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SPECIFYING THE RELATIONSHIP BETWEEN ARRESTEE DRUG TEST RESULTS AND RECIDIVISM*

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ABSTRACT

Over the last fifteen years, research has confirmed what many criminal justice practitioners have long suspected: among criminal populations, drug use is a predictor of future criminal activity. Improved drug testing technology has significantly enhanced the ability to obtain information about an arrestee's recent drug use. However, the use of this information is a source of considerable debate. Some propose evidence of an arrestee's recent drug use should play a part in decisions about pretrial detention, including what requirements should be imposed as a condition of release. Opponents contend the results "predict" future criminality, but only because the drug test information duplicates other risk factors, such as the accused's prior criminal history. The opponents argue that widespread drug testing of arrestees is unnecessary because information on these other risk factors is readily available, cheaper and less intrusive. In this paper, we examine two empirical issues in this debate. First, are the results of drug tests at the time of arrest related to recidivism after the effects of other risk factors have been taken into account? Second, does the ability of drug test results to predict recidivism vary depending on an individual's other risk factors?

I. INTRODUCTION

There is little doubt today that individual drug use and crime

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are related. Research using a national probability sample of youth,[1] samples of addicts[2] and studies of different criminal justice populations[3] consistently show involvement in criminal activity varies directly with the prevalence, frequency and seriousness of drug use. Indeed, a recent review of the literature on substance abuse and offending notes: "Studies that vary dramatically in the locales and populations sampled, in the measures of crime and drug use, and in the cutting points and classifications of offenders and drug users have consistently found a strong association between the level of cocaine or heroin use and criminal behavior."[4]

While there is a general consensus among researchers and policymakers that serious drug use is associated with both current and future criminal behavior, considerable disagreement exists over whether using this relationship will improve criminal justice decisionmaking.[5] For example, there are spirited debates over the use of drug test results obtained at the time of arrest as an aid in making pretrial detention decisions.[6] These decisions include whether to release or incarcerate the accused until trial and, if release is allowed, whether to impose conditions during the pretrial period.

The debate over the use of drug test results is not about the use of risk assessment *per se*. Estimates of an accused's potential for flight or for committing additional crimes are routinely considered in setting bail or imposing other release conditions.[7] These risk as-

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[1] DELBERT S. ELLIOTT ET AL., MULTIPLE PROBLEM YOUTH: DELINQUENCY, SUBSTANCE USE, AND MENTAL HEALTH PROBLEMS (1989).

[2] BRUCE D. JOHNSON ET AL., TAKING CARE OF BUSINESS: THE ECONOMICS OF CRIME BY HEROIN ABUSERS (1985); John C. Ball et al., *The Day-to-Day Criminality of Heroin Addicts in Baltimore: A Study in the Continuity of Offense Rates*, 12 DRUG AND ALCOHOL DEPENDENCE 119 (1983).

[3] JAN M. CHAIKEN & MARCIA R. CHAIKEN, VARIETIES OF CRIMINAL BEHAVIOR: SUMMARY AND POLICY IMPLICATIONS (1982); MARY A. TOBORG ET AL., U.S. DEPARTMENT OF JUSTICE, ASSESSMENT OF PRETRIAL URINE TESTING IN THE DISTRICT OF COLUMBIA (1989); Brian Forst & Eric Wish, *Drug Use and Crime: Providing a Missing Link*, *in* VIOLENT CRIME IN AMERICA 84 (Kenneth R. Feinberg ed., 1983); Douglas A. Smith et al., *Drug Use and Pretrial Misconduct in New York City*, 5 J. QUANTITATIVE CRIMINOLOGY 101 (1989); Christy A. Visher & Richard L. Linster, *A Survival Model of Pretrial Failure*, 6 J. QUANTITATIVE CRIMINOLOGY 153 (1990).

[4] Eric D. Wish & Bruce D. Johnson, *The Impact of Substance Abuse on Criminal Careers*, *in* 2 CRIMINAL CAREERS AND "CAREER CRIMINALS" 52, 59 (Alfred Blumstein et al. eds., 1986).

[5] Eric D. Wish and Bernard A. Gropper, *Drug Testing by the Criminal Justice System*, *in* DRUGS AND CRIME 321-91 (Michael Tonry & James Q. Wilson eds., 1990).

