Prison Education Program Participation and Recidivism: A Test of the Normalization Hypothesis

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Abstract

I argue that prison education programs are representative of a larger number of what I call normalizing prison programs and operations found in many contemporary prisons that serve to increase prison safety and decrease recidivism. Normalizing programs and operations achieve these goals, I argue, by reducing prisonization and by nurturing prosocial norms. Using data for a cohort of Federal prison releasees, I test the hypothesis that inmates who actively participate in education programs have lower likelihoods of recidivating, defined as a rearrest or parole revocation within 3 years after release, controlling for several background and post-release measures, including post-release employment. Results show that inmates who actively participate in education programs have significantly lower likelihoods of recidivating. Because this effect is independent of post-release employment, I argue that results support the normalization concept.

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Introduction

This study argues that prison education programs are representative of a larger number of "normalizing" prison programs serving to increase prison safety and to decrease recidivism. Normalizing programs and operations achieve these goals, I argue, first, by reducing prisonization and, second, by nurturing prosocial norms supporting rule/law abiding behavior. [1]

Gresham Sykes (1958) identified five pains of imprisonment: isolation from the larger community; lack of material possessions; blocked access to heterosexual relationships; reduced personal autonomy; and reduced personal security. Sykes argued that these deprivations foster what is currently referred to as prisonization, that is, alienation from the prison staff and management, and from the larger society. Additionally, criminologists argue that many inmates bring to prison a commitment to criminal subcultures and criminal norms (Irwin and Cressey 1962). Both the deprivations of imprisonment and the imported criminogenic norms, criminologists argue, facilitate the growth of inmate subcultures favoring a normative orientation hostile to prison management and supporting a continuation of criminal behavior after release from prison (Thomas and Petersen 1977; Kassebaum et al. 1971; Thomas and Foster 1972; Thomas and Poole 1975). [2]

While prisons, given their statutory mandate, cannot directly eliminate the pains of imprisonment, either by freeing inmates or by making life in prison nearly identical to life in the larger community, prisons can be organized in ways that simultaneously mitigate these pains and offer inmates seeking relief opportunities to find it in ways that promote their adoption of prosocial norms. This is done in many prisons today, by breaking down the barriers between staff and inmates, providing rolemodels of prosocial behavior, and by importing, when possible, institutional programs such as

schooling and work, which in the community, serve partly to socialize/normalize toward prosocial norms and behavior.

In practice, these normalizing programs and operations can take many forms, including emphasis on staff use of a human relations approach when working with inmates; a unit management style of prison operation; prison industries and other work programs; female correctional officers in male institutions; social furlough programs; use of effective classification techniques; a formal policy guaranteeing inmates' due process rights when charged and adjudicated for rule violations; guidelines for sanctioning misconduct that eliminates disparity; and education programs, to mention only some of what I see as normalizing policies, programs, and operations found in many modern prisons. All of these programs facilitate humane treatment of inmates, open lines of communication between staff and inmates, and provide opportunities for diversion from the pains of imprisonment in ways that legitimate and reinforce law-abiding norms. My perspective is similar to that of Robert Johonson (1987) who argues for prison operations that provide inmates with encouragement and opportunities to find "niches," as he calls them, in which inmates can "maturely cope" with the "pains of imprisonment." Johnson claims that inmates who learn "mature coping" in prison will also cope more maturely with life in the community after release and, therefore, will be less likely to recidivate.

Movement Toward Normalization in American Prisons

After evaluations of rehabilitation programs rooted in a psycho-pathology model of criminal behavior and experimented with in the 1970's showed little, if any, treatment effect, American correctional treatment philosophy turned pragmatic. Policy emphasis shifted from a medical model of rehabilitation to strategies for managing safe and humane prisons in which inmates are provided opportunities and encouragement to strengthen their

social bonds (i.e., normalization) through programs emphasizing work, education, substance abuse treatment, strengthened family and community ties, and wellness. By design, this new policy emphasizes individual responsibility and targets prison conditions and inmate needs that from professional judgment and sound empirical research, have been identified to contribute to positive prison adjustment and to a productive non-criminal, life after release from prison.

