



Disentangling the effects of correctional education:

*Are current policies misguided?
An event history analysis*

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Abstract

Correctional policies, such as the elimination of Pell Grants to prisoners, often limit inmate educational opportunities. Thus, examination of the possible negative consequences of such actions seems important. Though characterized by some inconsistency, previous research has suggested that post-secondary education within prison has the beneficial effect of reducing recidivism. What is missing is an explicit comparison of the effects of different types of correctional education programs, with a specific focus on discerning the relative effects of college versus non-college education. The present study addresses this issue through analysis of 972 Ohio inmates paroled or released from prison between 1989 and 1992. Our results suggest that college has a substantially stronger negative impact upon recidivism hazard rates than do other forms of correctional education (e.g. high school, GED, vocational education) and imply that, perhaps, the current policy regarding post-secondary correctional education programs is misguided.

Key Words

correctional education • Pell Grant policies • post-secondary education • recidivism

Introduction

The Violent Crime Control and Law Enforcement Act of 1994 contained within it a provision that denied the allocation of federal Pell Grant dollars to inmates. While the bill did not deny college programming to inmates, few prisoners have the resources to pay for college classes. As a result, many colleges and universities have had to close down their prison programs altogether (e.g. see Tewksbury and Taylor, 1996).

Was such federal action ill-conceived policy? Proponents of post-secondary correctional education point to numerous studies suggesting that correctional education works to reduce recidivism by enhancing employability, increasing self-esteem and fostering personal growth (Ayers et al., 1980; Enocksson, 1981; Holloway and Moke, 1986; Knepper, 1990; Harer, 1995; Batiuk et al., 1997; Duguid, 1997; Wilson et al., 2000). But supporters of the 1994 crime legislation suggest that such benefits are overstated as the evidence in support of the crime-reducing effects of correctional education remains inconclusive (see, for example, Lipton et al., 1975; Whitehead and Lab, 1989; Lab and Whitehead, 1990). They argue further that, even if such benefits do accrue in certain contexts (Gendreau and Ross, 1979; Andrews et al., 1990; Lipsey, 1991; Antonowicz and Ross, 1994), the correctional education programs that remain, including Adult Basic Education (ABE), GED, high school and vocational/technical programs, are all that is needed to achieve the desired benefit.

While a definitive answer regarding the soundness of the legislation limiting post-secondary correction education remains elusive, a revisiting of the issue is warranted in order to clarify the veracity of the opposing positions in this debate. One step that seems particularly crucial in this process of re-examination and clarification is a systematic examination of the effects of a college education upon inmate recidivism vis-a-vis the effects of other forms of correctional education. While this inquiry may seem somewhat belated and futile, the stakes here are high. In 1997, for instance, 43 percent of Ohio's parolees returned to prison or jail (Reno et al., 2000). In that same year, Ohio estimates that it spent US\$47.11 on each prisoner per day (Wilkinson and Taft, 2001). Reducing the US\$35.3 million bill that Ohioans had to pay for these recidivating parolees could provide serious relief to already over-taxed state budgets. The present study, therefore, attempts to shed further light on this policy-relevant debate by examining the differential effects of a variety of correctional education programs on post-release recidivism using event-history modeling techniques with a sample of over 900 Ohio inmates.

What *really* works: a review of the literature

In 1969, in an attempt to convert New York prisons from custodial institutions to rehabilitative facilities, the Governor's Special Committee on

Criminal Offenders asked a team of researchers to determine the effectiveness of the state prison system's various treatment programs. Several years later, Martinson proffered a report that boldly stated: 'That on the whole nothing works—that while there may be isolated treatment approaches which seemed effective here and there with certain kinds of groups, on the whole nothing seemed to have any effect on recidivism' (1974: 25). Reviewers of the report seized upon the 'nothing works' portion of the conclusions and interpreted Martinson's message to be that rehabilitation was a futile and unworthy exercise in public policy and public expenditures. Ignored in the ensuing debate was Martinson's very own acknowledgement 'that there may be isolated treatment approaches . . . effective here and there with certain kinds of subgroups'. Those words gave new life to treatment advocates who soon re-directed the line of inquiry from simply asking whether or not programming, in general, worked for all inmates, to examining what types of treatment worked better for what types of offenders, and under what kinds of conditions (Palmer, 1976; Gendreau and Ross, 1979; Lipsey, 1991; Antonowicz and Ross, 1994; Duguid et al., 1998). This study contributes to that on-going inquiry.

