—
Injury charges	−0.208	(−1.088)	−0.274	(−1.968)
Assault charges	−0.137	(−0.615)	—	—
Theft charges	0.168	(1.518)	—	—
Force	0.138	(0.633)	—	—
Drug charges	0.042	(0.325)	—	—
Sex	−0.059	(−0.405)	—	—
Age, 26-30 vs. Other	0.148	(1.582)	—	—
Prior arrests	0.213	(0.928)		
Recent prior arrests	0.305	(1.653)	0.498	(3.810)
Prior serious personal	0.031	(0.291)	—	—
Prior serious property	0.232	(2.136)	0.291	(3.152)
Prior drug arrests	0.117	(0.399)	—	—
Prior drug arrests - possession	−0.367	(−1.278)	−0.246	(−2.121)
Prior drug arrests - sale/manuf./delivery	0.098	(0.582)	—	—
Prior weapons arrests	−0.180	(−1.395)	—	—
Prior conviction 0 or 1 vs. 2 or more	0.076	(0.431)	—	—
Prior felony convictions	0.061	(0.382)	—	—
Prior misdemeanor convictions 0 or 1 vs. 2 or more	0.053	(0.370)	—	—
Prior ser. personal conv.	0.089	(0.589)	—	—
Prior ser. property conv.	−0.127	(−0.883)	—	—
Prior drug convictions	0.579	(1.952)	0.343	(2.746)
Prior drug convictions - possession	−0.386	(−1.392)	—	—
Prior drug convictions - sale/manuf./delivery	0.062	(0.267)	—	—
Prior weapons convictions	0.142	(0.837)	—	—
Prior FTA - felony	0.024	(0.180)	—	—
Prior FTA - misdemeanor	0.152	(1.120)	—	—
Outstanding warrants, 0 or 1 vs. 2 or more	0.323	(2.477)	0.430	(4.406)
Not tested	−0.287	(−2.299)	−0.280	(−2.296)
y intercept	−2.114	(−5.135)	−2.462	(−12.150)
Log likelihood	−495.555		−505.534	
Goodness of fit Chi-square	812.194		832.152	
P value	1.000		1.000	
DF	1122		1144	
Pseudo R^2 ($R^2 = c/(N+c)$)	0.316		0.321	
N	(1761)		(1761)	

TABLE 12

LOGIT MODELS OF REARREST FOR SERIOUS CRIMES AGAINST THE PERSON, DADE COUNTY FELONY DEFENDANTS, JUNE-JULY, 1987: WITH DRUG TEST RESULTS

	Model IIA		Model IIB	
Independent Variables	Coeff.	t-value	Coeff.	t-value
Burglary charges	0.123	(0.913)	—	—
Injury charges	−0.085	(−0.394)	—	—
Assault charges	−0.283	(−1.040)	—	—
Theft charges	0.073	(0.572)	—	—
Force	0.226	(0.900)	—	—
Drug charges	−0.053	(−0.356)	—	—
Sex	−0.011	(−0.071)	—	—
Age, 26-30 vs. Other	0.099	(0.905)	—	—
Prior arrests	0.184	(0.714)	—	—
Recent prior arrests	0.348	(1.659)	0.483	(3.344)
Prior serious personal arrests	−0.063	(−0.511)	—	—
Prior serious property arrests	0.199	(1.609)	0.210	(2.047)
Prior drug arrests	−0.027	(−0.085)	—	—
Prior drug arrests—possession	−0.334	(−1.079)	−0.325	(−2.478)
Prior drug arrests—sale/manufacture/delivery	0.211	(1.120)	—	—
Prior weapons arrests	−0.105	(−0.708)	—	—
Prior convictions, 0 or 1 vs. 2 or more	−0.013	(−0.064)	—	—
Prior felony convictions	0.154	(0.841)	—	—
Prior misdemeanor convictions 0 or 1 vs. 2 or more	0.136	(0.803)	—	—
Prior ser. personal convictions	0.008	(0.042)	—	—
Prior ser. property convictions	−0.209	(−1.259)	—	—
Prior drug convictions	0.626	(1.928)	0.435	(3.124)
Prior drug convictions—possession	−0.341	(−1.130)	—	—
Prior drug convictions—sale/manufacture/delivery	−0.134	(−0.518)	—	—
Prior weapons convictions	0.063	(0.320)	—	—
Prior FTA - felony	−0.034	(−0.218)	—	—
Prior FTA - misdemeanor	0.120	(0.768)	—	—
Outstanding warrants, 0 or 1 vs. 2 or more	0.424	(2.860)	0.469	(4.308)
Positive for marijuana	0.096	(0.903)	—	—
Positive for cocaine	−0.053	(0.242)	—	—
Positive for either	0.371	(1,313)	0.428	(2.457)
Positive for both[a]	0.079	(0.000)	—	—
y intercept	−2.293	(−4.831)	−2.254	(−10.610)
Log likelihood	−383.794		−391.139	
Goodness of fit Chi-square	665.718		680.408	
P value	1.000		1.000	
DF	920		945	
Pseudo R^2 (R^2 = c/(N+c))	0.336		0.341	
N	(1317)		(1317)	

[a] Term did not pass tolerance test.

C. REARREST FOR SERIOUS PERSON CRIMES

Tables 11 and 12 summarize the logit models developed when rearrest for serious crimes against the person was the outcome of predictive concern. Table 11, Model IB (without drug test results) shows a final model in which defendants having criminal charges involving injury, having a prior arrest history for drug possession offenses, or having not participated in the testing showed lower likelihoods of later rearrests for serious crimes against the person. Having a general arrest history and/or having prior arrests for serious property or serious personal crimes, having a prior history of drug convictions (of any kind), and having outstanding warrants were related to a greater likelihood of rearrest for serious person crimes. When drug test information was considered in the logit analysis in Table 12 (Model IIB), three of the independent variables dropped out (injury-related charges, prior arrests, and prior serious person arrests). The variable recent arrests (within the last three years) was added and testing positively for either marijuana or cocaine entered showing a moderate relation with serious person rearrest when other factors were controlled. First-order interaction effects did not play a role in the modeling of serious person crime rearrests when examined.

VI. PREDICTION OF DEFENDANT FLIGHT AND REARREST, AND SELECTION BIAS

In their recent paper, Smith *et al.*[94] argued that predictive analyses of defendant misconduct during pretrial release typically suffer from sample selection bias, "a potentially serious problem."[95] Specifically, they contend that predictive analyses based on released defendants employ a potentially biased sample, one that is not representative of all defendants entering the system at the bail stage. To the extent that pretrial detention screens defendants from being "at risk" according to criteria related to FTA or rearrest during pretrial release, the task of differentiating likely failures from successes among released defendants—most of whom should be lower risk due to the screening effect of detention—can produce misleading results. Smith *et al.* argue that risk models of flight or rearrest that have not been conditioned on the modeling of the exclusion of defendants from the sample (through detention) may be inaccurate.

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94 Smith, *supra* note 6, at 103-04.

95 This argument was made earlier by William Rhodes and Shelley Matsuba in a study of Federal bail violations. *See* Rhodes & Matsuba, *Pretrial Release in Federal Courts: A Structural Model with Selectivity and Qualitative Dependant Variables*, 8 EVAL. REV. 692 (1985).