[6] John S. Goldkamp et al., *Pretrial Drug Testing and Defendant Risk*, 81 J. CRIM. L. & CRIMINOLOGY 585 (1990); Wish & Gropper, *supra* note 5.

[7] *See* JOHN S. GOLDKAMP, TWO CLASSES OF ACCUSED: A STUDY OF BAIL AND DETENTION IN AMERICAN JUSTICE (1979); Norval Morris & Marc Miller, *Predictions of Dangerousness*, 6 CRIME & JUST. 1 (1985).

sessments typically consider factors such as the criminal history, community ties and employment stability of the accused. Furthermore, the criminal justice community has recently begun to explore whether the results of drug tests administered to persons at or shortly after arrest (hereinafter referred to as arrestee testing) may improve assessment of an accused's danger to the community or potential for flight.[8] But the possibility of obtaining and using drug test results in such a manner ignites controversy. The controversy encompasses constitutional and ethical questions about the practice of arrestee testing,[9] concerns about the accuracy of various testing procedures,[10] issues about the implementation of testing programs[11] and cost considerations.[12]

While recognizing these wide ranging areas of concern, the research reported in this paper focuses on what both proponents and opponents of arrestee testing agree is an essential empirical question: Is the information obtained from arrestee drug tests related to future criminality once other risk factors have been taken into account?

Opponents of arrestee drug testing often base their challenges on what might be called the "redundancy thesis." This thesis asserts that while a bivariate association between testing positive for drugs at the time of arrest and future offending may exist, this association is spurious and disappears after other predictors of recidivism have been taken into account.[13] Prior criminal history classifications most clearly exemplify the redundancy assertion. For example, if we assume that serious drug use and crime are positively associated, then persons who test positive for drugs at the time of arrest will tend to have more extensive criminal histories than those who do not test positive for drugs. To the extent this is true, infor-

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8 Douglas A. Smith et al., *Drug Use and Pretrial Misconduct in New York City*, 5 J. CRIM. L. & CRIMINOLOGY 585 (1990); Christy A. Visher & Richard L. Linster, *A Survival Model of Pretrial Failure*, 6 J. QUANTITATIVE CRIMINOLOGY 153 (1990).

9 *See* Mark H. Moore, *Purblind Justice: Normative Issues in the Use of Prediction in the Criminal Justice System, in* 2 CRIMINAL CAREERS AND "CAREER CRIMINALS" 314 (Alfred Blumstein et al. eds., 1986); Cathryn Jo Rosen & John S. Goldkamp, *The Constitutionality of Drug Testing at the Bail Stage*, 80 J. CRIM. L. & CRIMINOLOGY 114 (1989).

10 *See* CHRISTY VISHER, U.S. DEP'T OF JUSTICE, A COMPARISON OF URINALYSIS TECHNOLOGIES FOR DRUG TESTING IN CRIMINAL JUSTICE (1991). CHRISTY VISHER & KAREN MCFADDEN, U.S. DEP'T OF JUSTICE, A COMPARISON OF URINALYSIS TECHNOLOGIES FOR DRUG TESTING IN CRIMINAL JUSTICE (1991).

11 *See* Christy A. Visher, *Pretrial Drug Testing: Panacea or Pandora's Box?*, 521 ANNALS AM. ACAD. POL. & SOC. SCI. 112 (1992).

12 *See* BUREAU OF JUSTICE ASSISTANCE, U.S. DEP'T OF JUSTICE, ESTIMATING THE COSTS OF DRUG TESTING FOR A PRETRIAL SERVICES PROGRAM (1989).

13 Goldkamp et al., *supra* note 6.

mation provided by arrestee testing simply duplicates the information already available from the arrestee's criminal record and thus has little *independent* utility in predicting future misconduct.

