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Deterrence theory has been repeatedly used to explain individuals' choices to commit vs. not commit crimes. Its utilitarian premise is that individuals will choose to commit or not commit crimes based on the certainty, swiftness, and severity of punishments. This study examines the perceived certainty of sanctions among offenders mandated into intensive probation and the effects of varying levels of perceived sanction certainty in deterring offenders from violating probation requirements. Data from an Intensive Supervision Probation program in New Jersey are used. Results support the salience of offenders' perceptions of sanction certainty on their intensive probation outcomes, and implications for policy are discussed.

Deterministic theories about law-abiding and lawbreaking behaviors have dominated explanations of crime and deviance for much of the first half of the twentieth century (Gottfredson and Hirschi 1990; Maxwell 1997). These included explanations such as Lombroso-Ferrero's *Criminal Man* (1911), Merton's *Strain* (1938), Sutherland's *Differential Association* (1947), or Cloward and Ohlin's *Differential Opportunity* (1960). Generally, these theories emphasized the development of criminal motivations through socialization within deviant subcultures, the failure of conventional socialization processes, psycho-dynamic problems, or external criminogenic drives generated by the social milieu (Maxwell 1997; Tittle 1980a; Tittle 1980b).

Within the last thirty years, however, these explanations have proven limited in explaining and preventing crime (Andenaes 1975; Glaser 1979). Particularly in the 1960s, rising crime rates, increasing drug use and general disorder led researchers who were interested in crime control to redirect their attention from searching for the seemingly elusive "causes" of crime to examining instead the utility of formal and informal sanctions in controlling crime (Maxwell 1997; Tittle 1980b). This paradigmatic shift was also fueled by well-publicized results of a study that challenged the utility of expensive rehabilitation and treatment programs for offenders, claiming these were ineffective in reducing crime rates (i.e., the famous "Nothing Works" by Lipton, Martinson, and Wilks 1975; Martinson 1974). The result of this study was an affront to then popular policies of preventing crime or managing offenders through treatment, policies that were

Sociological Inquiry, Vol. 70, No. 2, Spring 2000, 117–36 ©2000 by the University of Texas Press, P.O. Box 7819, Austin, TX 78713-7819 direct legacies of the deterministic paradigms of offending behaviors (Maxwell 1997; Palmer 1992).

The renewed focus on using threats of sanctions to control behavior derives from the age-old utilitarian philosophy of the Classical School of Criminology and underlies deterrence theory. The Classical School views human beings as rational individuals who efficiently weigh the costs and benefits of their actions in attaining desired goals (Akers 1994; Gottfredson and Hirschi 1990; Zimring and Hawkins 1973). It posits that "actions are taken and decisions are made by persons in the rational exercise of free will" (Akers 1994). As a derivative of the Classical School, deterrence theory postulates that individuals choose to obey or violate the law by making rational calculations about the potential costs and benefits of such acts (Bridges and Stone 1986). The deterrence model argues that once legal sanctions are applied, individual rule-breaking will desist among those directly sanctioned (specific deterrence) and among those who were only aware of the sanctions (general deterrence). Individuals will be deterred from committing crimes because they dislike the intrinsic or extrinsic consequences associated with the sanctions or because they fear the potential applications of these costly sanctions on their future misconduct (Maxwell 1997).

The Relevance of the Deterrence Philosophy in Crime Policies

Deterrence is the theoretical principle upon which many aspects of the justice system are grounded. For example, Mueller (1977) argued that the sole purpose of punishments levied by criminal laws is to deter future crimes. Similarly, Zimring and Hawkins (1973) and Morris (1966) asserted that the deterrent and preventive elements of criminal law are its primary and most important postulates.

Currently, the deterrence doctrine dominates criminal justice philosophy and practice (Maxwell 1996; Sabol and Lynch 1997; Tonry 1995; Wichiraya 1996). This is especially seen in augmented prison terms for many types of offenses (e.g., drug offenses, offenses committed with firearms), in mandatory sentences or enhanced penalties (Maxwell 1995; Sabol and Lynch 1997), in increasing numbers of juveniles waived to adult courts, and in "three strikes" programs (Maxwell 1996). In addition, the justice system in the United States has increased the likelihood of detection of law violators. Policies ranging from more police officers on the streets to electronic monitoring of offenders in the community (Byrne and Pattavina 1992) and more intensive probation programs (Petersilia, Turner, and Deschenes 1992b) indicate to potential violators that their behaviors will not go unchecked. Contrary to the rehabilitative approaches of addressing crimes that were prominent in the 1960s, these policies are premised on deterrence and the belief that increasing punishment will make crime commission less profitable, thus decreasing crime rates. However, evidence of the deterrent effects of sanctions have been meager (Blumstein, Cohen, and Nagin 1976;