They further assert that this is particularly important when trying to identify the effect of one particular kind of independent variable, drug testing, in such prediction, especially if that variable has had an important impact on the exclusion process. Thus, analyses that do not correct for the sample selection bias of pretrial detention wrongly may conclude that an effect is significant (as we do in the analysis of rearrest) or entirely absent (as we do in the analysis of failure-to-appear). In our view, the theoretical question which precedes the sample selection bias question involves the proper conceptualization of the populations about which inferences are to be made. In this case, there is reason to believe that the boundaries of the released population are sufficiently stable to construe it as a population of interest. It is true that samples of released and detained defendants quite likely differ—and indeed may differ along lines related to risk of flight or crime (hopefully jailing of defendants before trial is not done on a random basis[96]). It is not clear, however, that the result of modeling of defendant misconduct based on samples of released defendants will be misleading.

At the same time, other sources of sample selection might be even *more* problematic. For example, most studies of drug testing at the pretrial release stage rely on voluntary participation in urine testing. As a result, some defendants in the sample (whether the total sample or the sample of all released defendants are viewed as the appropriate population) do not provide urine for testing. This excludes from the analysis of the predictive contribution of drug test results a potentially important group, possibly made up of defendants who would test on the whole positively. If it is to be argued that drug testing results are related strongly to subsequent pretrial crime or flight, then the exclusion of these defendants might greatly bias the analyses. In practice, this exclusion is often of the same magnitude as the exclusion due to detention. In our Dade County sample of felony defendants, twenty-eight percent were detained as a result of bond hearing proceedings, and thus were excluded from our analysis of defendant performance during release. Approximately twenty-three percent did not participate voluntarily in testing, and thus were excluded from analyses when drug test results were the focus.[97] Regarding the Smith sample, one could thus argue that the selection exercised by defendants interviewing but not

96 For a discussion of this issue, see Goldkamp, *Bail, Discrimination and Control*, 16 J. CRIM. JUST. ABSTRACTS 1 (Mar. 1984).

97 A glance at the derivation of the Smith et al./Belenko-Mara-Drita sample shows that non-testing had a limiting impact on that sample of defendants as well, although we cannot be as certain of the magnitudes. *See supra* Table 1.

agreeing to test could have had an important influence in biasing the sample. Before that, the gap between contacting defendants and being refused even the interview, and the gap between a representative sample of Manhattan defendants and those contacted on an availability basis also would have to be seen as screening stages adding to the possible bias of the final sample, if they occurred on a nonrandom basis.

Therefore, we test empirically the Smith *et al.* argument that risk analysis of misconduct may suffer "serious" selection bias because of pretrial detention. (In reality, one may argue from sampling theory that released defendants *do* constitute the appropriate sampling frame). We also are concerned that sample selection correction deserves study when sizeable numbers of released defendants have not provided urine specimens. (Admittedly, we are curious that defendants not participating in testing in the Dade County sample had a lower probability of flight and rearrest than defendants who tested, even after the effects of other factors had been controlled.) Although we can argue that the best sample for studying flight or crime during pretrial release is a sample of released defendants, it may not be true that the best sample for the study of the relationship between drug test results and misconduct during pretrial release is a sample of released defendants who agreed to provide urine.

Following the two stage modeling approach illustrated by Berk[98] among others, we first constructed "hazard rates" representing the odds of being excluded from the sample due to detention (see Table 13) or to not testing (see Table 14).[99] Tables 15 through 20 summarize the modeling of FTA and rearrest conditioned on these hazard rates using logistic regression.[100]

A. FAILURE TO APPEAR

When drug test results are not considered in the model, the

98 Berk, *An Introduction to Sample Selection Bias in Sociological Data*, 48 AM. SOC. REV. 386, 393-96 (1983).

99 In conducting this analysis, we have adopted, for practical reasons, the two stage approach using logit analysis, although it may result in less efficient estimates than a one stage maximum likelihood approach. Because our other analyses have been conducted using the logit approach, we chose to continue within a logit framework. We believe that the differences in substantive findings when compared to other correction approaches would be unlikely or slight indeed.

100 The hazard rates are transformations into probabilities of the predicted values of detention and not testing. Hazard rate = exp(predicted probability)/1 + exp(predicted probability). Due to limitations of space, we do not present the results of the selectivity bias analysis of serious rearrest.

TABLE 13

LOGIT MODELS OF RELEASE VS. DETENTION WITHIN 90 DAYS OR PRIOR TO CASE DISPOSITION DADE COUNTY FELONY DEFENDANTS, JUNE-JULY, 1987

	Model 1		Model 2	
Independent Variables	Coeff.	t-value	Coeff.	t-value
Theft	−0.169	(−2.539)	−0.170	(−2.842)
Robbery	0.266	(1.886)	0.299	(2.360)
Burglary	0.189	(2.769)	0.199	(3.421)
Injury	0.072	(0.540)	—	—
Assault	−0.044	(−0.461)	—	—
Drug charges				
(1) Misdemeanor	0.201	(0.000)	—	—
(2) Felony 3	−0.016	(−0.035)	—	—
(3) Felony 2 or 1	0.310	(0.775)	—	—
Drug charges, any	−0.339	(−0.570)	—	—
Person victims				
(1) One	0.156	(1.096)	0.161	(1.525)
(2) Two or more	0.280	(1.734)	0.272	(1.826)
Gender	−0.076	(−0.969)	—	—
Race				
(1) Black	0.167	(1.112)	0.168	(1.119)
(2) Hispanic	0.305	(1.836)	0.328	(1.993)
(3) Other	−0.416	(−1.003)	−0.433	(−1.048)
Marital status	−0.049	(−0.618)	—	—
Telephone	−0.018	(−0.283)	—	—
Local address	0.036	(0.578)	—	—
Prior arrests, 0 vs. 1 or more	0.030	(0.322)	—	—
Prior ser. person arrests, 0 vs. 1 or more	0.014	(0.246)	—	—
Prior ser. property arrests 0 vs. 1 or more	0.163	(2.652)	0.189	(3.240)
Prior arrests, drug sales, manufacture, distsribution	0.073	(0.887)	—	—
Prior weapons arrests, 0 vs. 1 or more	−0.046	(−0.747)	—	—
Prior felony convictions, 0 vs. 1 or more	0.213	(2.883)	0.184	(2.749)
Prior misdemeanor convictions 0 vs. 1 or more	0.103	(1.688)	—	—
Prior drug convictions, 0 vs. 1 or more	−0.130	(−1.712)	—	—
Prior felony FTAs, 0 vs. 1 or more	0.035	(0.371)	—	—
Prior misdemeanor FTAs, 0 vs. 1 or more	−0.101	(−1.093)	—	—
Outstanding warrants 0 vs. 1 or more	0.120	(1.503)	—	—
Risk group				
2	−0.033	(−0.314)	−0.086	(−0.892)
3	0.119	(1.196)	0.196	(2.424)
4	0.200	(1.100)	0.323	(2.695)
y intercept	−0.625	(−1.645)	−0.606	(−2.948)
Log likelihood	−1335.994		−1344.952	
Goodness of fit Chi-square	2248.154		273.992	
P value	.000		.323	
DF	1954		264	
Pseudo R^2 ($R^2 = c/(N+c)$)	0.474		0.099	
N	2493		2499	