Within this new normalization paradigm, progressive efforts, in many American prisons, have turned to improving the quality of program delivery, and experimentation with operational and programmatic modifications directed toward increasing inmate adjustment within safe and humane prisons, while simultaneously reducing the recidivism rate. Examples of recent efforts to improve management quality, within the Federal Bureau of Prisons, are the adoption of strategic planning and improved management information systems. An example of a recent programmatic experiment is the development of the discipline hearing program, which created a group of specially trained and independent discipline hearing officers who adjudicate serious inmate misconduct.

As indicated, prison education programs are one critically important component in this new normalization paradigm. Prison education program participation normalizes by offering relief from the pains of imprisonment and by helping inmates to appreciate and adopt prosocial norms. Since at least as far back as the time of Aristotle, philosophers and scholars of education have argued that education creates the socially good (i.e., moral) person (Aristotle; Durkheim 1911). These scholars view the educated person as having both the knowledge and reasoning ability synonymous with the truly free and moral human being. Uneducated, unsocialized/contrasocialized persons, incapable of informed moral reflection, are the truly imprisoned.

A Test of the Normalizing Effects of Education Programs

Since disproportionate numbers of prisoners have both low educational attainment and poor work histories, it is not surprising that prison administrators justify education programs on the grounds that such programs contribute to the employment prospects of inmates and will thus reduce recidivism rates. While this linkage between education and employment is hypothesized as reducing recidivism, I do not test this hypothesis here. Instead, I aim to test the normalizing effects of prison education program participation. That is, does the normalizing experience of prison education programs reduce recidivism? Education programs serve to occupy the inmate's time productively, thus limiting the negative influence of prisonization, and further serve to socialize/resocialize inmates toward acceptance of prosocial norms. In order to isolate the normalizing effects of participation in prison education programs from those of increased employment prospects, I control for post-release employment when testing the effect of education program participation on recidivism.

Methods

Although Federal prison inmates without a high school or General Educational Development (GED) diploma are required to take at least one literacy course, and all other inmates are encouraged to participate in educational programs, and various incentives exist to promote participation, both participation and successful completion remains largely voluntary.[3] The researcher cannot randomly assign inmates to successfully complete educational programs for experimental purposes; rather, inmates self-select themselves into and through programs. Therefore, the researcher must rely on statistical techniques to isolate the recidivism-reducing effect, if any, of prison education program participation. The primary concern is, guided by theory and past research, to identify empirical measures of the self-selection process

that can be used as statistical controls when evaluating program impact.

The research literature suggests several statistical methods for handling selection bias (see Berk 1987). I report results for two of these methods here. First, I use multivariate models to predict recidivism in which a measure of program participation is included along with all variables thought to predict program participation and recidivism. I refer to this approach as the full multivariate approach. Second, I separately estimate propensity scores predicting likelihood of not participating in education programs. I then use these propensity scores to control for selection bias, in place of the separate variables predicting program participation used in the full multivariate approach. I refer to this as the propensity score approach.

With the multivariate approach, the intention is to identify and measure all the individual and environmental factors thought to influence both program participation and recidivism, and control for these measures in a regression model when assessing program effects.

The propensity score approach (Berk and Newton 1985; Rosenbaum and Rubin 1984) involves modeling the selection process with a set of measures predicting program participation to arrive at a single measure called a propensity score that is then used to control for selection bias. Ideally, researchers use theory and prior research to select measures thought to predict program participation. However, the ideal is seldom realized, and the researcher usually selects variables predicting program participation by using available measures in a stepwise regression. The predicted, or conditional, probabilities, the propensity scores, are used to control for the self-selection process in further regressions predicting outcome (Rosenbaum and Rubin 1984). Several advantages of the propensity score approach over direct multivariate control are described by Berk and Newton (1984). One advantage Berk and Newton cite is that measures found useful in modeling selection bias provide insight into the selection process. I would add that these insights

may guide the development of theories and measures allowing improved ability to model and subsequently control for the selection process in future evaluation research on similar programs. Additionally, an understanding of the selection process may also help correctional and education program personnel to develop operations and policies for attracting more inmates to become involved in prison education programs.[4]

Data and Variables

The data used in this analysis are from a 35-percent random sample (N = 1,205) of all inmates who were released, between January 1 and June 30, 1987, directly from Federal prison or through halfway houses to the community in the United States and who had received prison sentences greater than 3 months. My analysis is conducted on a subsample (N=619) of this group and contains only persons having a prison stay of more than 1 year. This was done because those in prison for less than a year may have had insufficient opportunity to participate meaningfully in education programs.