Piliavin, Thorton, Gartner, and Matsueda 1986; Paternoster 1987). Austin, Jones, and Kramer (1994), for example, recently examined crime trends in four states that had sentencing enhancements and found these trends to be similar to national crime trends and to those states without sentencing enhancement laws. Similarly, Wichiraya (1996) examined thirty-one states that have implemented sentencing enhancement laws but found no significant decreases in crime rates in most of these states and even noted increases in some. Moreover, Petersilia et al. (1992b) compared the re-offense rates of offenders given intensive probation and those given regular probation, and found higher rates of re-offense among the former. Several other researchers have examined the effects of one or more recent punitive trends on crime rates and on recidivism rates of offenders, and found no substantial effects of enhanced penalties were related to increased recidivism (Tonry 1996). Others found that enhanced penalties were related to increased recidivism (see Fagan 1994; MacKenzie 1994).

Certainty of Punishments and Deterrence

Driven by many research results that have failed to support the deterrent elements of sanctions, scholars in the last few years have re-examined and refined the measures of deterrence (Paternoster 1987; Williams and Hawkins 1986) to include not only the severity of the punishment, which refers to the extent of unpleasant consequences resulting from a criminal sanction, but also the celerity or swiftness of punishment and the certainty of punishment (Erickson, Gibbs, and Jensen 1977). Celerity refers to the proximity of the dispensation of a sanction following the commission of a crime (Clark 1988), and certainty refers to the probability that a punishment will ensue following commission of a crime (Gibbs 1975; Meier 1978; Zimring and Hawkins 1973). Several studies have examined each of these dimensions (see, for example, Paternoster 1987; Paternoster, Saltzman, Waldo, and Chiricos 1983; Schneider and Ervin 1990; Williams and Hawkins 1986) and found that compared to the other dimensions of deterrence, *certainty* of punishment is a more forceful factor in the calculation of costs and benefits associated with criminal acts. Grasmick and Bryjack (1980) and Erickson et al. (1977), for example, found more clear and consistent findings across studies that examined the certainty of sanctions in deterring crimes. Likewise, Beccaria (1963) noted that the certainty of punishment will always make a stronger impression than the fear of more severe sanctions that is combined with the hope of impunity. Singer (1970) and Gottfredson and Hirschi (1990) further contended that offenders are often "presently oriented" such that their behaviors are more likely affected by consequences of crimes that are immediate and certain rather than severe but uncertain. In their exhaustive review of deterrence research, Blumstein, Cohen and Nagin (1978) also contended that deterrence first depends on the perceived certainty of punishments and then on

consideration of the severity of punishments. They further contended that the lack of evidence supporting the effects of punishment severity on deterrence may be due to the lack of attention to the certainty dimension. That is, severity may matter but "only when persons believe there is a high probability that they will receive that punishment" (1978). It is clear from previous research that certainty factors play a central role in deterrence and warrants a closer examination. This paper focuses specifically on the role that certainty plays in deterring probation violations.

Testing the Certainty Dimension of Deterrence

The certainty dimension comprises two related probabilities: the objective probability of the sanction application and the perceived probability of the sanction application (Ekland-Olson and Kelly 1993; Gibbs 1982). The first series of studies that examined the role of certainty in deterring crime have relied exclusively on the objective measures of certainty, such as number of arrests and number of convictions. Certainty was then calculated by dividing the number of arrests or convictions by the number of reported crimes (Antunes and Hunt 1978; Gibbs 1982). The effectiveness of deterrence was determined based on how these aggregate numbers negatively related to crime rates across geographical areas (Grasmick and Bryjack 1980; Klepper and Nagin 1989; Piliavin et al. 1986). Though informative, these studies were limited when predicting individual behaviors due to the aggregate measures that were used. To address this limitation, the next wave of studies utilized surveys of individuals, first crosssectionally and then later longitudinally, asking individuals about their perceptions of punishment certainty and their past or future criminal activities (Klepper and Nagin 1989; Paternoster 1987). These studies then correlated individuals' perceptions of punishment certainty with their self-reported criminal activities (Klepper and Nagin 1989; Paternoster 1987; Paternoster et al. 1983; Schneider and Ervin 1990; Williams and Hawkins 1986). Individual-level analysis was thought more profitable in analyzing perceptions of individuals about sanction certainty because it permitted a more direct examination of the sociological and the psychological correlates of these perceptions (Cohen 1978).