Some prior research is relevant to this point. Studies in the District of Columbia have shown that persons testing positive for drugs at the time of arrest have a higher probability of being rearrested, average more rearrests and are rearrested more quickly than arrestees who did not test positive for drugs over the pretrial period.[14] Moreover, these differences are evident in both bivariate and multivariate analyses taking into account other factors associated with pretrial offenses.[15] Additional research in New York City[16] and Dade County, Florida,[17] also shows that arrestees who test positive for drugs have a higher probability of being rearrested during the pretrial period and that this relationship persists after other predictors of pretrial offending are considered.[18] Thus, the existing research reveals a consistent picture: those who test positive for drugs have a higher likelihood of engaging in future criminal activity. This relationship cannot be simply attributed to the fact that drug users possess non-drug risk factors in addition to those possessed by nonusers.

But this does not necessarily imply that the redundancy thesis is incorrect or misguided. While the relationship between testing positive for drugs and future criminality appears to be independent of other risk factors possessed by the individual, the *strength* of this relationship may vary based upon other risk factors. For example, among the subsample of arrestees with extensive criminal histories, drug test results may have limited predictive power because evidence of recent drug use duplicates the predictive power of other factors used to identify future offenders. In sum, the presence of other non-drug risk factors, such as an extensive criminal record, may make arrestee drug test results redundant and therefore not worth the effort to obtain and interpret. However, among arrestees with no prior criminal histories, drug test results may be a strong predictor of future offending because the absence of other risk fac-

14 TOBORG ET AL., *supra* note 3.

15 The other factors considered in these studies as control variables include age, education and employment status of the accused, the type of arrest charge, whether the arrestee is on probation or parole and the number of prior convictions. *Id.*; Visher & Linster, *supra* note 8.

16 Smith et al., *supra* note 8.

17 Goldkamp et al., *supra* note 6.

18 The control variables in these studies include those listed in note 15 and others such as the arrestee's marital and school status, sex, race and the number of prior arrests.

tors adds significance to the presence of a single risk factor, such as recent drug use.

While there has been some speculation about the differential significance of drug use in predicting future offending,[19] we are not aware of any empirical testing of the hypothesis that the association between drug test results and future offending varies depending upon other attributes of individual offenders. Using data from a sample of 1,284 persons arrested in the District of Columbia in 1990, the current paper provides a preliminary test of this proposition.

II. Data Used in the Current Research

Data used in this analysis were obtained from two sources: the District of Columbia Pretrial Services Agency (PSA) records and the National Institute of Justice's Drug Use Forecasting (DUF) program. The District of Columbia has employed pretrial drug testing since the 1970s; in 1984, it expanded the testing to include all D.C. arrestees with the PSA taking over responsibility for the testing program in 1984. PSA data contain detailed information on criminal history and drug tests results taken at the time of arrest. Additionally, the PSA data make possible the forward tracking of arrestees in order to measure their future criminality. The DUF data also contain drug test results from a sample of persons arrested, and include information obtained from arrestee interviews on items such as family and work status. The combined data contain the arrestees' demographic characteristics, arrest and charge information, prior criminal history, future offending and drug test results. Some descriptive information for the sample used in this research is shown in Table 1.

The PSA tests for five types of drugs: cocaine, opiates, methadone, Phencyclidine (PCP) and amphetamines. The DUF program tests for those drugs and five others: barbiturates, marijuana, methaqualone, Darvon and Valium. Based on preliminary examination of the marginal frequencies of positive tests, the analyses for this paper focuses on the test results for only three drugs: cocaine, PCP and opiates. Only these three drug test results were used because in this sample of arrestees, none of the other drugs were present in any more than 3% of the specimens and most had prevalence rates of 1 to 2%. The one exception to this was marijuana, which was detected in 7% of arrestees. We excluded marijuana test results

[19] Eric D. Wish et al., *Drug Abuse as a Predictor of Pretrial Failure-to-Appear in Manhattan*, U.S. Dep't of Justice, National Institute of Justice (January 1988).