TABLE 14

LOGIT MODELS OF NON-PARTICIPATION IN DRUG TESTING, DADE COUNTY FELONY DEFENDANTS, JUNE-JULY, 1987

	Model 1		Model 2	
Independent Variables	Coeff.	t-value	Coeff.	t-value
Injury	0.192	(3.094)	0.190	(3.112)
Drug charges				
(1) Misdemeanor	0.065	(0.109)	—	—
(2) Felony 3	−0.045	(−0.107)	—	—
(3) Felony 2 or 1	0.036	(0.0)	—	—
Drug charges, any	<0.000	(<0.000)	—	—
Drug type				
(1) Marijuana	−0.330	(−0.760)	−0.328	(−1.375)
(2) Cocaine	0.035	(0.0)	0.072	(0.446)
(3) Other	−0.034	(−0.065)	−0.036	(0.096)
Employment	−0.224	(−4.102)	−0.238	(−4.415)
Substance abuse, past year	−0.727	(−1.197)	—	—
Substance abuse, now	0.598	(0.985)	—	—
Marijuana, past year	0.187	(0.284)	—	—
Marijuana, now	−0.494	(−0.743)	−0.413	(−3.461)
Cocaine, past year	0.529	(0.755)	—	—
Cocaine, now	−0.555	(−0.788)	—	—
Prior arrests,				
0 vs. 1 or more	0.028	(0.247)	—	—
Recent prior arrests,				
0 vs. 1 or more	−0.007	(−0.075)	—	—
Prior ser. person arrests,				
0 vs. 1 or more	0.093	(1.441)	0.142	(2.699)
Prior ser. property arrests				
0 vs. 1 or more	0.040	(0.586)	—	—
Prior weapons arrests,				
0 vs. 1 or more	0.029	(0.443)	—	—
Prior convictions,				
0 vs. 1 or more	0.025	(0.203)	—	—
Prior felony convictions,				
0 vs. 1 or more	0.048	(0.518)	—	—
Prior misdemeanor convictions				
0 vs. 1 or more	0.023	(0.225)	—	—
Prior convictions ser. person				
0 vs. 1 or more	−0.017	(−0.187)	—	—
Prior conviction, ser. property				
0 vs. 1 or more	0.077	(0.858)	0.153	(2.479)
Prior misdemeanor FTAs,				
0 vs. 1 or more	0.163	(1.758)	—	—
Outstanding warrants				
0 or 1 vs. 2 or more	−0.080	(−1.016)	—	—
y intercept	−1.665	(−4.049)	−1.702	(−9.049)
Log likelihood	−1266.943		−1272.838	
Goodness of fit Chi-square	999.483		1011.272	
P value	0.570		0.614	
DF	1008		1025	
Pseudo R^2 ($R^2 = c/(N+c)$)	0.284		0.286	
N	2520		2520	

TABLE 15

LOGIT MODELS OF FTA, DADE COUNTY FELONY DEFENDANTS, JUNE-JULY, 1987: WITHOUT DRUG TESTS RESULTS; WITH HAZARD RATE (DETENTION)

	Model IIIA		Model IIIB	
Independent Variables	Coeff.	t-value	Coeff.	t-value
Burglary charges	0.108	(0.851)	—	—
Injury charges	0.027	(0.150)	—	—
Assault charges	−0.265	(−1.376)	−0.323	(−2.289)
Theft charges	−0.008	(−0.071)	—	—
Drug charges				
(1) Misdemeanor, felony 3	−0.290	(−1.235)	—	—
(2) Felony 2, 1	0.281	(1.744)	—	—
Sex	0.244	(2.249)	0.270	(2.537)
Race				
(1) Black	−0.029	(−0.140)	—	—
(2) Hispanic	0.262	(1.049)	—	—
(3) Other	−0.083	(−0.163)	—	—
Self-reported substance abuse, past year	0.246	(2.686)	0.234	(2.578)
Prior felony FTA's	0.044	(0.301)	—	—
Prior misdemeanor FTA's	0.154	(1.079)	—	—
Outstanding warrants, 0 or 1 vs. 2 or more	0.351	(2.529)	0.387	(3.780)
Not tested	−0.331	(−2.580)	−0.340	(−2.620)
Hazard rate (detention)	−2.409	(−1.721)	—	—
y intercept	−0.986	(−1.372)	−2.245	(−11.220)
Log likelihood	−530.402		−534.695	
Goodness of fit Chi-square	666.409		674.995	
P value	1.000		1.000	
DF	998		1009	
Pseudo R^2 ($R^2 = c/(N+c)$)	0.266		0.268	
N	(1841)		(1841)	

detention hazard rate does not enter significantly into a final model of failure-to-appear (Table 15, Model IIIB). When entered in the model considering the impact of drug test results as well as the other defendant descriptors (Table 16, Model IVB), it is again not significant, and has no effect on the earlier model of failure-to-appear. Even with the detention hazard rate added to the model, significant effects are not found for any of the drug test variables in the modeling of FTA. Table 17, Model VB considers the impact of a hazard rate for not testing in the modeling of FTA. No impact is seen.

B. REARREST

Model IVB in Table 18 considers the former model of rearrest fitted in Model IB without considering drug test results. The detention hazard rate does not enter, but there are some slight changes in

TABLE 16

LOGIT MODELS OF FTA, DADE COUNTY FELONY DEFENDANTS, JUNE-JULY, 1987: WITH DRUG TEST RESULTS; WITH HAZARD RATE (DETENTION)

	Model IVA		Model IVB	
Independent Variables	Coeff.	t-value	Coeff.	t-value
Burglary charges	0.116	(0.810)	—	—
Injury charges	−0.057	(−0.256)	—	—
Assault charges	−0.245	(−1.023)	−0.372	(−2.190)
Theft charges	−0.071	(−0.537)	—	—
Drug charges				
(1) Misdemeanor, felony 3	−0.284	(−1.071)	—	—
(2) Felony 2, 1	0.282	(1.549)	—	—
Sex	0.160	(1.268)	—	—
Race				
(1) Black	−0.072	(−0.326)	—	—
(2) Hispanic	0.114	(0.407)	—	—
(3) Other	0.142	(0.262)	—	—
Self-reported substance abuse, past year	0.237	(2.281)	0.243	(2.432)
Prior felony FTA's	0.102	(0.631)	—	—
Prior misdemeanor FTA's	0.188	(1.196)	—	—
Outstanding warrants, 0 or 1 vs. 2 or more	0.315	(2.035)	0.389	(3.464)
Positive for marijuana[a]	−0.067	(0.000)	—	—
Positive for cocaine	0.299	(1.099)	—	—
Positive for either	−0.200	(−0.699)	—	—
Positive for both	−0.021	(−0.200)	—	—
Hazard rate (detention)	−2.811	(−1.752)	—	—
y intercept	−0.603	(−0.749)	−2.164	(−11.370)
Log likelihood	−415.321		−422.617	
Goodness of fit Chi-square	618.792		633.384	
P value	1.000		1.000	
DF	929		944	
Pseudo R^2 ($R^2 = c/(N+c)$)	0.311		0.316	
N	(1374)		(1374)	

[a] Term did not pass tolerance test.

the model of rearrest: prior drug arrests for possession and prior drug convictions drop out as predictors. Model VB in Table 19 includes the detention hazard rate in the refitting of model IIB, which introduced drug test results as possible predictors of rearrest. The hazard rate is not significant in the analysis, and does not have an impact. Model VIB in Table 20 shows the not-testing hazard rate to have only a slight impact on the Model II solution: theft charges replace the serious property arrests of the earlier model.