Results of cross-sectional studies showed negative associations between perceptions of sanction certainty and criminal behavior (Paternoster et al. 1983; Schneider and Ervin 1990), lending support for the effect of perceived certainty on criminal behavior. However, these cross-sectional studies were also limited in at least one respect—their inability to sequentially order the measurements of perceived certainty and individual criminal behaviors (Piliavin et al. 1986). In other words, respondents were asked to give current estimates of certainty on their involvement in *prior* criminal activities (Paternoster 1987; Paternoster, Saltzman, Waldo, and Chiricos 1982a). Paternoster (1987) noted that this temporal difficulty may have resulted in researchers finding a "deterrent effect" when in fact what they were finding was an "experiential effect." Experience, Paternoster (1987) claimed, is an important but often overlooked factor in assessing risk in that persons with previous violations may subsequently have lower estimates of risk than those less experienced or without experiences.

To address the issue of temporal ordering, subsequent studies have used longitudinal samples to examine the effect of perceived certainty on criminal behavior (Paternoster, Saltzman, Waldo, and Chiricos 1982b; Piliavin et al. 1986). Among these studies, Paternoster and Saltzman (1982b) found that juveniles who have had experiences in the juvenile justice system had lower perceptions of sanction risk on their future delinquent activities. Similar findings were found by Minor and Harry (1982) and Horney and Marshall (1992), indicating that individuals who have had experiences with law violation had lower estimates of the risk of punishment than those with no such experiences. On the other hand, other perceptual deterrence studies, such as those by Burkett and Hickman (1982) and Thomas and Bishop (1984), found no significant changes in the perceptions of certainty among juveniles who had been sanctioned, compared to those who had not. They found that juveniles who had been sanctioned did not display an "experiential effect" as reflected in their perceptions of sanction risk. The issue of an experiential effect is one of the main reasons to carefully consider the temporal ordering between perceptions of sanction certainty and criminal behavior in doing perceptual deterrence research. This study considers this important time dimension in the subsequent analysis.

Another problem with previous perceptual deterrence studies was the limited generalizability of the samples used. Prior studies examining perceptual deterrence have had as their sample college students or delinquents involved in minor infractions (Klepper and Nagin 1989; Ward and Tittle 1993). Piliavin et al. (1986) noted that previous studies have analyzed "restricted populations of conventional persons and nonserious crimes" and ignored "serious offenders . . . the crimes and criminals our public fears most" (1986). On the same note, Klepper and Nagin (1989) cautioned that researchers who have used conventional persons in their samples may be asking these respondents questions about criminal activities that may be outside their "scheme of conscious calculations." That is, the respondents may have never contemplated the act about which a risk question is asked, thereby making their assessments of risk untenable. This would raise serious concerns about validity.

The Study

This paper examines the effect of perceived punishment certainty on the success (completion) or failure of offenders in an intensive drug probation program. The "failure" of offenders in this program is deemed similar to the commission of a criminal act in that this "failure" (through drug or alcohol use while in the program, or absconding) is punishable by incarceration and should therefore induce on the part of offenders the same utilitarian assessments of costs and benefits as other criminal acts. In other words, the same principle of assessing the costs and benefits of committing crimes proposed by deterrence theorists should apply to the assessments of the costs (punishment) and benefits (temporary high, freedom) of "failing" (using drugs, alcohol, absconding).

This study is an improvement over previous studies of perceptual deterrence in that it addresses some of the methodological shortcomings found in those earlier studies. First, the information available concerns individuals' perceptions of sanctions on a micro-level. Key perceptual variables are available for examination in terms of possible deterrent effects. A second improvement with the current study is with regard to temporal ordering. The certainty measure used in this study was a question asked when offenders first entered the Intensive Supervision Program, about the risk of getting caught for a violation (drug or alcohol use, absconding). The measure therefore was collected *prior* to the offenders completing or failing the program. Third, the sample is comprised of individuals who were already in the criminal justice system, where punishment was imminent and not merely a vague "theoretical" possibility. It is also comprised of persons committing serious crimes. Both of these elements have seldom been found in previous perceptual deterrence studies (Piliavin et al. 1986).