TABLE 1
DESCRIPTIVE INFORMATION ON THE SAMPLE (N=1,284)

Median age	29.5	Primary charge type	
		violent/person	21.7
Percent male	72.6	property	24.6
		drug	21.9
Percent nonwhite	92.4	other	31.9
Percent with any prior offense	64.2	Percent felony	62.9
		Employment status	
Average number of prior offenses conditional on having priors	4.2	Full-time	30.7
		Part-time/odd job	20.3
		Unemployed	30.1
		Other	12.9
Percent positive for			
0 drugs	43.3	Marital status	
1 drug	40.9	Single	70.6
2 or more drugs	15.8	Married	8.9
		Separated/Divorced	13.3
Percent testing positive for		Common law	6.4
cocaine	53.3	Widowed	0.8
opiates	14.6		
PCP	5.6	Percent rearrested	38.6
Percent testing positive for cocaine among those testing positive for any drug	94.0		

because past research has not shown marijuana use to be related to future criminal behavior among criminal justice populations.[20]

Data in Table 1 show the frequency of positive test results for the three selected drugs. For example, 53% tested positive for cocaine, 14.6% tested positive for opiates and 5.6% tested positive for PCP. The dominance of cocaine as the drug of choice among persons arrested in D.C. is illustrated by the fact that of those testing positive for any drug, 94% tested positive for cocaine. Thus, as part of the following analysis, we assess whether testing for cocaine alone leads to similar or different conclusions about the relationship between drug use and future offending.

Information regarding subsequent arrests was collected until August 24, 1991. This resulted in an average follow-up time of thirteen months in which an arrestee could be rearrested. During this time, about 39% of persons in the sample were rearrested for a new

[20] *See, e.g.*, Wish & Johnson, *supra* note 4.

crime. There is a limitation inherent in these data. The data do not provide information on whether, or for how long, the court may have detained a person after arrest. Since D.C. judges may use the PSA arrestee testing results in setting release conditions, it is possible that the courts might release drug-negative defendants more quickly than their drug-positive counterparts. The practical consequence would be that drug-positive arrestees would experience less time-at-risk (i.e., non-jail time) in the follow-up period.

The implications of drug-positive arrestees experiencing less time-at-risk are manifold. If we assume that drug-positive and drug-negative arrestees are equally likely to commit a new crime on any given day in the follow-up period (*i.e.*, there is no relationship between drug use and crime), the reduced time-at-risk for drug-positive arrestees would lower the number of recidivist events relative to the drug-negative arrestees. The bias this would introduce into the analysis would attenuate the true relationship between the evidence of recent drug use and recidivism. For example, if we were to find that drug-positive arrestees had fewer recidivism events in the follow-up period than drug-negative arrestees, we could not be sure if this were attributable to the fact that drug users are less likely to recidivate or that drug-positive arrestees have less time-at-risk during the follow-up period. However, if drug-positive arrestees were found to have more recidivist events than drug-negative arrestees, we could be fairly confident that this difference was real and not artificial. Thus, the potential confounding between testing drug-positive and the amount of time-at-risk implies that the estimated association between testing positive for drugs and future offending in the PSA data will underestimate the true magnitude of this relationship.

III. Analysis

Table 2 presents data about the relationship between arrestee drug test results and prior criminal record. In addition to data for the entire sample of 1,284 arrestees, data for various sample subgroups are also shown. Among those testing negative for any of the three drugs examined in this study (i.e., cocaine, opiates or PCP), almost 52% have a prior record. For arrestees testing positive for any one of these drugs, there is about a 70% chance they will have a prior record. Finally, more than 81% of those testing positive for two or more drugs have a prior record. Percentage differences of this magnitude would occur less than one time in 100 by chance.[21]

[21] Significance levels reported in Table 2 are based on an analysis of variance model.

The column to the far right of Table 2 shows the average number of prior arrests also increases with the number of drugs for which an arrestee tests positive.

Once again, the relation between the average number of prior arrests and the number of drugs for which one tests positive at arrest is quite significant. The pattern of more extensive criminal histories among drug-positive arrestees is true not only for the entire sample but also for various subgroupings based on age, sex and employment status at the time of arrest. Thus, these data are consistent with the claim that there is a strong association between testing positive for drugs at the time of arrest and an individual's prior criminal record.

Despite the data's support of the redundancy thesis, the fact that testing positive for drugs is associated with more extensive prior criminal activity does not necessarily mean arrestee testing is of little use in differentiating between arrestees who are more likely to commit additional crimes and those who are not. To resolve this issue, we need to know whether—after controlling for differences in prior offending, age, sex and other factors related to recidivism—there is a relationship between drug test results and future arrests.