The general finding of no impact on the fitting of models of defendant misconduct when sample selection bias is considered in this fashion indicates that, at least in this case (though conceivably in others as well), risk analyses of defendant misconduct that do not

TABLE 17

LOGIT MODELS OF FTA, DADE COUNTY FELONY DEFENDANTS, JUNE-JULY, 1987: WITH DRUG TEST RESULTS; WITH HAZARD RATE (NOT TESTING)

	Model VA		Model VB	
Independent Variables	Coeff.	t-value	Coeff.	t-value
Burglary charges	0.044	(0.323)	—	—
Injury charges	−0.101	(−0.451)	—	—
Assault charges	−0.226	(−0.957)	−0.372	(−2.190)
Theft charges	−0.019	(−0.150)	—	—
Drug charges				
(1) Misdemeanor, felony 3	−0.325	(−1.188)	—	—
(2) Felony 2, 1	0.322	(1.715)		
Sex	0.193	(1.546)	—	—
Race				
(1) Black	−0.198	(−0.957)	—	—
(2) Hispanic	−0.108	(−0.437)	—	—
(3) Other	0.476	(0.946)	—	—
Self-reported substance abuse, past year	0.175	(1.382)	0.243	(2.432)
Prior felony FTA's	0.045	(0.289)	—	—
Prior misdemeanor FTA's	0.169	(1.089)	—	—
Outstanding warrants, 0 or 1 vs. 2 or more	0.299	(1.954)	0.389	(3,464)
Positive for marijuana[a]	−0.062	(−0.589)	—	—
Positive for cocaine	0.288	(1.055)	—	—
Positive for either	−0.214	(−0.704)	—	—
Positive for both[a]	0.009	(−0.000)	—	—
Hazard rate (not testing)	−2.936	(−0.666)	—	—
y intercept	−1.407	(−1.877)	−2.164	(−11.370)
Log likelihood	−416.673		−422.617	
Goodness of fit Chi-square	593.186		605.072	
P value	1.000		1.000	
DF	857		872	
Pseudo R^2 (R^2 = c/(N+c))	0.302		0.306	
N	(1374)		(1374)	

[a] Term did not pass the tolerance test.

"correct" for selection bias may not routinely (or "seriously") mislead.

VII. THE UTILITY OF DRUG TESTING FOR PURPOSES OF BAIL AND PRETRIAL RELEASE: CONCLUSION

The objective of this study was to provide findings bearing on the potential usefulness of drug testing as an aid to judicial decision-making at the bail stage.[101] Our evaluation has been purposely em-

[101] We do not address the question of the utility of drug testing to monitor the compliance of defendants with conditions of pretrial release, which is a second proposed use of drug testing at this stage in the criminal process. The authors and others currently are examining several experiments in BJA demonstration sites.

TABLE 18

LOGIT MODELS OF REARREST, DADE COUNTY FELONY DEFENDANTS, JUNE-JULY, 1987: WITHOUT DRUG TEST RESULTS; WITH HAZARD RATE (DETENTION)

	Model IVA		Model IVB	
Independent Variables	Coeff.	t-value	Coeff.	t-value
Burglary charges	0.183	(1.847)	0.177	(2.290)
Injury charges	−0.081	(0.558)	—	—
Assault charges	−0.061	(−0.414)	—	—
Theft charges	0.188	(1.915)	0.170	(2.340)
Drug charges 0 vs. 1	0.062	(0.607)	—	—
Age, 30 or less vs. over 30	−0.165	(−2.237)	−0.173	(−2.380)
Self-reported substance abuse, past year	0.043	(0.532)	—	—
Prior arrests	−0.036	(−0.191)	—	—
Recent prior arrests	0.428	(2.656)	0.398	(4.026)
Prior serious personal	−0.009	(−0.116)	—	—
Prior serious property	0.132	(1.333)	—	—
Prior drug arrests	0.189	(0.746)	—	—
Prior drug arrests - possession	−0.348	(−1.372)	—	—
Prior convictions	0.213	(1.336)	0.224	(2.756)
Prior felony convictions	0.040	(0.290)	—	—
Prior misdemeanor conv.	−0.065	(−0.494)	—	—
Prior ser. property conv.	−0.114	(−0.958)	—	—
Prior drug convictions	0.253	(1.054)	—	—
Prior drug convictions - possession	−0.082	(−0.346)	—	—
Prior FTA - felony	−0.111	(−0.949)	—	—
Prior FTA - misdemeanor	0.064	(0.530)	—	—
Outstanding warrants, 0 vs. 1	0.327	(3.066)	0.313	(4.092)
Not tested	−0.209	(−2.202)	−0.210	(−2.261)
Hazard rate (detention)	0.318	(0.185)	—	—
y intercept	−1.966	(−2.212)	−1.774	(−13.930)
Log likelihood	−713.566		−720.111	
Goodness of fit Chi-square	1232.653		1245.743	
P value	1.000		1.000	
DF	1480		1425	
Pseudo R^2 (R^2 = c/(N+c))	0.406		0.409	
N	(1803)		(1803)	

pirical. The reason is simple: without empirical evidence supporting the fundamental assertion of proponents of bail stage drug testing, namely that a strong relationship exists between drug use and defendant behavior during pretrial release, discussion of constitutional or ethical questions becomes much less compelling. Although we do not suggest that decisions about the appropriateness and desirability of such programs should stop with empirical analysis, they should perhaps start there.

We sought to determine whether the empirical findings in

TABLE 19

LOGIT MODELS OF REARREST, DADE COUNTY FELONY DEFENDANTS, JUNE-JULY, 1987: WITH DRUG TEST RESULTS; WITH HAZARD RATE (DETENTION)