Besides providing a test of deterrence, this study also provides important policy information by assessing the predictors of "successes" or "failures" in Intensive Probation Programs. Intensive drug probation programs are among a host of alternatives-to-prison sanctions (often referred to as intermediate sanctions) that have proliferated over the last few years in response to prison overcrowding (Pearson 1991; Pearson 1988; Petersilia and Turner 1993; Ryan 1997). These sanctions were designed to mete out punishments that were tough yet had "rehabilitative" elements, in hopes of giving offenders chances for reform. As an intermediate punishment, Intensive Supervision Programs (ISP) are characterized by more strict and intensified supervision of offenders in the community compared to ordinary probation and stiffer penalties for probation violations (Clear, Clear, and Braga 1993; Pearson 1988). Intensive Supervision Programs attempt to alleviate problems associated with prison overcrowding while at the same time satisfy a demand for punishments that are more harsh than traditional probation.

Evaluations of ISPs are meager, and many are still underway, but data on completed studies have asserted higher revocation rates for offenders in ISP programs compared to those in ordinary probation (Byrne 1990; Petersilia, Turner, and Deschenes 1992a). This often means higher returns to prison because of the stiffer penalties attached to ISPs (Clear et al. 1993; Petersilia and Turner 1990). Despite these high rates of revocation and the potential for more incarceration, few studies have examined predictors of "successes" and "failures" in ISP (Clear and Hardyman 1993). Researchers who have examined ISP outcomes have generally focused on "static" measures like demographics, criminal records, and some programming measures, but glossed over the offenders' attitudes about ISP, especially their perceptions of the certainty of punishment if they fail the program. Because ISP is characterized by stiffer penalties for violations, it is only logical to test how individuals subjected to these potential penalties perceive the penalties and what their behaviors are given these perceptions (Petersilia and Turner 1990).

Sample and Measures

Sample

This analysis uses data collected by the Institute for Criminological Research at Rutgers University on all individuals who entered New Jersey's Intensive Drug Probation program between January 1989 and April 30, 1990 (Pearson 1991). The total number of individuals who entered the program was 546, of which 516 were interviewed. The respondents were typical of offenders serving their first prison term in the late 1980s and early 1990s (Pearson 1991), most were convicted of drug crimes (62.5% for drug sales) or property offenses (29.7%), and most were in their early to mid-twenties.

The goal of the original research was to predict a drug use relapse in Intensive Supervision Probation (hereafter, ISP). Several measures relevant to relapse were gathered, including the attitudes of offenders toward ISP, their attitudes toward self, perceived certainty of punishments, criminal history, drug use, and alcohol use (Pearson 1991). Baseline measures were gathered, as well as post-failure or post-success measures. The original study found that the objective measure of punishment significantly predicted drug use while in the program and that subjective assessments of the certainty of punishment (specifically a question on the perceived number of positive urine tests before revocation) inversely predicted a drug-use relapse. These findings, however, used generally bivariate statistical techniques, and the outcome measure examined was limited to drug use.

This present analysis includes all types of "failures." This includes drug use, alcohol use, and absconding. Likewise, the analysis examines several factors that have been identified as correlates of criminal activities and program failures. Only baseline interviews are used as this ensures a sequential time-order between the characteristics and attitudes of offenders before treatment and their outcomes.

Independent Measures

Of primary concern in the original study was the effect of the "perceived certainty" of sanctions on the likelihood of successes (completions) or failures (revocations) among offenders who were court-ordered into an intensive drugdiversion program. Many questions that were asked of offenders concerned their perceptions of the certainty of getting caught if they violated program regulations. (Refer to Table 1 for a listing of the dependent and the independent measures.) Two of these measures are included in this paper because they had the lowest numbers of missing data and because these measures were highly correlated with the other perceptions of certainty measures. The first measure is the offenders' estimation of the number of times they can have a positive urine test (positive for illicit substances) before they are revoked. Answers here ranged from 0 "not sure" to 3 "3 or more times." The second perceived certainty measure is the offenders' estimation of the probability that a "street smart" person is detected for using drugs while in the program. This measure vicariously estimated the offenders' perceptions of the risk of detection through a hypothetical "street smart" individual. This measure was used because there was no question in the original database that directly asked the offenders the probability of their own detection (Pearson 1991). This measure also correlated highly with other certainty questions, such as whether an "average" person will get caught and whether an "average" person or a "street smart" person will get revoked. The range of answers for this measure was 0 for "no chance" through "100 percent certainty" of getting caught. For the purposes of the bivariate analysis, this variable was recoded and categorized as low (0-49% chance), medium (50-69% chance), and high (70-100%) probabilities of being caught, although the interval-level measure was used in the multivariate models.