We used probit models to address this issue, with the results shown in Table 3. In each of these models, the dependent variable is whether the arrestee was rearrested for a new crime during the follow-up period. In addition to independent variables representing a number of non-drug factors conceptually related to recidivism, each model includes a different measure of drug use as another independent variable.

In Model I, whether the arrestee tested positive for cocaine is included as the drug-use variable. The results of this model show that those persons with more prior arrests, those who were currently charged with a property offense and those with longer times in the follow-up period are more likely to recidivate. Conversely, older arrestees and those with full or part-time employment are significantly less likely to be arrested for a new offense during the follow-up period. Over and above these effects, however, those who test positive for cocaine are significantly more likely to recidivate than those who test negative.

Model II uses a drug-use independent variable, coded as one (1) if the arrestee tests positive for *any* of the three drugs and zero (0) otherwise. These results are numerically similar and substantively identical to the findings of Model I.

Finally, Model III uses the number of drugs detected in the ar-

TABLE 2
RELATIONSHIP BETWEEN DRUG TEST RESULTS AND PRIOR RECORD

Group number of drugs detected	Percent with a prior arrest	Average number of prior arrests
All Cases		
0 (N=556)	51.8**	1.95**
1 (N=525)	70.7	2.75
2+ (N=203)	81.3	4.64
Females		
0 (N=105)	49.5**	1.76**
1 (N=180)	66.7	2.13
2+ (N= 67)	76.1	3.76
Males		
0 (N=451)	52.3**	2.00**
1 (N=345)	72.8	3.07
2+ (N=136)	83.8	5.07
Ages 16-24		
0 (N=264)	43.6**	1.01**
1 (N=144)	59.7	1.74
2+ (N= 37)	73.0	2.16
Ages 25-31		
0 (N=131)	58.8**	1.97**
1 (N=215)	79.1	2.90
2+ (N= 61)	78.7	3.56
Ages 32 and up		
0 (N=161)	59.6**	3.50**
1 (N=166)	69.3	3.42
2+ (N=105)	85.7	6.14
Employed full-time		
0 (N=193)	49.2**	1.67**
1 (N=146)	67.1	2.05
2+ (N= 55)	74.6	3.73
Employed part-time		
0 (N=108)	51.9**	1.77**
1 (N=109)	73.4	2.94
2+ (N= 44)	86.4	5.27
Other employment/unemployed		
0 (N=255)	53.7**	2.25**
1 (N=270)	71.5	3.05
2+ (N=104)	82.7	4.86

** $p < .01$

TABLE 3
PROBIT MODELS FOR SUBSEQUENT ARRESTS USING DIFFERENT MEASURES OF DRUG USE

	Model I		Model II		Model III	
Positive cocaine	.384	(4.85)*				
Any positive test			.345	(4.29)		
Number of positive tests					.215	(4.00)
Number of prior arrests	.066	(6.68)	.066	(6.75)	.065	(6.61)
Violent offense	.108	(.96)	.102	(.92)	.092	(.83)
Property offense	.249	(2.39)	.241	(2.32)	.217	(2.10)
Drug offense	−.051	(−.45)	−.053	(−.49)	−.078	(−.71)
Felony offense	−.175	(−2.07)	−.176	(−2.08)	−.189	(−2.23)
Months at risk	.036	(4.22)	.036	(4.26)	.036	(4.28)
Age	−.024	(−5.24)	−.025	(−5.31)	−.025	(−5.40)
Nonwhite	.009	(.06)	.042	(.29)	.071	(.48)
Female	−.141	(−1.48)	−.138	(−1.44)	−.130	(−1.36)
Married	−.028	(−.26)	−.021	(−.20)	−.028	(−.27)
Employed full-time	−.378	(−4.09)	−.381	(−4.13)	−.378	(−4.09)
Employed part-time	−.214	(−2.10)	−.210	(−2.08)	−.200	(−1.98)
Constant	−.207	(−.85)	−.222	(−.92)	−.173	(−.72)
Log-likelihood		−780.965		−783.559		−784.806

* t-values in parentheses

restee's urine specimen taken at the time of arrest as the measure of drug use. Again, the results are similar to the other models. Thus, regardless which of the three drug use measures employed with the PSA data, the results reveal a consistent picture: there is a clear and significant association between testing positive for drugs at the time of arrest and the probability of recidivism. Drug-positive arrestees are more likely to commit a new offense than those testing drug-negative.