Correctional education

While the entire Martinson debate has examined treatment programs of many kinds, this article focuses only upon correctional education programs. Previous research has consistently demonstrated that low academic skills, underemployment and a criminal lifestyle are interrelated (Thornberry and Christensen, 1984; Cantor and Land, 1985; Blumstein et al., 1986; Tewksbury and Vannstrand, 1996). Just as traditional educational institutions promote the successful integration of individuals into society, the goal of correctional education is the re-integration of offenders into society (LeBlanc and Ralnofsky, 1991; Harley, 1996).

Numerous empirical studies have been conducted to ascertain the effectiveness of correctional education. A recent three-state recidivism study conducted by the Correctional Education Association (Steurer et al., 2001) on over 3600 inmates found an overall 23 percent drop in recidivism by those who participated in correctional education as opposed to those who did not participate. Similarly, a 1998 study conducted by the Center on Crime, Communities and Culture concluded that the recidivism rate was inversely related to the educational achievement of the offender, and a cohort study of 18,068 inmates released from the Ohio prison system in 1992 revealed that educational *involvement*, whether actual completion of a program or meaningful participation, was related to reduced recidivism after a two-year follow-up (Anderson, 1995). Thirty years earlier, Cochran (1965) also found that men released from Ohio prisons who had participated in prison educational programs were significantly more successful upon release than non-participants.

Several researchers have conducted meta-analyses of earlier recidivism studies and found mixed results regarding the efficacy of correctional education in reducing recidivism. For instance, Wilson et al. (2000) examined 33 studies scored on the basis of methodological rigor and found that various types of correctional education, as well as correctional work and industries, lowered recidivism. Similarly, Adams et al. (1994) reviewed 90 different studies that incorporated a control group, randomization or matching assignment, statistical controls and tests of significance and found that 'on balance' correctional education leads to a reduction in recidivism but more so for illiterate offenders than for the more educated prisoners (1994: 435). Likewise, the Correctional Education Association (CEA) reviewed 75 studies and concluded that the overwhelming majority of them indicated that all forms of correctional education effectively reduced the rate of recidivism (Tracy et al., 1999). A much earlier analysis by Ryan and Mauldin (1976) also discerned that 67 percent of the studies reported a positive effect of education upon recidivism. While evidence like this seems to point to the value of correctional education, many previous studies have failed to distinguish between different kinds of correctional education. Such an approach masks the potentially unique effects of specific types of correctional education (Lipton et al., 1975; Anderson, 1981; Duguid, 1982; Walsh, 1985; Harer, 1995). Keeping this methodological issue in mind, in the following sections we review studies on different, specific kinds of correctional education.

Pre-college programs

Pre-college programs include high school, Adult Basic Education (ABE) and GED programs. A recent analysis of the effectiveness of pre-college educational programs in Oklahoma found that inmates who completed a GED while incarcerated had a longer survival time outside of prison than non-completers, especially among women (Brewster and Sharp, 2002). In the Ohio cohort study, Anderson (1995) compared pre-college programs across inmate cohorts, and concluded that GED programming appeared to have reduced recidivism the most, while the ABE program appeared to have no effect on the reduction in recidivism. In particular, young black males who had committed less serious crimes and had no prior incarcerations seemed to profit most from GED programming.

Adams et al. (1994) examined 14 methodologically sound studies on pre-college programs and found that nine of them demonstrated a statistically significant lower recidivism rate among those who participated in such programs in comparison to those who did not. Two separate studies conducted by New York State's Department of Corrections (1989, 1992) also indicated a strong relationship between pre-college programming and reduced recidivism. Likewise, Zink's (1970) Delaware-based study found that participants in pre-college educational programs had significantly better outcomes than did non-participants in terms of staying out of prison.

Helping to explain the link between pre-college programming and lower rates of recidivism, other studies indicate that pre-college correctional education is related to post-release education and post-release employment (Anderson, 1981; Adams et al., 1994).