Also included in the analysis are the offenders' feelings about two specific requirements of the intensive drug-diversion program: the curfew requirement and the community service requirement. The range of options for these variables was 0 for "hate it" through 100 for "love it." Again, for the purposes of the bivariate analyses, these measures were recoded to represent three categories: "hate it" (0–49%), "in the middle" (50–69%), and "love it" (70–100%), but the interval-level measure was used in the multivariate models.

Besides the offenders' perceptions of the certainty of sanctions and their attitudes toward the program, other domains of information that are included as independent measures are the offenders' history of drug use (marijuana, cocaine, crack and heroin), the percent of their friends using drugs, their criminal history, and demographic information. Regarding drug use, the offenders were asked if they have used marijuana, cocaine, crack or heroin in the year prior to entering the program. These questions were coded 0 for "no" and 1 for "yes." The

	Total	Failure (0)	Success (1)	Chi Sq.
Total Sample	100% (455)	50.1% (228)	49.9% (227)	
Race/Ethnicity				31.5***
Hispanic	17.0% (77)	41.6% (32)	58.4% (45)	
White	47.4% (215)	40.0% (86)	60.0% (129)	
Black	35.7% (162)	67.9% (110)	32.1% (52)	
Sex	()	()	· · · ·	0.742
Male (0)	87.3% (397)	50.9% (202)	49.1% (195)	
Female (1)	12.7% (58)	44.8% (26)	55.2% (32)	
Age				40.2***
1822	22.2% (101)	71.3% (72)	28.7% (29)	
2325	22.0% (100)	47.0% (47)	53.0% (53)	
26-30	22.4% (102)	55.9% (57)	44.1% (45)	
3135	14.3% (65)	44.6% (29)	55.4% (36)	
Above 35	19.1% (87)	26.4% (23)	73.6% (64)	
Number of Positive to Revoke		× ,		0.92
0	21.9% (93)	52.7% (49)	47.3% (44)	
1	25.9% (110)	50.0% (55)	50.0% (55)	
2	32.9% (140)	47.1% (66)	52.9% (74)	
3 or more	19.3% (82)	52.4% (43)	47.6% (39)	
Prob. Street Smart Caught				9.78**
Low	8.9% (38)	73.7% (28)	26.3% (10)	
Medium	16.6% (71)	49.3% (35)	50.7% (36)	
High	74.5% (318)	46.9% (149)	53.1% (169)	
Feel about Curfew				5.6
Hate It	26.7% (115)	58.3% (67)	41.7% (48)	
Middle	41.5% (179)	44.1% (79)	55.9% (100)	
Love It	31.8% (137)	50.4% (69)	49.6% (68)	
Feel about Comm. Svc.				0.284
Hate It	25.1% (108)	51.9% (56)	48.1% (52)	
Middle	42.1% (181)	48.6% (88)	51.4% (93)	
Love It	32.8% (141)	49.6% (70)	50.4% (71)	
Percent of Friends Use Drugs				5.3
None	48.1% (201)	46.3% (93)	53.7% (108)	
< Half	26.1% (109)	46.8% (51)	53.2% (58)	
Half to All	25.8% (108)	59.3% (64)	40.7% (44)	
Marij. before ISP				1.6
No (0)	57.3% (247)	47.4% (117)	52.6% (130)	
Yes (1)	42.7% (184)	53.3% (98)	46.7% (86)	
Cocaine before ISP				1.9
No (0)	47.3% (204)	46.6% (95)	53.4% (109)	
Yes (1)	52.7% (227)	52.9% (120)	47.1% (107)	

Table 1 Independent Variables and Results of Bivariate Analysis

(continued)

	Total	Failure (0)	Success (1)	Chi Sq.
Crack before ISP				9.8**
No (0)	87.7% (378)	47.1% (178)	52.9% (200)	
Yes (1)	12.3% (53)	69.8% (37)	30.2% (16)	
Heroin before ISP				16.1***
No (0)	84.2% (363)	45.7% (166)	54.3% (197)	
Yes (1)	15.8% (68)	72.1% (49)	27.9% (19)	
Juvenile Convictions				10.54**
No (0)	84.2% (354)	46.0% (163)	54.0% (191)	
Yes (1)	15.8% (101)	64.4% (65)	35.6% (36)	
Indictable Convictions				4.05*
No (0)	63.7% (290)	46.6% (135)	53.4% (155)	
Yes (1)	36.3% (165)	56.4% (93)	43.6% (72)	