The relationship between testing positive for drugs and future offending shown in Table 3 is consistent with other research. But does that relationship vary across subgroupings of individuals who differ in terms of other risk factors? To examine this question, we estimated the recidivism equation under Model I in Table 3 for nine different subgroups of arrestees.[22] The first of these analyses involved estimating the recidivism equation using only the subsample of arrestees with no prior arrests. The independent variables in this equation are the same as those in Model I from Table 3, with the exception that we excluded the number of prior arrests from the

[22] In the interests of space, the subgroup analyses are reported using only one measure of drug use: whether the arrestee tested positive for cocaine. In these data, 94% of arrestees who tested positive for any drug tested positive for cocaine, and the results shown in Table 3 indicate that the three different calibrations of drug test results (cocaine only, any drug and the number of drugs) have essentially the same relationship with the probability of recidivism.

analysis because all persons in the subsample had zero prior arrests. The first row of data in Table 4 shows a .555 probit coefficient of testing positive for cocaine. The second and third data columns give the estimated probability of recidivism, conditional on whether an arrestee tests negative or positive for cocaine.[23] The data column on the far right shows the overall probability of recidivism among arrestees in this subgroup. The results show that among the sample of arrestees with no prior arrests, about 16% of those who test negative for cocaine are predicted to recidivate, compared to 32% of those who test positive. Thus, among the subgroup consisting of arrestees with no prior criminal record, cocaine-positive arrestees are twice as likely to recidivate as cocaine-negative arrestees; this difference is statistically significant ($t=3.68$).

Among arrestees with three or more prior arrests, however, the result is different. In this group, about 44% of the cocaine-negative arrestees are predicted to recidivate, compared to 52% of those who are cocaine-positive. Moreover, this difference in the estimated probabilities of recidivism between drug-positive and drug-negative cases is not statistically significant ($t=1.46$).

The point to emphasize is not the specific estimates of the probability of recidivism within any given subgroup, but rather the pattern of probit coefficients between subgroups (*e.g.*, first-time offenders versus arrestees with three or more prior arrests). The probit coefficients capture the impact of cocaine use on recidivism. Larger probit coefficients indicate a higher probability of recidivism among arrestees who test cocaine-positive, relative to those who test cocaine-negative. Thus, while the probability of recidivism increases with an arrestee's prior record, regardless of whether the arrestee tests drug-negative or drug-positive, among first-time offenders both the probit coefficient's magnitude and t-value clearly indicate testing cocaine-positive is more influential in predicting recidivism in this subgroup than among arrestees with three or more prior arrests.

To further explore the predictive ability of drug use information in combination with other risk factors, we next estimated the recidivism equation for subgroups based on the arrestee's employment status. Results discussed above in conjunction with Table 3 reveal employment status is a risk factor for recidivism, with those

[23] The estimated probabilities of recidivism are calculated by multiplying the probit coefficients times the means of non-drug use independent variables and summing. This sum is then used as the upper limit of integration for a cumulative standard normal distribution. To obtain the probability of recidivism among drug-positive arrestees, the probit coefficient for cocaine-positive is added to the sum and the integration repeated.

TABLE 4
ASSOCIATION BETWEEN COCAINE TEST RESULTS AND SUBSEQUENT ARRESTS FOR DIFFERENT RISK GROUPS

	Probit coefficient for positive cocaine	Probability of recidivism given negative test	Probability of recidivism given positive test	Probability of recidivism
Prior arrests				
None	.555 (3.68)*	.156	.324	.254
One or two	.383 (2.72)	.323	.470	.417
Three or more	.202 (1.46)	.445	.526	.498
Employment				
Full-time	.524 (3.61)	.190	.361	.294
Part-time	.393 (2.12)	.259	.400	.356
Unemployed/other	.253 (2.18)	.394	.494	.455
Age				
17 - 24	.268 (1.98)	.382	.487	.427
25 - 31	.426 (2.83)	.281	.439	.396
32 and over	.539 (3.70)	.217	.404	.333