	Model VA		Model VB	
Independent Variables	Coeff.	t-value	Coeff.	t-value
Burglary charges	0.133	(1.161)	—	—
Injury charges	−0.011	(−0.064)	—	—
Assault charges	−0.085	(−0.470)	—	—
Theft charges	0.094	(0.825)	—	—
Drug charges 0 vs. 1	−0.008	(0.071)	—	—
Age, 30 or less vs. over 30	−0.097	(−1.128)	—	—
Self-reported substance abuse, past year	0.020	(0.226)	—	—
Prior arrests	0.027	(0.127)	—	—
Recent prior arrests	0.444	(2.477)	0.450	(4.072)
Prior ser. personal arrests	−0.080	(−0.878)	—	—
Prior ser. property arrests	0.181	(1.580)	0.173	(2.070)
Prior drug arrests	0.192	(0.690)	—	—
Prior drug arrests - possession	−0.395	(−1.429)	−0.216	(−2.083)
Prior convictions	0.046	(0.253)	—	—
Prior felony convictions	0.236	(1.469)	—	—
Prior misdemeanor conv.	−0.019	(−0.124)	—	—
Prior ser. property conv.	−0.140	(−1.029)	—	—
Prior drug convictions	0.243	(0.941)	0.318	(2.821)
Prior drug convictions - possession	0.023	(0.091)	—	—
Prior FTA - felony	−0.120	(−0.897)	—	—
Prior FTA - misdemeanor	0.069	(0.500)	—	—
Outstanding warrants, 0 vs. 1	0.343	(2.828)	0.300	(3.455)
Positive for marijuana[a]	0.003	(0.000)	—	—
Positive for cocaine	−0.164	(−1.003)	—	—
Positive for either	0.439	(2.316)	0.325	(2.594)
Positive for both	0.012	(0.088)	—	—
Hazard rate (detention)	−1.425	(−0.726)	—	—
y intercept	1.172	(−1.162)	−1.755	(−11.240)
Log likelihood	−546.269		−552.668	
Goodness of fit Chi-square	1007.503		1020.302	
P value	0.998		0.999	
DF	1141		1161	
Pseudo R^2 ($R^2 = c/(N+c)$)	0.427		0.430	
N	(1350)		(1350)	

[a] Term did not pass tolerance test.

Miami, a jurisdiction characterized by different patterns of drug abuse among defendants from those studied in New York and Washington, D.C., would support the claim of proponents of drug testing at the bail stage. Our investigation thus became an empirical question of predictive analysis. Compared to a court's current predictive ability based on information from a defendant's background,

TABLE 20

LOGIT MODELS OF REARREST, DADE COUNTY FELONY DEFENDANTS, JUNE-JULY, 1987: WITH DRUG TEST RESULTS; WITH HAZARD RATE (NOT TESTING)

	Model VIA		Model VIB	
Independent Variables	Coeff.	t-value	Coeff.	t-value
Burglary charges	0.106	(0.977)	—	—
Injury charges	−0.045	(−0.273)	—	—
Assault charges	−0.079	(−0.439)	—	—
Theft charges	0.130	(1.264)	0.179	(2.159)
Drug charges, any	0.008	(0.071)	—	—
Age, 30 or less vs. over 30	−0.098	(−1.141)	—	—
Self-reported substance abuse, past year	0.002	(0.014)	—	—
Prior arrests	0.038	(0.179)	—	—
Recent prior arrests	0.421	(2.380)	0.506	(4.781)
Prior ser. personal arrests	−0.071	(−0.727)	—	—
Prior ser. property arrests	0.143	(1.410)	—	—
Prior drug arrests	0.172	(0.622)	—	—
Prior drug arrests - possession	−0.385	(−1.394)	−0.222	(−2.145)
Prior convictions	0.043	(0.238)	—	—
Prior felony convictions	0.181	(1.278)	—	—
Prior misdemeanor conv.	−0.026	(−0.173)	—	—
Prior ser. property conv.	−0.125	(−0.890)	—	—
Prior drug convictions	0.239	(0.926)	0.361	(3.221)
Prior drug convictions - possession	0.028	(0.109)	—	—
Prior FTA - felony	−0.135	(−1.018)	—	—
Prior FTA - misdemeanor	0.070	(0.507)	—	—
Outstanding warrants	0.342	(2.813)	0.302	(3.480)
Positive for marijuana[a]	0.003	(0.000)	—	—
Positive for cocaine	−0.163	(−0.985)	—	—
Positive for either	0.434	(2.284)	0.335	(2.679)
Positive for both	0.010	(0.112)	—	—
Hazard rate (not testing)	−1.132	(−0.282)	—	—
y intercept	−1.691	(−2.387)	−1.717	(−10.810)
Log likelihood	−546.492		−552.536	
Goodness of fit Chi-square	968.365		980.453	
P value	0.954		0.968	
DF	1044		1064	
Pseudo R^2 ($R^2 = c/(N+c)$)	0.418		0.421	
N	(1350)		(1350)	

[a] Term did not pass tolerance test.

prior criminal history, and present case(s) and criminal charge(s), how much predictive ability would testing information add?

We documented a pervasive use of drugs among felony defendants in Dade County during the 1987 sample period. A large majority tested positively, mostly for cocaine. Prior to any multivariate modeling of the role of drug abuse in the failure-to-appear and rearrest problems, we first measured the extent of drug testing among Dade County felony defendants and, to some extent, the reliability

and validity of those test results. We investigated the accuracy of test results in a number of ways, including blind split-specimen testing and confirmation testing using GC/MS. Furthermore, we contrasted the results that would be produced employing either of two screening technologies, RIA and EMIT. Our results show overall consistency between technologies, with slight differences in the classification of defendants as positive or negative. We noted inconsistent results when samples were split, and tested using RIA in a small proportion of cases. We found not inconsequential false positive and false negative rates when RIA screening results were confirmed using GC/MS. If one's perspective is that of a state official arguing that, as a rough tool, drug test results are mostly accurate, then that is probably true. If, however, one's perspective is that of a defendant who has been "misclassified" in from three to eighteen percent of the cases, then the error rate involved in drug testing would appear to be large. We are unable to say whether the error rate produced was due largely to technology or to human processing problems. In our work, we were made aware of both.

In investigating the relation between positive testing for drug use among Dade County felony defendants and pretrial misconduct, variously measured, we found notably weak but statistically significant relationships at the bivariate level, ranging from a low correlation (phi) of .06 between cocaine testing and FTA, and a not much higher correlation of .11 between testing positively for cocaine or marijuana and defendant rearrest during pretrial release. When we exercised controls through multivariate analysis, we could report no surviving relationship between drug abuse and failure to appear. A significant relation did survive controls in the analysis of both rearrest and rearrest for serious crimes against the person. In this regard, our findings comport both with the findings of Belenko and Mara-Drita and of Smith *et al.*

A. THE STRENGTH OF THE RELATIONSHIP AS A RATIONALE FOR IMPLEMENTING TESTING AT THE BAIL STAGE

One might argue, however, that although we have found an independent or "incremental" role for drug test results in the prediction of defendant rearrest (measured generally and as rearrests for serious crimes against the person), we have not addressed fully the hypothesis that drug test results would add notably to the ability to predict flight and/or crime among released defendants. We have concluded, absent a statistical relationship, that in Dade County, knowledge of a defendant's drug abuse at arrest would help little in the assessment of his or her likely failure to appear at subsequent

court proceedings. In the analysis of rearrest, we have found a "significant" role for drug test results, but we have not asked whether the models including such an effect were *notably* better than those without.

If the assumptions about the empirical relation between drug use (shown via drug testing) and pretrial crime and flight are that drug testing programs would tap a powerful relationship and provide strongly predictive information not otherwise available to the bail judge or pretrial services staff, then the Dade County results may not meet that standard. If the question asked by the research is altered to whether drug testing information *could* play a role in a predictive classification in which it added an "increment" of predictive power, then the answer is perhaps.[102]

Table 21 summarizes the findings of the various attempts to develop models predictive of defendant misconduct with and without knowledge of defendant drug abuse as shown through booking stage drug tests. Although imperfect, "pseudo" R^2 measures are available which allow a comparison of the relative power of logit models in a fashion roughly analogous to variance explanation in linear regression.[103] We have calculated one such R^2 to compare logit models in Table 21.[104] Using this measure, we find that nonsignificant drug test variables added to the R^2 of the FTA equation. Comparing analyses of rearrest and serious person rearrest with and without drug test results, we find a small increase in the "pseudo" R^2, ranging from about .02 to .06. From these comparisons, we cautiously conclude that although the models with the drug test information may be somewhat more powerful, it is fair to say they do not represent a substantial leap in predictive discrimination.