Table 1 (continued)

offenders were also asked to estimate the percentages of their friends outside of prison who regularly used drugs. This measure is used in the paper to represent the level of the offenders' social networks who use drugs to examine any impact this may have on the offenders' outcomes in the program. Criminal history is represented by two measures, the number of the offenders' juvenile convictions and the number of indictable convictions. Demographic measures included age, race and sex. These three variables have been shown in several other studies as significant correlates of illicit activities (Sampson and Laub 1993; Steffensmeier and Streifel 1991), as well as predictors of outcomes in some treatment modalities (Smith and Silverman 1994). Thus, these measures are examined in the bivariate and the multivariate models.*

Dependent Measure

The dependent measure used is the offender's status at the end of the program. This took two forms for each of the multivariate analyses conducted. For the Logistic Regression model, status at the end of the program was dichotomized into "failures" (0) and "successes" (1). "Successes" includes offenders who completed the program or maxed-out of the program. "Failures" includes offenders who were revoked to prison, were in jail awaiting revocation hearing, or those who absconded from the program. Offenders who were still in the program at the completion of the study (n = 87) were not included in the Logistic Regression analysis (since they neither succeeded nor failed) but were included in the Cox Regression model. The total number of cases for the Logistic model was 455. The dependent variable for the Cox Regression model was the number of days offenders had stayed in treatment. This included all the offenders referred to treatment, i.e., those who completed, failed, and those who were still in treatment at the end of the study.

Two multivariate models are used in the succeeding analyses. First, the Logistic Regression model is used to predict the characteristics of offenders "most likely" to complete the program, and examines the effects of the measures of perceived certainty on outcome status while holding all the other independent variables constant. However, because this technique can only handle a dichotomous dependent measure, offenders who were still in the program at the time of the study's completion are excluded from the analysis. The Cox Regression model is then used to examine the predictors of the number of days offenders stayed in treatment. Cox regression is part of a host of survival models that is used with censored observations; these are observations for which the event of interest (failure) has not yet occurred. Therefore, cases where neither a "success" nor a "failure" is observed, are included in this analysis. In the Cox models, the risk (proportional hazards) of failure for each offender's discrete time in the program is estimated using the baseline probability of their dropping out of the program at specific time intervals. Cox regression predicts this "risk" as a function of a set of independent measures.

Results

Bivariate Model

Table 1 outlines the bivariate results between the independent measures and the dichotomous dependent measure, the outcome status. Of outcome status, 49.9% (227) of offenders successfully completed the program while 50.1% (228) did not, and had either been revoked or were pending revocation at the completion of the study's observation period. The table also shows that among the demographic measures, race and age were statistically related to the program outcome. Of race, White and Hispanic participants had significantly higher success rates than African American participants (60% and 58% respectively, vs. 32%). Of age, older participants had higher success rates.

As to certainty measures, a significant association was found between one of the measures (the participants' opinions of a "street smart" person getting caught), and success rates. A significant proportion of offenders who thought a "street smart" person would have a low probability of getting caught, failed (74%), compared to those who thought there was a medium or high probability of getting caught. As to the offenders' attitudes about specific program requirements, none had any bivariate relationships with the offenders' outcome status.

Some of the drug use measures, however, were significantly related to the offenders' success or failure in the program, specifically crack use and heroin use

the year before program initiation. Offenders who used crack prior to program initiation had failure rates of up to 70% compared to about 47% of those who did not use crack. Likewise, offenders who used heroin the year before program initiation had failure rates of approximately 72% compared to 43% among those who did not. Another measure, the percentage of a participant's friends who used drugs had proportions in the expected direction and almost significant at p = .05. Here, participants who claimed to have no friends who used drugs had the lowest proportions of failures (46%); those who claimed to have 50% or more friends who used drugs had the highest proportions of failures (59%).

Finally, for both measures of criminal history, the numbers of prior juvenile convictions and the numbers of prior indictable convictions were significantly related to program outcomes. Sixty-four percent of those who have had a juvenile conviction failed in the program compared to 46% of those who didn't. Also, 56% of those who have had an indictable conviction failed compared to 47% of those who never had an indictable conviction

Multivariate Models

Logistic Regression. Logistic regression is used to examine the characteristics of offenders who are likely to succeed or complete the program. To examine the incremental effects of the independent measures, the logistic model first included only the demographic measures, then program perception measures were added, then the perceptions of certainty measures, friends using drugs, drug use measures, and finally, criminal history. Table 2 presents the final model, which includes all the independent measures. This model correctly classifies 71% of "failures" and 70% of "successes," which is better than the baseline distribution.