Table 1 provides the variable names and definitions. The outcome measure is labeled RECID and is a dummy variable coded "1" if the person recidivated (i.e., was rearrested or had parole revoked during the 3-year followup period) and "0" otherwise. The program measure is labeled EDUCPRG and is a dummy variable coded "1" if the person successfully completed at least one-half (.5) of an education course per 6 months of the prison term and "0" otherwise. This measure was chosen for two reasons: first, it provides a measure of treatment dosage, something that is often missing from evaluation studies and, second, the bivariate association between education program participation and recidivism suggests that .5 courses per 6 months of the prison term was a tipping point for reduced recidivism rates. I control for employment at release with the variable labeled RELEMP, coded "1" if the person was employed at release from prison and "0" otherwise. The remaining variables listed in Table 1 were examined in developing the final model. The variables were chosen from research on individual and structural predictors of criminal behavior, recidivism, and community crime rates (Schmidt and Witte 1988; Farrington, Sampson, and Wikström 1993). To arrive at the specification of the regression models used in the analysis, I conducted an exhaustive analysis using all the predictor variables listed in Table 1, in various combinations, including interactions.

Table 2 provides variable means and standard deviations for the full sample and subsample for those variables used in the analysis.

Mode of Analysis

I begin the analysis using the full multivariate method in which discrete time hazard rates of recidivating, in six semiannual periods following release, are simultaneously regressed (logistic regression) on the program measure and all control variables (see Allison 1984, pp 16-22). I also examine accelerated failure time models predicting the log of time to recidivism in months, assuming an exponential distribution for failure times. I conclude with the propensity score analysis.

The logistic models were each subjected to a number of diagnostic tests (see Hosmer and Lemeshow 1989, pp. 149-170). I discovered no problems that would invalidate the findings reported.

In what follows, I first present, for the interested reader, results from analyzing recidivism predictors for the entire sample of 1987 releasees. I then move on to the main topic of the paper, testing the normalizing effects of educational program participation among inmates spending a year or more in prison.

A Preliminary: Recidivism Predictors for the entire 1987 Release Sample.

Before proceeding to analysis limited to releasees spending a year or longer in prison, it will be informative, especially for those wishing to formulate appropriate normalizing prison policies, operations, and programs, to examine recidivism predictors for the entire sample of 1987 releasees. Table 3 presents results for a discrete time hazard model. I arrived at the model's specification guided by past research and theory on recidivism and after exhaustive analysis using all the variables listed in Table 1 in various combinations, including interactions.

Results shown in Table 3 reveal that the following variables significantly (at the .05 level or less) increase the risk of recidivating: number of prior convictions; heroin abuse; alcohol abuse; and having been under some type of criminal justice system supervision at the time the current offense was committed. Variables significantly related to a lower risk of recidivating are a high Salient Factor Score (the Salient Factor Score is heavily weighted with prior convictions and is designed to be inversely related to recidivism risk); stable employment prior to prison; receiving a social furlough while in prison; employment at release; age (the older the releasee, the lower the risk); living with a spouse after release; and, nearly significant at the .05 level, prison education program participation. While the variable measuring education program participation is not significant at the .05 level, it is nearly significant at that level, with a p value of .0637 in model 1 and .0766 in model 2. This may be due to the extremely short prison stay for many of the inmates in the full sample. Shorter term inmates who participated in education programs may simply not have had sufficient exposure to have benefited from that participation.

These measures suggest normalizing prison policies, operations, and programs and inmate actions that could reduce prisonization and increase post-release success. For example, the link between prior record and recidivism indicates a possible link between prior record and prison misconduct (the correlation between both prior convictions and the Salient Factor Score with prison misconduct are 0.24 and -.26 respectively, with both significant at the .05 level) suggesting, therefore, the need for placement into an institution with both more intensive custody practices and more intensive programming. The effect of prison education program participation suggests the need for well managed prison education programs and for efforts to increase inmate participation in them. Heroin and alcohol abuse need to be addressed with well managed drug treatment programs designed along the lines of programs

shown to be effective in reducing substance abuse. Well managed programs that improve work skills, work habits, and job search skills are needed for all inmates. Policies and programs promoting family stability and community contact such as parenting classes, visitations, social furloughs, and locating inmates close to their home residences should be maintained.