* t-values in parentheses

employed full-time less likely to recidivate than those employed part-time or unemployed. Thus, under the thesis that drug use is more predictive of future offending in the absence of other risk factors, we expect the effect of being cocaine-positive on recidivism should be strongest for those who are employed full-time and weakest among the unemployed. The data reported in the employment portion of Table 4 are consistent with that expectation. Among arrestees employed full-time, the probit coefficient for testing positive for cocaine is .524, compared to .253 among the unemployed. In terms of the probability of recidivism, cocaine-positive arrestees who are employed full-time are predicted to recidivate at almost twice the rate as cocaine-negative arrestees who are employed full-time (36.1% compared to 19%, respectively). Among unemployed arrestees, testing positive for cocaine is still a significant predictor of recidivism. However, the significance of the relationship between drug use and recidivism is less among unemployed arrestees than among arrestees who are employed full-time.

Finally, Table 4 also shows the results of the same kind of analysis using subgroups stratified by age. As indicated by the results presented earlier in Table 3, age is associated with a reduced likelihood of recidivism, the effect of testing cocaine-positive cocaine on

recidivism should increase with age. This is exactly what the data show.

IV. CONCLUSIONS

In summary, the main results from this analysis are that among persons arrested in the District of Columbia in 1990, the presence of drugs in a urine specimen taken shortly after arrest (i.e., drug-positive arrestee test results) is significantly associated with an increased probability that the person subsequently will be arrested for a new crime. This association persists even after other (non-drug) risk factors for recidivism, such as prior record, employment status and age, are taken into account. Furthermore, the strength of the association between drug use and recidivism varies with the presence or absence of the other risk factors. Specifically, arrestee drug test information is strongly related to recidivism among arrestees who, otherwise, are at lower risks of future offending.

The implications of these findings depend on the use of the information provided by arrestee drug testing. One possibility is to identify persons who could benefit from treatment programs or scheduled drug testing. There are provocative implications in the finding that differences in recidivism between those testing drug-positive and those testing drug-negative are most pronounced among novice offenders, employed and older arrestees. First, doing something effective about stopping the drug involvement of novice offenders, employed or older arrestees potentially offers the largest reduction in future criminality, because the association between drug use and recidivism is strongest among these individuals. Second, studies show that the effectiveness of drug treatment varies with individual attributes of drug users.[24] In particular, stable employment and minimal prior criminal involvement are client characteristics associated with more favorable treatment outcomes.[25] Thus, the findings reported here support a policy of diverting offenders who test positive for drugs but who are otherwise low risks for continued criminality into drug treatment programs.

But what about arrestees who possess other risk factors for recidivism and who also test positive for drugs? Our results show, among otherwise high-risk arrestees, testing positive for drugs is still associated with an elevated risk of recidivism, although this is

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[24] *See* ROBERT L. HUBBARD ET AL., DRUG ABUSE TREATMENT: A NATIONAL STUDY OF EFFECTIVENESS (1989); D. Dwayne Simpson et al., *Addiction Careers: Etiology, Treatment, and 12-Year Follow-Up Outcomes*, 16 J. DRUG ISSUES 107 (1986).

[25] HUBBARD ET AL., *supra* note 24; Simpson et al., *supra* note 24.

less true among otherwise low-risk arrestees. However, drug treatment literature is pessimistic about this group because unfavorable treatment outcomes are characteristically associated with criminal or employment histories.[26] Thus, it seems unlikely that treatment resources directed toward these otherwise high-risk arrestees would yield a significant reduction in future crimes.

In closing, the controversy surrounding the utility of drug testing programs is encouraging objective research that promises to help separate fact from opinion or intuition. It is now reasonably well established that among arrestees, those who test positive for drugs at the time of arrest have a higher probability of recidivism than those who test negative. It is equally clear that the results reported in this paper, showing the strength of this association varies systematically with the incorporation of other risk factors, need to be tested with other data sets. If future research confirms these results, criminal justice practitioners will be faced with the task of identifying and responding to the programmatic utility of drug testing for different populations of offenders.

[26] HUBBARD ET AL., *supra* note 24; Simpson et al., *supra* note 24.