Another way to address the question of the magnitude of the contribution made by drug testing information is to ask how well each model (with and without drug information) classifies defendants according to risk of rearrest. In fact, rather than viewing the question as involving an improvement in prediction of defendant

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102 But, then, we would also have to make sense of the finding reported in Tables 6 and 8 that more important to prediction than the results of testing was knowledge of the fact of whether the defendants did or did not test (defendants who did not test showed lower odds of crime or flight).

103 *See, e.g.*, Berk, *supra* note 96; J. ALDRICH & F. NELSON, LINEAR PROBABILITY, LOGIT, AND PROBIT MODELS (1984).

104 The pseudo R^2 we use is calculated as the goodness of fit chi square/the goodness of fit chi square + N. *See* ALDRICH & NELSON, *supra* note 101. Of course, these measures have important limitations, although they are perhaps most useful when comparing analyses based on the same sample. The pseudo R^2s for the modeling of serious person rearrests are not presented in Table 21; instead consult Tables 11 and 12 *supra*.

TABLE 21

SUMMARY OF PREDICTIVE ANALYSES OF FAILURE-TO-APPEAR (FTA) AND REARREST DURING PRETRIAL RELEASE, DADE COUNTY FELONY DEFENDANTS, JUNE-JULY 1987: THE EFFECTS OF DRUG TESTING INFORMATION AND OF CORRECTIONS FOR SELECTION BIAS

Pretrial Misconduct	Without drug test results	With drug test results	Interactions: With drug test results	Hazard rate (detention): Without drug test results	Hazard rate (detention): With drug test results	Hazard rate (not testing): With drug test results
FTA	Model IB:	Model IIB:	Model XIIB:	Model IIIB:	Model IVB:	Model VB:
(no v. yes)	Assault charges (-)	Assault charges (-)	—	Assault charges (-)	Assault charges (-)	Assault charges (-)
	Sex	—	—	Sex	—	—
	Self-reported drug use (past year)	Self-reported drug use (past year)	Assault charges (-)	Self-reported drug use (past year)	Self-reported drug use (past year)	Self-reported drug use (past year)
	Outstanding warr.	Outstanding warr.	—	Outstanding warr.	Outstanding warr.	Outstanding warr.
	Not testing (no v. yes) (-)	*Drug tests results N.S.*	—	*Not testing (-)*	*Drug test results N.S.*	*Drug tests results N.S.*
	—	—	Self-reported drug use (past year)	—	—	—
			—	Hazard rate (detention) N.S.	Hazard rate (detention) N.S.	Hazard rate (not testing) N.S.
			—			—
			Outstandingd warr.			
			Drug tests results N.S.			
			Interactions N.S.			
"Pseudo R^2"	0.169	0.221	0.195	0.268	0.316	0.306
REARREST	Model IB:	Model IIB:	Model IIIC:	Model IVB:	Model VB:	Model VIB:
(no v. yes)	Age (-)	—	Age (-)	Age (-)	—	—
	Burglary charges	—	—	Burglary charges	—	—
	Theft charges	—	—	Theft charges	—	Theft charges
	Recent prior arrests	Recent prior arrests	—	Recent prior arrests	Recent prior arrests	Recent prior arrests
	—	Prior serious property arrests	Recent prior arrests	—	Prior serious property arrests	—
	—	Prior drug arrests possession (-)	Prior serious property arrests	—	Prior drug arrests - possession (-)	—
	Prior drug arrests possession (-)	—	Prior drug arrests - possession	—	—	Prior drug arrests - possession (-)
	Prior convictions	—	—	Prior convictions	—	—
	—	Prior drug conv.	—	—	Prior drug conv.	Prior drug conv.
	Prior drug conv.	Outstanding warr.	—	Outstanding warr.	Outstanding warr.	Outstanding warr.
	Outstanding warr.	*Positive: marijuana or cocaine*	Prior drug conv.	*Not testing (-)*	*Positive: marijuana or cocaine*	*Positive: marijuana or cocaine*
	Not testing (-)	—	Outstanding warr.	—	Hazard rate (detention) N.S.	Hazard rate (not testing) N.S.
	—	—	*Positive: marijuana or cocaine*	Hazard rate (detention) N.S.		
	—	—	*Age X Positive: marijuana or cocaine (-)*			
"Pseudo R^2"	0.360	0.403	0.348	0.409	0.430	0.421

performance during pretrial release, the question might be more usefully framed in terms of predictive (or risk) classification. Does knowledge of defendant drug abuse improve our ability to classify defendants according to their relative risk of flight or rearrest? Although development of a risk classification can be more involved than what we can present here,[105] the basic question is whether the independent variables in the logit models can be used to group defendants into classes ranging from relatively lower to relatively higher probabilities of misconduct, and also differing clearly from one another in their probability of misconduct during release.

Table 22 groups defendants into five categories according to their predicted probability of rearrest during release (.15 or less; .16-.20; .21-.25; .26-.30; and .31 or higher) according to the weights assigned independent variables in the logit models without and with drug test information. Comparison of the distributions of these two classifications shows the principal difference to be that the classification with drug results (XIIC) would place proportionately fewer defendants into the lowest risk category (risk group 1) and more defendants into the highest risk categories (risk groups 4 and 5).[106]

Table 22 also shows how well the predicted probabilities of rearrest under the two models compare with the observed rearrest rates in each group. The two classifications appear to be related to actual rates of rearrest at similar magnitudes (tau c=.20 in each case). However, model IB shows predicted ranges of probability of rearrest (expected rates) that correspond with the actual rates in three of the five classes, while model IIIC shows such a correspondence in only in two classes. When mean cost ratings (MCRs) were calculated,[107] the two models were quite similar in predictive power

105 *See, e.g.*, Brennan, *Classification: An Overview of Selected Methodological Issues*, in GOTTFREDSON & M. TONRY, PREDICTION AND CLASSIFICATION: CRIMINAL JUSTICE DECISIONMAKING 201 (1987).

106 Ordinarily, this would be only the point of departure in classification analyses. Scores of defendants on the independent variables (corresponding to predicted probabilities of pretrial misconduct) would be used to select cutting points with the effect of redefining group membership until the best classification could be found. Of course, because each model may have different optimal cutting points, this classification would not be directly comparable. (Defendants would be classified differently because different group boundaries would have been employed under the two models.) Thus, for the purposes of this discussion, we have adopted the convention that group membership in the predictive classifications would be determined by given ranges of predicted probabilities. Thus, we can compare defendants predicted under the first model to have a probability of from .00 to .15 of being rearrested during pretrial release, with defendants predicted to have the same probability under the second model. The different treatment of defendants, in this way, cannot be explained merely by different cutting points, since the cutting points are the same.