I now move on to a more complete analysis of the normalizing effects of education program participation.

Results

Table 4 provides some basic information about the relationship between education programs and recidivism, showing the three-way relation between education program participation, educational attainment at prison admission, and recidivism.

Looking first at the bottom row of Table 4, we see that 15.0 percent of the sample had an 8th grade education or less and an additional 27.9 percent had between an 8th and 12th grade education for a total of 42.9 percent without a high school degree. The Census Bureau reported that in 1987 only 14.0 percent of the population age 25 years or over had less than a high school education. If we take a high school degree as the basic educational attainment needed to function adequately in modern society, then we see that a much larger percentage of persons sentenced to Federal prison are in need of further education than persons in the community.

Also, in the bottom row, we see that except for a slight rise from those with less than an eighth grade education to those with some high school, the percent recidivating declines steadily from 54.9 percent recidivating among those with some high school to 7.7 percent among those with a college degree.

The last column of Table 4 displays the frequency of education program participation, measured by the number of courses successfully completed for each 6 months confined. Courses reflected here include Adult Basic Education

(ABE), General Educational Development (GED), Adult Continuing Education (ACE), Post Secondary Education (PSE) including college courses and vocational training, and social skills courses (e.g., parenting). [5] We see a definite decline in recidivism rates -- from 44.5 percent recidivating among those completing no courses during their prison term to 30.1 percent among those completing at least .5 courses during each 6 months of their prison term.

In the body of Table 4, we see that within every educational attainment category, except college graduate (of which there are only 13), that the greater the educational program participation, the lower the recidivism rate. The greatest decline in recidivism, with educational program participation, is among those who come to prison with a high school degree. Among high school graduates, the recidivism rate for those who took no courses was 39.2 percent compared to 24.5 percent among high school graduates who participated in at least .5 education courses each 6 months of their term, or a drop of 14.7 percentage points in the recidivism rate. However, even those who came to prison with an eighth grade education or less experienced a 7.9-percentage-point drop in their recidivism rate between those who took no courses and those who actively participated in education programs.

The question that needs to be answered is: Are these declines in recidivism due to the normalizing effects of participating in education programs? I must try to rule out two alternative explanations for this relationship: first, that it is due to the increased employment prospects that more education allows for and, second, that other characteristics of inmates explain both education program participation and lower recidivism. To accomplish this objective, I first use the full multivariate approach and then the propensity score approach.

I begin the full multivariate approach by estimating logistic regression models predicting discrete time hazard rates for the six semiannual periods making up the 3-year followup period, while controlling for all variables

thought to affect both educational program participation and recidivism, including post-release employment. Table 5 provides the coefficient estimates for two models. The models differ only in the criminal momentum measure used in each, the U.S. Parole Commission's Salient Factor Score SFSCORE (in Model 1) and the number of prior felony convictions NPRIOR (in Model 2). Separate models are estimated because of the very high correlation between the SFSCORE and NPRIOR. As we can see, in both models, EDUCPRG or educational program participation significantly (at the .01 level) reduces the hazard of recidivating.

I tested for the combined significance of the variables measuring time (PRD1-PRD5) and found they do not add significantly to the models, indicating a constant hazard rate. Therefore, I assumed an exponential distribution for hazard when estimating accelerated failure time for the variables used in Table 5, Models 1 and 2. Coefficient estimates for the two models are provided in Table 6. We see that education program participation significantly (at the .0001 level) increases the time until first recidivating event in both models.

To summarize, using the full multivariate approach to control for selection bias and predictors of recidivism including post-release employment, we find strong evidence that education programs reduce recidivism, possibly through normalization.

Estimating Propensity Scores Measuring Self-Selection Into and Through Prison Education Programs

To provide greater insight into the self-selection process, I then estimated propensity scores predicting who is not likely to participate in education programs, using these propensity scores to control for selection bias when evaluating the effect of program participation. I also estimated propensity scores that predict who participates, rather than non-participants.

As I expected, the variables selected (i.e., MALE, HEROINMS, LSCHYRS, HFWHOUSE, LAGEREL, MILDOTH) were the same as those predicting lack of participation; however, the coefficient signs were just the opposite from those reported below. The steps required to estimate propensity scores provide insight regarding the self-selection process.