In the logistic regression, two demographic variables, race and age are significant. These variables were significant when initially entered into the logistic model, and remained significant even after controlling for additional measures. The effects of these measures are similar to the direction observed in the bivariate model with Whites and Hispanics significantly more likely than African-Americans to complete the program, and older offenders significantly more likely to succeed. Three other measures appeared to significantly predict outcome status: one measure of the offenders' perceptions of certainty (a "street smart" individual getting caught), the offenders' crack use prior to program initiation, and the offenders' heroin use prior to program initiation. As observed in the bivariate models, the offender's vicarious estimation of detection (of a hypothetical "street smart" individual) was significantly related to outcome status, even after controlling for other measures. The more offenders believed that a "street smart" person would get caught violating the rules of the program, the more they themselves were likely to succeed in the program. This points directly to the relevance of their estimation of the certainty of detection on their perfor-

		В	S.E.	Exp (B)
Race/Ethnicity				
Race 1 (Hispanic)		1.43	0.35	4.18***
Race 2 (White)		1.37	0.26	3.93***
Sex		0.27	0.36	1.31
Age		0.08	0.02	1.09***
Number Positive Urines to Revoke		0.17	0.11	1.18
Prob. Street Smart Person Revoked		0.01	0.00	1.11*
How Feel about Curfew		0.01	0.01	1.00
How Feel about Comm. Svc.		-0.01	0.01	0.99
Percent Friends Using Drugs		-0.01	0.00	0.99
Juvenile Convictions		-0.44	0.29	0.64
Indictable Convictions		-0.41	0.25	0.67
Use Marijuana before ISP		0.08	0.25	1.09
Use Cocaine before ISP		0.31	0.25	1.37
Use Crack before ISP		-0.79	0.36	0.45*
Use Heroin before ISP		-3.92	0.81	0.29***
-2 Log Likelihood	454.15			
Model Chi-Square	108.7***			

 Table 2

 Full Model of the Predictors of ISP Outcome

mance in the program. Offenders who perceived that detection was imminent (even for a "street smart" individual), were likely to complete the program. Among other significant measures, use of crack or heroin before program initiation is a significant predictor of outcomes, even when other variables are controlled. However, with regard to criminal history, it appears that the initial bivariate relationships observed are spurious and the initial relationships observed are accounted for by the other measures included in this model. Table 3 presents a reduced model, which includes only significant measures shown above, and two other measures that were near significant. As shown, the same variables significant in the full model remained significant in this reduced model.

Cox Regression. The logistic models above inform us of the characteristics of offenders who are likely to succeed or fail the intensive diversion program. However, the previous analysis only allowed a dichotomous dependent variable,

	В	S.E.	Exp (B)
Race/Ethnicity			
Hispanic	1.4	0.4	4.23***
White	1.3	0.3	3.57***
Black (Comparison Category)			
Age	0.1	0.0	1.08***
Number of Positive Urines to Revoke	0.2	0.1	1.16
Prob. Street Smart Person Revoked	0.0	0.0	1.10*
Percent of Friends Using Drugs	-0.0	0.0	1.00
Use Crack before ISP	-0.7	0.4	0.52
Use Heroin before ISP	-1.2	0.3	0.29***
-2 Log Likelihood 4,654.7			
Model Chi-Square 97.02***			

 Table 3

 Reduced Model of the Predictors of ISP Outcome

making it unfeasible to predict the likelihood of success or failure among those offenders who were still in the program at the time the study ended. Cox regression models address this problem. As a survival technique, Cox models allow for the prediction of a dependent variable (here, length of time to failure/dropping-out) given *censored* observations.

Results are presented in Table 4. As shown, the same variables that were significant in the Logistic models are significant here, reinforcing the initial findings. Because this model predicts time to failure, a negative beta coefficient (B) indicates that the variable "slows down" time to the event (failure), and a positive coefficient means faster time to failure (increased hazards). The same directions that were observed in the Logistic models were also observed here. Whites and Hispanics, compared to African Americans had slower times-to-failure, older offenders had slower times-to-failure, and the same is true of offenders who perceived that "street smart" offenders would get caught. Variables that appeared to accelerate the offenders' times-to-failure were crack and heroin use before treatment initiation as well as greater percentages of friends using drugs. The latter is the only measure that is significant in this model that was not significant in the logistic models. Therefore, although the effect of this measure was not large enough to predict outcome status, friendships with individuals who used drugs appeared to pose a significant "risk" of accelerated failure.