107 Berkson, *Cost Utility as a Measure of Efficiency of a Test*, 42 J. AM. STATISTICAL ASSOC.

TABLE 22

EXPECTED AND OBSERVED PERCENT REARRESTED AMONG DADE COUNTY FELONY DEFENDANTS, JUNE-JULY, 1987: MODEL IB (WITHOUT DRUG TEST RESULTS) AND MODEL IIIC (WITH DRUG TEST RESULTS AND INTERACTIONS)

Model	Expected percent with rearrest	Number of defendants	Percent of defendants	Observed percent with rearrests	Observed percent pos. for cocaine
Model IB - without drug test results					
Total		1,808	100.0	15.5	(74.7)
Group 1	0-15	458	25.3	6.3*	(58.5)
2	16-20	391	21.6	8.4	(67.8)
3	21-25	500	27.7	16.2	(76.9)
4	26-30	268	14.8	26.9*	(87.1)
5	31 or higher	191	10.6	34.0	(89.7)
X^2 121.06, 3 DF, p=≤0.000					
Tau C = 0.20		MCR = 0.39			(Tau C = 0.25)
Model IIIC - with drug test results					
Total		1,355	100.0	16.1	(n/a)
Group 1	0-15	219	16.1	4.6*	(n/a)
2	16-20	291	21.5	9.6	(n/a)
3	21-25	338	24.9	12.7	(n/a)
4	26-30	306	22.6	22.9	(n/a)
5	31 or higher	201	14.8	33.3*	(n/a)
X^2 88.11, 3 DF, p=≤0.000					
Tau C = 0.20		MCR = 0.37			

* Within predicted range.

(Model IB's MCR=.39, Model IIC's MCR=.37).

Models could group similar proportions of defendants into lower versus higher risk groups, of course, while treating the defendants quite differently. Thus, Table 23 compares the implications of the two classifications from another perspective, the extent to which defendants would be ranked differently under the two systems. First, a glance at the diagonal cells shows that only fifty-six percent of defendants are classified similarly (placed in the same predicted probability categories) by the two classifications. From the perspective of the Model IB classification (without drug testing), the Model IIIC classification would have the effect of placing about thirty-five percent of all defendants in higher risk categories and nine percent of all defendants in lower risk categories. From the perspective of the Model IIIC classification (with drug test results),

246 (1947); Duncan, Ohlin, Reiss & Stanton, *Formal Devices for Making Selection Decisions*, 58 AM. J. SOCIOLOGY 573 (1952); Inciardi, Babst & Koval, *Computing Mean Cost Ratings (MCR)*, 10 J. RES. IN CRIME AND DELINQ. 22-28 (1973); Gottfredson, *Accuracy of Prediction Models*, in CRIMINAL CAREERS, *supra* note 8.

TABLE 23

THE COMPARATIVE CLASSIFICATION OF DADE COUNTY DEFENDANTS BY REARREST MODELS IB (WITHOUT DRUG TEST RESULTS) AND IIC (WITH DRUG TEST RESULTS, INTERACTION)

Rearrest Model IB (without drug test results

Expected percentage to be rearrested

Model IIIC (with drug test results, interactions)

Expected percentage to be rearrested	0-15	16-20	21-25	26-30	31 or higher
0-15	(216) 11.8	(55) 3.0			
16-20	(179) 9.8	(154) 8.4	(14) 0.8	(1) 0.1	
21-25	(3) 0.2	(135) 7.4	(284) 15.5	(42) 2.3	(3)
26-31		(3) 0.2	(210) 11.5	(163) 8.9	(49) 2.7
31 or higher			(1) 0.1	(116) 6.3	(199) 10.9

	N	Percent
Total Defendants	1,827	100.0
Total Agreement (diagonal cells)	1,016	55.6
Total Disagreement (off diagonal cells)	811	44.4
Model IB ranks higher	363	19.9
Model IB ranks lower	448	24.5
Model IIIC ranks higher	647	35.4
Model IIIC ranks lower	164	9.0

the Model IB classification would have nearly an opposite effect, resulting in the placement of twenty-five percent of all defendants in a lower risk and twenty percent in a higher risk category.[108]

Which classification system is the most desirable? If we were concerned only with empirical issues, we would want to choose the "most accurate" one. The choice in the prediction of rearrests for serious person crimes would be more clear cut: the model with drug test information is rated as more helpful in differentiating likely pretrial recidivists from non-recidivists. Given similar levels of "accuracy" in the models for general rearrest during pretrial release, we would want to consider the consequences of the different treatment of defendants by the classifications, not only in the use of urine specimens in compiling the risk-relevant data, but also in considering the conditions of release or likelihood of detention associated with the different risk classifications.

Based on these findings from predictive and classification analyses, we find little to differentiate the models with and without drug testing information for "accuracy." The slight advantage apparently associated with the drug test model seen in the pseudo R^2 in predictive analyses of rearrest is open to question when classification analyses are considered. Because the empirical finding of a slightly improved predictive effect for drug test results does not appear to translate into a clear advantage in developing risk classifications based on the Dade County felony data, it is likely that the issue of the utility of drug testing at the bail stage must be resolved from perspectives other than merely its relative predictive power. Thus, a variety of other analytic perspectives, such as desirability, constitutionality, fairness, and/or the costs and benefits of the program, might prove more salient.[109] Given the scarcity of local funding for

[108] The same analysis was repeated for models of rearrest for serious crimes against the person—arguably the public safety outcome of greatest concern at the bail stage—but the results are not presented here due to limitations of space. Although the model with drug test results showed a higher coefficient of association with serious person rearrests (tau c=.16 compared to a tau c=.08 for the other model), the predicted probabilities corresponded to actual outcomes in only one of five risk categories, compared to two of four risk categories under the model without drug test results. The MCR for the model without drug test results (.25), however, was notably weaker than that of the model with drug test results (.45), indicating improved predictive power with the addition of drug test information in the model. These two models would classify defendants similarly (place them in similar probability categories) in only 44% of all cases. The model of serious person rearrest without drug test information would classify the remaining 56% of defendants in lower risk categories than the model incorporating drug test information. That model would classify 56% of defendants as higher risk than the model without drug test results.

[109] For an excellent discussion of the kinds of program costs associated with drug testing programs at the pre-bail stage, see J. CLARKE, *supra* note 28.

court programs generally, and the expense associated with the establishment and operation of drug testing programs,[110] the question of the utility of drug testing may be decided practically, on the basis of fiscal concerns.

B. THE ROLE OF DEFENDANT DRUG USE INFORMATION IN IMPROVING THE BAIL/PRETRIAL RELEASE DECISION

At a very basic level, and without regard to questions of privacy rights of the pretrial accused, fairness and costs, the Dade County drug testing study has produced findings of importance to bail stage determinations. We believe that the finding of a statistical relation between drug test results and defendant rearrest during pretrial release should not divert attention from the simpler and more powerful finding that nearly all felony defendants (more than eighty percent) entering the criminal process in Dade County, Florida, apparently were using controlled substances at the time of their arrest. Whether or not it is a predictor of pretrial flight or crime, whether a cause or a mere correlate, the prevalence of drug use among defendants is in itself a troublesome finding. Given the widespread use of cocaine among Dade County defendants during the study period in 1987 in particular, it would be hard to argue that this information—whether viewed as health or criminal justice planning data—should not be taken into consideration in supervising or treating defendants on release. Drug abuse among persons falling within the jurisdiction of the criminal justice system is pervasive.