I estimated propensity scores by conducting a stepwise logistic regression of all the variables in Table 1 excluding NPRIOR and PRD1-PRD5 on the educational program participation measure EDUCPRG. I required a .05 significance level for a variable to remain in the model. Table 7 presents the final model. We see that males are less likely to participate than females; persons for whom there is missing information on heroin dependency (N=60) are less likely to participate; persons with higher educational attainment at admission are more likely to participate; persons released through a halfway house were more likely to participate; older inmates were less likely to participate; and inmates who were in the military and discharged other than for honorable or dishonorable reasons (e.g., medical reasons) were more likely to participate.

The means, standard deviations, minimum and maximum values, and box plots for the propensity scores for those who participated in more than .5 courses semiannually during their term and for those who did not are presented separately in Table 8. The important item to note is that for almost all persons (actually 98.5 percent) taking .5 courses or more, there is a nearly matching propensity score among persons taking less than .5 courses during their prison term. Only at the low end of the propensity score distributions are propensity scores for non-participants truncated relative to the distribution for participants, with 2.5-percent of participants having scores below the lowest score for non-participants.

Using logistic regression, I regressed a measure of whether or not a person recidivated on the propensity scores separately for the participants

and non-participants. Figure 1 shows a plot of the predicted values from these logistic regressions (Y axis) by the propensity scores (X axis). The plot indicates that among participants, the slope for probabilities of recidivating is relatively flat, but for the non-participants, the likelihood of recidivating increases with the probability of not participating in educational courses. What this plot indicates is that even those persons least inclined to participate in education programs would be less likely to recidivate if they participated in at least one-half of a course per half-year during their prison term.

Tables 9 and 10 reproduce the analysis of Tables 5 and 6 respectively, with the variables used to estimate propensity scores replaced by the single propensity score variable PSCORE. Again, we see that education program participation significantly reduces the recidivism hazard rate (Table 9) and increases the time until recidivism (Table 10).

Estimated Cost Savings From Education Programs

To estimate potential cost savings from reduced recidivism due to education course participation, I first used a logistic regression model using all the variables for Model 2 in Table 6 to predict the log odds of recidivating in the 3-year followup period (results not shown). Then, with the coefficients from the regression, and by setting the control variables at their sample means, I estimated recidivism rates for the sample under the condition that no inmates took at least .5 education courses during each 6 months of the prison term and under a second condition that all inmates took courses at that rate or higher. Under the first condition (no participation), the estimated recidivism rate is 45.73 percent and under the second condition (total participation), the recidivism rate is 38.54 percent, reflecting a difference of 7.19 percentage points, or a 15.7-percent reduction in recidivism. With these estimates, we can get a crude estimate of the potential cost savings from prison education programs in Federal prison. Let us assume an annual release cohort of 5,000 inmates who served at least 1 year in prison. Then, with the recidivism rates from above, we can compute that if none of these inmates participated in at least .5 courses per 6 months served, the estimated number recidivating is 2,287. We can then compute that with all inmates participating in education programs at this rate or higher, the estimated number recidivating is 1,927, or a difference of 360 recidivists, again, a 15.7-percent reduction in recidivism. Now, assuming recidivists spend an average of 1 year in prison for their recidivating offense, and using a conservative estimate of $22,000 as the annual per inmate cost of incarceration, we see that the prison savings alone come to $7.9 million. This does not include costs to victims, law enforcement costs, court costs, welfare costs, and lost income taxes -- all of which would no doubt be substantial and bring the total savings somewhere well above $10 million. Additional cost savings would most likely accrue due to lower custody costs

for prisons providing education programs, due to reduced prisonization and associated reduced misconduct. However, sufficient data are not available here for directly testing the hypothesis that education programs reduce prisonization and, thereby, misconduct.[6] In sum, only focusing on the effects of educational program participation on recidivism, we see that potential dollar savings from prison educational programs could be quite large.

Conclusions

Results of this analysis provide substantial evidence that prison education program participation reduces the likelihood of recidivating irrespective of post-release employment. I interpret this result as support for the normalization hypothesis, which posits that many policies, operations, and programs found in modern prisons reduce prisonization and nurture prosocial norms supporting rule/law abiding behavior. Therefore, results reported here for the education program and recidivism relationship may be generalized as showing that other prison policies, operations, and programs (e.g., unit management, prison industries, furlough programs, female corrections officers, due process in handling misconduct) that have normalization as a goal may also reduce recidivism. Additional analysis suggests that the monetary savings from reduced recidivism, due to prison education program participation, are substantial.