Evidence of the merits of pre-college programming is not conclusive however. An Illinois study that used a matched control group indicated that inmates who earned their GED had higher recidivism rates after a five-year follow-up than those who did not earn such a certificate (Stevenson, 1992). In addition, three studies examined in the Adams et al. (1994) meta-analysis found there to be no relationship between pre-college education and recidivism (Johnson et al., 1974; Anderson, 1981; Roundtree et al., 1982).

Vocational education programs

In the 1970s and 1980s vocational education was heralded as the best method for reducing recidivism because it would: (1) eliminate inmate idleness; (2) provide inmates with marketable skills that would ensure post-release employment; and (3) lower correctional costs through cooperative arrangements with private industry (Schlossman and Spillane, 1995: 2).

Research shows that involvement in prison-based vocational education programs does indeed lead to a reduction in recidivism and increased post-release employment. The Ohio study, with its 18,068-member cohort released from prison in 1992, found that vocational programming was useful in reducing recidivism (Anderson, 1995). Specifically, young female (drug or non-violent) offenders from rural counties had a recidivism rate 9.3 percentage points lower than those in the comparison group. Similarly, a study sanctioned by the Colorado Division of Youth Services found that five years after their first incarceration, the recidivism rate of youthful offenders who received no training was 17 percent higher than those who received vocational training (Wilson, 1994). Wilson suggests, however, that vocational training should be offered to all youthful offenders in conjunction with an academic program for maximum effectiveness. Schumacker et al. (1990) indicate that federal parolees involved in a combination of vocational and academic training had the highest employment rates and the lowest recidivism rates after 12 months of tracking. Numerous other studies also demonstrate statistically significant relationships between vocational education and lower recidivism rates and/or higher rates of post-release employment among a variety of samples, including jail inmates, adult prisoners and juvenile offender populations (Alston, 1981; Anderson, 1981; Schumacker et al., 1990; Anderson et al., 1991; Saylor and Gaes, 1992; Adams et al., 1994; Tewksbury and Vito, 1994; Boyles, 1995). Again, however, the relationship appears equivocal. There are several studies of methodological rigor that find no relationship between vocational education and reduced recidivism (Markley et al., 1983; Lattimore et al., 1987; Downes et al., 1989; Brewster and Sharp, 2002).

Post-secondary education programs

Duguid (1997) argues that college-level programming may be particularly effective at reducing recidivism because it comprehensively affects the thoughts, values and behaviors of student-prisoners. Indeed, Tewksbury and Vannostrand (1996) conclude that there is a solid body of literature that supports the effectiveness of post-secondary education in reducing recidivism. Some of this evidence is presented below.

In their meta-analysis, Wilson et al. (2000) found post-secondary education provided the lowest recidivism rates in comparison to other correctional education programming. Their findings indicate a recidivism rate of 37 percent for post-secondary education as opposed to a 39 percent rate for vocational education, a 41 percent rate for ABE and GED and a 43 percent rate for those involved in multicomponent or other programs (2000: 356). A three-year research project in British Columbia followed 645 federal male prisoners released during the period between 1973 and 1993 who had been students in post-secondary prison programs; only 25 percent of the 654 subjects recidivated in three years following their release, a reduction of 50 percent compared to the Canadian recidivism rate (Duguid et al., 1998). Additionally, in a statewide study in New York, 26 percent of the inmates who earned a college degree in 1986–7 had been returned to state custody by February 1991; for non-graduates, the recidivism figure was 45 percent—a statistically significant reduction in recidivism (New York State, 1991: 1).

In a quasi-experimental, time-series analysis of inmates who left a medium security Ohio prison in 1982–3, Batiuk et al. (1997) found that completion of a two-year college program reduced recidivism by 68 percent. Post-release employment reduced the likelihood of recidivism by 76 percent and accounted for much of the effect of post-secondary education. The researchers concluded ‘college education increases the likelihood of post-release employment, which in turn, reduces the risk of recidivism’ (1997: 175). Similar mediating effects of post-release employment were implied by Adams et al. (1994). Their meta-analysis of 14 college programs found that 10 of them were associated with lower recidivism rates. Not only was the likelihood of recidivism decreased by higher education, but the chances for post-release employment and further education after release were also enhanced by post-secondary correctional education according to their findings (1994: 435). Interestingly, Blackburn (1981) found that inmates in Maryland who earned as few as 12 credit hours in a community college prison program could profit from higher education and were much less likely to recidivate than non-students.