	В	S.E.	Exp (B)
Race/Ethnicity			
Hispanic	-0.79	0.23	0.45***
White	-0.67	0.16	0.51***
Black (Comparison Category)			
Sex	-0.28	0.23	0.75
Age	-0.04	0.01	0.96**
Number of Positive Urines to Revoke	-0.10	0.07	0.90
Prob. Street Smart Person Revoked	-0.01	0.03	0.88*
How Feel about Curfew	-0.01	0.00	1.00
How Feel about Comm. Svc.	0.00	0.00	1.00
Percent Friends Using Drugs	0.01	0.00	1.01*
Use Marijuana before ISP	-0.07	0.16	0.93
Use Cocaine before ISP	-0.06	0.15	0.94
Use Crack before ISP	0.51	0.19	1.67**
Use Heroin before ISP	0.59	0.18	1.81**
Juvenile Convictions	0.33	0.17	1.40
Indictable Convictions	0.20	0.15	1.22
-2 Log Likelihood 2,138.5			
Model Chi-Square 105.62***			

 Table 4

 Cox Regression Model of Time to ISP Failure

Discussion

Deterrence researchers have recently begun to recognize the importance of the offenders' perceptions of punishment certainty on their assessments of the risks and benefits of criminal activities. However, tests of deterrence theory, particularly those that examine the offenders' perceptions of the risks of sanctions, are still limited in at least two ways: first in establishing the time-order between perceptions of the certainty of punishments and criminal behaviors; and second, in using samples that were not generalizable to the offending population.

This paper addressed these two issues by examining the effects of perceived sanction certainty on the outcome status of individuals who were mandated to complete an intensive drug diversion program. The time-order issue was addressed by taking the offenders' responses to perceived certainty of sanctions as soon as they initiated the program and therefore *before* any of their subsequent outcome statuses. The sampling issue was addressed by examining behaviors of individuals who were already under criminal justice custody and have committed serious crimes. Threats of sanctions were therefore imminent and not merely a "theoretical" possibility.

The "criminal behavior" studied was the offenders' failure to comply with program requirements, thereby risking revocation and re-incarceration. As stated in the beginning of this paper, although the failure to comply with program requirements is not substantively "criminal," it solicits the same types of formal sanctions as criminal behaviors, if not more so given the stiff penalties often attached to violations of court-ordered programs (Clear Todd and Hardyman 1993; Petersilia and Turner 1990). Thus, the same logic that is applied to the offenders' calculations of the risks and benefits of criminal behaviors also applies to the calculations of the risks and benefits for violating court-mandated programs.

The results shown in the logistic and the Cox regression models provide support for the positive effect of the offenders' perceptions of the certainty of sanctions on their outcome status and their lengths of time in the program. Controlling for measures that previously have been found to correlate with criminal behaviors and program attrition, the offenders' perceptions that a "street smart" individual will get caught if this individual violates the requirements of the program remains a significant predictor of program completion by the offender. This finding has implications for policy. Attempts by policymakers to reduce "failures" in alternatives-to-prison programs may be efficiently addressed by increasing the offenders' perceptions of sanction certainty. However, more studies are needed to carefully examine how offenders' perceptions of sanction threats are affected by law, criminal justice policy, and other social processes. This study is only a start of several more studies that need to be completed to better assess the role of perceived sanction certainty on offenders' avoidance of criminal behaviors or compliance with criminal justice-based programming and rehabilitation.

Besides perceptions of the certainty of sanctions, the demographic measures of race and age were also found to be significant predictors of outcome status. The significance of race may perhaps be due to variables not controlled for in this model, such as human capital or family stability, that were previously found to correlate with race and ethnicity (Fagan 1993). However, these measures were not available in this study. Specific interactions were nevertheless considered in the logistic and the Cox regression models to see if the effects of ethnicity were clarified. The authors examined the interactions between ethnicity and friends using drugs, as well as ethnicity and criminal history, but these interactions were far from significant and did not contribute to the explanatory powers of the models. Besides ethnicity, age and use of crack or heroin were also significant predictors of outcome status. The age effect was in the expected direction: older offenders were less likely to "fail." This trend reinforces the existing empirical and theoretical knowledge about this element, which has often been shown to negatively correlate with criminal behaviors and program attrition. Nevertheless, it poses a compelling issue, that younger offenders need more interventions to keep them in the programs than older offenders, given their propensity for failures. Similarly, the effects of the use of crack or heroin on the outcome status of offenders call for some intervening measures for offenders who have had histories of crack and heroin abuse, as these attributes were also significant predictors of noncompletion and accelerated failure.

ENDNOTE

*Tolerance statistics and Pearson's correlations were performed to check for multicollinearity across the independent measures. No multicollinearity was observed. Tolerance levels ranged from .78 to .94 which are acceptable levels, and correlation coefficients ranged from .013 to .399.

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