Future Research

Clearly, additional research is needed not just to determine, in a very broad sense, whether education programs reduce recidivism, but also to consider the following:

1) Use of subjective measures of commitment to criminogenic norms, as intermediate measures of prison program effects.

2) Use of pre- and post-achievement test scores to measure change in educational skills due to participation in educational programs.

3) The particular types of education courses (e.g., GED, Literacy, Adult Basic Education, college, vocational, social) that are most effective for increasing commitment to prosocial norms increasing educational skills and reducing recidivism.

4) The types of program delivery that are most effective for normalizing the prison environment, increasing educational ability, and reducing recidivism.

5) The type and amount, if any, of conflict between custody goals and educational program delivery.

6) The relative effectiveness, if any, of various educational program providers (e.g., prison education departments, colleges or universities, local school districts, private contractors).

7) The educational needs of inmate populations.

8) The methods used to encourage inmates to participate in appropriate educational programs.

9) The effects of other normalizing prison operations and programs on both in-prison adjustment and post-release success.

Table 1. List of Variable Names and Their Definitions.

RECID	Coded 1 if the person was rearrested or had parole revoked within 3 years of release from prison, 0 if otherwise.
NPRIOR	Number of prior convictions. This is one measure of what I call criminal momentum; the second is the Salient Factor Score.[7]
SFSCORE	United States Parole Commission Salient Factor Score. The Salient Factor Score is determined by combining points assigned for prior convictions, prior incarcerations, age, the incarceration free period, and criminal justice status at the time of the current offense, and heroin dependency. See Appendix A, for a copy of the Salient Factor Score computation form.
BLACK	Code 1 if black, 0 if white.
HISPAN	Coded 1 Hispanic, 0 if not Hispanic.
MALE	Coded 1 if male, 0 if female.
EDUCPRG	Coded 1 if completed .5 or more courses per each 6 months of prison term, 0 if less than .5 courses for each 6 months of prison term .
PSCORE	The propensity score measuring the conditional probability that a person will not participate in at least .5 courses per each 6 months of his or her prison term.
CODRUG	Coded 1 if incarcerating offense was a drug trafficking offense, 0 if other offense. The comparison group is the miscellaneous offense category.
COPROP	Coded 1 if incarcerating offense was a property offense (e.g, larceny theft, burglary, possession stolen goods), 0 if other offense. The comparison group is the miscellaneous offense category.
COFRGFRD	Coded 1 if incarcerating offense was for forgery or fraud, 0 if other offense. The comparison group is the miscellaneous offense category.
COPERSON	Coded 1 if incarcerating offense was a person crime other than robbery (e.g.,assault, rape), 0 if other offense. The comparison group is the miscellaneous offense category.
COROBB	Coded 1 if incarcerating offense was for robbery (most often bank robbery), 0 if other offense. The comparison group is the miscellaneous offense category.
HEROIN	Coded 1 if the person used heroin five or more times in the 2 years prior to admission to prison for the instant offence, 0 if otherwise.
HEROINMS	Coded 1 if there is missing information regarding heroin use, 0 if otherwise.