If our assignment had been somewhat different, for example, to locate subcategories of defendants for the purposes of treatment (assuming a renaissance in the availability of treatment resources), we could argue that these data have permitted analysis of drug use on defendants in a way rarely possible. In fact, we could argue that these data could facilitate development of empirically derived risk classifications based on probable drug use that would eliminate the need for drug testing data themselves.

Table 22 above made a prima facie case for the development of such a classification when it revealed (last column on the right) that the empirical model of defendant rearrest (without drug test results) also rank-ordered defendants reasonably well according to the likelihood that they would test positively for cocaine. Although this particular classification locates no category in which a minority of defendants would test positively (or in which a majority would not be drug users), it does locate a category (group 1) with a likelihood

110 *Id.*

of testing positively for cocaine considerably lower than the base rate of felony defendants in Dade County overall (about seventy-five percent).[111] (MCR=.40)

Table 24 shows the results of efforts to model cocaine use among felony defendants. Using the fourteen independent variables included in the final model, we scored and grouped defendants according to their relative probability of positive testing for cocaine. Table 25 displays the results of this exercise, showing four groupings of defendants differing in observed rates of cocaine use, ranging from a low of forty-four percent of defendants in risk group 1 to a high of ninety-four percent of defendants in risk group 4 (MCR=.31). (Note that we are able to identify at least one group in which drug use was in the minority.) Thus, in this preliminary analysis, we have been able to use information generally available to the court at the time of the bail decision to classify defendants according to their presumptive drug use—without requiring drug testing to actually determine whether it is so or not. The point of this illustration is that defendants could be targeted for supervisory or treatment approaches during pretrial release without implementing a systematic drug testing program of arrestees. This finding suggests that we could develop a classification based more directly on the prediction of likely drug use that builds on the kind of information currently available from pretrial services in advance of the bail decision. It could be improved by structured bail-interview questions designed to reveal the kind and frequency of drug use as well as other kinds of information related to disfunctionality in other realms that are pertinent to establishing effective conditions of release.

[111] It is interesting that predictors of pretrial crime are also predictors of drug use. *See supra* Section I.A. through I.C. This finding supports a spurious interpretation of the drug crime relationship.

TABLE 24

LOGIT MODELS OF POSITIVE COCAINE TESTS AMONG DADE COUNTY FELONY DEFENDANTS, JUNE-JULY, 1987

	Model I		Model II	
Independent Variables	Coeff.	t-value	Coeff.	t-value
Index offenses	−0.147	(−1.560)	−0.200	(−2.651)
Burglary charges	0.357	(3.664)	0.400	(4.752)
Weapons charges	−0.253	(−2.599)	−0.237	(−2.519)
Injury charges	0.086	(0.739)	—	—
Assault charges	−0.138	(−1.059)	—	—
Force	0.006	(0.050)	—	—
Drug charges	0.445	(5.358)	0.448	(5.774)
Non-white/White	−0.205	(−2.946)	−0.210	(−3.170)
Age	0.196	(2.795)	0.214	(3.169)
Marital status	−0.120	(−1.337)	—	—
Employment	−0.159	(−2.378)	−0.145	(−2.309)
Self-reported substance abuse, past year	−0.061	(−0.400)	—	—
THC use, past year	0.354	(1.871)	0.357	(2.741)
Cocaine use, past year	0.774	(3.843)	0.743	(4.895)
Prior FTAs	−0.057	(−0.227)	—	—
Prior arrests	0.233	(2.520)	0.305	(4.218)
Prior ser. personal arrests	0.022	(0.251)	—	—
Prior ser. property arrests	0.121	(1.289)	—	—
Prior drug arrests	−0.009	(−0.030)	—	—
Prior drug arrests - possession	0.191	(0.619)	0.274	(3.302)
Prior drug arrests - sale/manuf./delivery	0.288	(1.575)	0.405	(2.522)
Prior convictions	0.133	(0.738)	—	—
Prior felony convictions	−0.087	(−0.575)	—	—
Prior misdemeanor convictions	−0.047	(−0.296)	—	—
Prior serious personal conviction 0 or 1 vs. 2 or more	0.320	(1.055)	—	—
Prior ser. property conv.	0.233	(1.508)	0.332	(3.059)
Prior drug convictions	0.500	(1.249)	—	—
Prior drug convictions - possession	−0.268	(−0.676)	—	—
Prior drug convictions - sale/manuf./delivery 0 or 1 vs. 2 or more	0.174	(0.321)	—	—
Prior weapons convictions	−0.127	(−0.872)	—	—
Prior FTA - felony	0.112	(0.470)	—	—
Prior FTA - misdemeanor	0.344	(1.136)	—	—
Outstanding warrants	0.273	(1.841)	0.309	(3.292)
y intercept	3.315	(4.417)	2.742	(9.706)
Log likelihood	−777.841		−831.642	
Goodness of fit Chi-square	1149.448		1033.833	
P value	1.000		1.000	
DF	1325		1214	
Pseudo R^2 ($R^2 = c/(N+c)$)	0.403		0.362	
N	(1706)		(1820)	

TABLE 25

RISK CLASSIFICATION BASED ON THE PROBABILITY OF TESTING POSITIVELY FOR COCAINE AMONG DADE COUNTY FELONY DEFENDANTS, JUNE-JULY, 1987: OBSERVED PERCENTAGES WITH POSITIVE TESTS FOR COCAINE

Relative risk of positive test	Number of defendants	Observed percentages with positive tests
Total	1,820	74.7
Group 1 (lowest)	469	44.1
2	431	74.0
3	449	87.1
4 (highest)	471	94.1

$X^2 = 361.95$, 3 d.f., $p \leq 0.00$ Tau C = 0.41 MCR = 0.40

TABLE A1

LOGIT MODELS OF REARREST, DADE COUNTY FELONY DEFENDANTS, JUNE-JULY, 1987: COMPARISON OF 60-40 SPLIT-HALF CONSTURCTION (MODEL I) AND VALIDATION RESULTS (MODEL II): WITH DRUG TEST RESULTS

	Construction Sample Model IA		Validation Sample Model IB	
Independent Variables	Coeff.	t-value	Coeff.	t-value
Burglary charges	0.311	(3.236)	0.045	(0.355)
Age, lesss than 30 vs. over 30	−0.215	(−2.283)	−0.160	(−1.413)
Recent prior arrests	0.696	(5.463)	0.368	(2.625)
Prior drug arrests - possession	−0.223	(−1.862)	−0.046	(−0.328)
Prior drug convictions	0.259	(1.957)	0.393	(2.529)
Prior FTA - misdemeanor	0.357	(2.743)	0.161	(0.966)
y intercept	−1.709	(−9.554)	−1.283	(5.705)
Log likelihood	−438.716		−285.301	
Goodness of fit Chi-square	39.490		29.336	
P value	0.276		0.448	
DF	35		29	
Pseudo R^2 ($R^2 = c/(N+c)$)	0.032		0.045	
N	(1192)		(616)	