Table 1. continued

ALCOHOL	Coded 1 if the person is an alcohol abuser as evidenced by prior arrests for alcohol related crimes (e.g., DUI, public drunkenness); or presentence report accounts of referral to alcohol abuse treatment or other references to a drinking problem, 0 if otherwise.
ALCOHOLMS	Coded 1 if information regarding alcohol abuse is missing, 0 if otherwise.
LSCHYRS	Natural log of the self-reported number of school years completed at the time of admission to prison for the instant offense.
VPPEMPLY	Coded 1 if the person worked full time or was a full-time student for at least 6 months during the 2 years prior to admission to prison for the instant offense, 0 if otherwise.
CJSUPER	Coded 1 if the person was under criminal justice supervision (e.g., parole, probation) at the time he or she committed the instant offense, 0 if otherwise.
LMISCOND	Natural log of the number of misconduct charges plus 1.
FURLOUGH	Coded 1 if the person received at least 1 social furlough during the prison stay, 0 if otherwise.
LTIMESRV	Natural log of the number of days served in prison.
RELEMP	Coded 1 if the person was employed at release from prison, 0 if otherwise.
HFWHOUSE	Coded 1 if the person was released from prison through a halfway house, 0 if otherwise.
LAGEREL	Natural log of the person's age (in years) at the time of release.
FAMILY	Coded 1 if the person resided with a spouse after release, 0 if otherwise.
USCTZ	Coded 1 if the person is a United States citizen, 0 if otherwise.
MISCTZ	Coded 1 if citizenship information is missing, 0 if otherwise.
MILHON	Coded 1 if the person had an honorable discharge from military service, 0 if otherwise. The comparison group is persons with no military service.
MILDIS	Coded 1 if the person had a dishonorable discharge from the military, 0 if otherwise. The comparison group is persons with no military service.
MILDOTH	Coded 1 if discharge from the military was other than honorable or dishonorable (e.g., medical), 0 if otherwise. The comparison group is persons with no military service.
MILDMIS	Coded 1 if military service information is missing, 0 if otherwise. The comparison group is persons with no military service.

COMMUNITY This is the first principal component from a principal component analysis of the following variables for the inmates' home residence ZIP Codes: the Gini Coefficient for household income distribution for 1979; the median household income in 1979; the percent of families with incomes below the poverty level in 1979; the population size in 1980; and the percent of the 1980 population that was black. This variable is used to measure urban socio-economically deprived community background. It is similar to a measure used by Land, McCall, and Cohen (1990) in an analysis of community crime rates. The first principal component explains 79 percent of the common variance. The correlations between the Community measure and each of the variables making it up are the following: 0.434 with the Gini; -0.414 with median household income; 0.533 with poverty; 0.375 with population; and 0.996 with percent black.

ZIP Code Data were obtained from CACI Marketing Systems in Arlington Virginia. The methodology used to obtain ZIP Code estimates was to overlay centroids, defined by latitude and longitude coordinates, of census tracts or, for rural areas, Block Numbering Units (BNA's) on ZIP Code boundary coordinates. If the Tract/BNA centroid fell within a ZIP Code, the Tract or BNA was assigned to that ZIP Code, and 1980 Census data are assigned to the ZIP Code based on the proportion of its area falling within it. The remaining proportion of Tract/BNA data, if any, was assigned to adjacent ZIP Codes according to the proportion of the Tract/BNA area falling within them.

PRD1-PRD5 Dummy variables measuring the successive semiannual periods following release. Each is coded 1 if the observation is for a period, and 0 if otherwise. The reference category is the last semiannual period before the end of the 3-year followup period.

Table 2. Means and Standard Deviations for Variables.

	Full Sample N=1205		Time Served Greater Than 1 Year N=619	
Variable	Mean	Standard Deviation	Mean	Standard Deviation
RECID	0.407470	0.487250	0.386110	0.487250
NPRIOR	3.683817	5.103785	3.810985	5.217733
SFSCORE	5.707884	3.248712	5.733441	3.257309
BLACK	0.282158	0.450237	0.274637	0.446692
HISPAN	0.137759	0.344790	0.129241	0.335737
MALE	0.887137	0.316557	0.930533	0.254452
EDUCPRG	0.292116	0.454924	0.295638	0.456698
CODRUG	0.390871	0.488148	0.439418	0.496718
COPROP	0.165145	0.371466	0.143780	0.351151
COFRGFRD	0.224896	0.417687	0.192246	0.394384
COPERSON	0.029046	0.168004	0.025848	0.158810
COROBB	0.071369	0.257548	0.095315	0.293887
HEROIN	0.204149	0.403246	0.203554	0.402967
HEROINMS	0.054772	0.227629	0.058158	0.234232
ALCOHOL	0.338589	0.473426	0.340872	0.474386
ALCOHOLMS	0.054772	0.227629	0.054927	0.228023
LSCHYRS	2.393269	0.282162	2.393816	0.270431
VPPEMPLY	0.513693	0.500020	0.536349	0.499080
CJSUPER	0.369295	0.482814	0.305331	0.460920
LMISCOND	0.334995	0.580612	0.482594	0.682517
FURLOUGH	0.250622	0.433551	0.436187	0.496312
LTIMESRV	5.881878	0.817957	6.526442	0.406882
RELEMP	0.457261	0.498377	0.542811	0.498567
HFWHOUSE	0.509544	0.500116	0.668821	0.471018
LAGEREL	3.582375	0.261801	3.604833	0.254731
FAMILY	0.332780	0.471404	0.318255	0.466176
USCTZ	0.833195	0.372956	0.852989	0.354404
MISCTZ	0.147718	0.354967	0.129241	0.335737
MILHON	0.236515	0.425118	0.247173	0.431717
MILDIS	0.043154	0.203287	0.048465	0.214921
MILDMIS	0.059751	0.237123	0.045234	0.207986
MILDOTH	0.023237	0.150716	0.019386	0.137989
COMMUNITY	0.000000	2.217000	0.000000	2.241130

Table 3. Coefficient Estimates for Logistic Models Predicting the Probability of a First Recidivating Event for the Entire Sample of 1987 Releasees (N = 1205), 5778 Person Half-Years.

Variable	Coef. Est.	Std. Error	P Value	Coef. Est.	Std. Error	P Value
INTERCPT	2.2795	1.0242	0.0260	1.7689	1.0187	0.0825
SFSCORE	-0.1541	0.0262	0.0001	------	------	------
NPRIOR	------	------	------	0.0434	0.00954	0.0001
BLACK	0.0833	0.1361	0.5405	0.1344	0.1351	0.3198
MALE	0.2081	0.1690	0.2180	0.2529	0.1678	0.1319
EDUCPRG	-0.2211	0.1192	0.0637	-0.2107	0.1190	0.0766
COPROP	0.2017	0.1294	0.1190	0.2363	0.1294	0.0679
HEROIN	0.3143	0.1255	0.0123	0.5721	0.1202	0.0001
HEROINMS	0.3126	0.2556	0.2214	0.2986	0.2618	0.2540
ALCOHOL	0.3128	0.1114	0.0050	0.3359	0.1123	0.0028
ACOHOLMS	0.1235	0.2559	0.6295	0.1644	0.2605	0.5279
LSCHYRS	0.0660	0.1944	0.7344	0.0398	0.1943	0.8376
VPPEMPLY	-0.2664	0.1206	0.0272	-0.3320	0.1202	0.0058
CJSUPER	-0.0167	0.1312	0.8987	0.3392	0.1137	0.0029
LMISCOND	0.1401	0.0905	0.1218	0.1518	0.0906	0.0937
FURLOUGH	-0.4558	0.1628	0.0051	-0.5006	0.1623	0.0020
LTIMESRV	0.0227	0.0755	0.7641	0.0510	0.0760	0.5022
RELEMP	-0.3317	0.1243	0.0076	-0.3567	0.1240	0.0040
HFWHOUSE	0.1258	0.1293	0.3304	0.1284	0.1295	0.3213
LAGEREL	-1.1785	0.2325	0.0001	-1.4078	0.2426	0.0001
FAMILY	-0.3274	0.1436	0.0226	-0.3449	0.1438	0.0165
MILHON	-0.2739	0.1472	0.0627	-0.2406	0.1476	0.1031
MILDIS	0.0672	0.2225	0.7625	0.0489	0.2222	0.8257
MILDMIS	-0.1443	0.2302	0.5308	-0.1742	0.2306	0.4499
MILDOTH	-0.5198	0.3803	0.1717	-0.5106	0.3846	0.1842
COMMUNITY	0.0256	0.0290	0.3774	0.0233	0.0289	0.4203
PRD1	-0.1091	0.1837	0.5527	-0.0973	0.1835	0.5958
PRD2	0.2095	0.1817	0.2490	0.2132	0.1816	0.2402
PRD3	-0.0145	0.1932	0.9400	-0.0113	0.1930	0.9531
PRD4	-0.1607	0.2041	0.4312	-0.1600	0.2039	0.4326
PRD5	0.0325	0.2037	0.8731	0.0384	0.2033	0.8502
-2 LOG L		441.037			425.429	
Hosmer and Lemeshow Goodness-of-fit Statistic		9.1599 (p=0.3290)			10.382 (p=0.2392)	
RSquare[+]		0.0735			0.0710	
Adjusted RSquare[+]		0.1681			0.1623	

[+] See Nagelkerke (1991) for an interpretation of RSquare and Adjusted RSquare.