Other researchers have found offender-specific effects of post-secondary education. Anderson (1995), for instance, found that college programming had the greatest impact on reducing recidivism for young female offenders who were incarcerated for first-degree felonies, drug offenses, non-violent offenses and inmates without prior incarcerations.

The present study

On the whole then, a substantial body of methodologically rigorous research has indicated that correctional education does reduce the likelihood of recidivism, sometimes operating through post-release employment and sometimes having effects conditional upon inmate characteristics. One implication of this extant research is that different programs may have differential effects. However, this implication has rarely been explicitly examined empirically. Instead, as the above review indicates, studies tend either to combine various general education programs into one general educational measure, or to examine the effects of specific programs in isolation without controlling for the effects of other programs.

In fact, there is reason to believe that post-secondary education might be particularly effective when considered in comparison with other correctional education programs. In a meta-analysis of treatment programs, Antonowicz and Ross (1994) found that effective treatment programs are cognitively oriented, incorporate techniques that are geared to the learning styles and abilities of the offenders and are led by individuals who are exemplary role-models. Other researchers suggest that cognitive skills alone are simply not enough to desist from crime, but that critical contextual thinking that leads to moral development is necessary if recidivism is to be reduced (Tewksbury and Taylor, 1996). Yet others have found that the most effective educational programming contains intensive small-group interaction and offers a learning community as an alternative to the community within the prison (Gendreau and Ross, 1979; Linden and Perry, 1983; Cullen and Gendreau, 1989; Andrews et al., 1990; Adams et al., 1994). In short, program elements that the literature has identified as ‘best practices’ are often characteristic of college programs in particular.

The present study, therefore, extends the extant literature reviewed earlier by exploring the effects of post-secondary education on recidivism likelihood vis-a-vis the effects of various other types of correctional education, including high school, GED and vocational training. More specifically, we estimate recidivism odds ratios associated with participation in these various educational programs, while controlling for important background characteristics, including age, gender, race, current offense, pre-incarceration education and criminal history. We estimate these ratios in continuous time-event, parametric-based hazard models using the Gompertz parameterization of the hazard function.¹

Data

For this study we gathered data from 972 Ohio inmates. The inmates were selected from the database of the Ohio Department of Rehabilitation and Correction (ODRC) using a disproportionate stratified sampling technique. Inmates who were paroled or released from Ohio’s prisons between 1989 and 1992 comprised the sampling frame, and those inmates in this frame

who had completed a correctional educational program during this incarceration time were stratified according to program type (e.g. GED, high school, vocational and college). The entire strata population of high school and college participants were retained for the final sample, while random samples of the inmate GED and vocational education strata populations were selected. Finally, a control group of inmates paroled or released between 1989 and 1992 but having completed no correctional education programs was randomly sampled from the DRC database.

The data used herein, therefore, utilize naturally occurring groups as opposed to random assignment into various treatment groups. While the ideal design for recidivism studies is the true experiment, such methodology is often not feasible due to: (1) the ethical dilemmas associated with randomization; and (2) the structural obstacles associated with providing 'treatment' to subjects in a contained environment where security issues are paramount (over and above issues of research integrity) and where there is an ever-changing population due to transfers, paroles and rules infractions (Tracy et al., 1999). Because of these ethical and structural problems, quasi-experimental designs, such as cohort studies, have become a viable alternative. Cohort designs offer a number of advantages: a relatively large sample, inclusion of participant and non-participants in the sample and a sufficient passage of time for a follow-up of any recidivism that may have occurred (Adams et al., 1994; Tracy et al., 1999).

Still, quasi-experimental designs also have their problems, one being the issue of self-selection (Gerber and Fritsch, 1995; Tracy et al., 1999). Although policy-makers sometimes assume those who voluntarily participate in educational programs are more highly motivated than those who do not, there is not strong empirical evidence to support this. Fagan (1989) examined several factors affecting the learning of 26 prisoners and 26 non-prisoners in Canada and found that the prisoners indicated that they enrolled in a literacy program just to pass time rather than to fill gaps in skills and knowledge that could enhance their futures. Similarly, Ryan and McCabe (1994), using a sample of 100 percent of the participants enrolled in a prison literacy program and controlling for a number of demographic variables, found no statistically significant differences in achievement between those participating in voluntary prison education and those participating in mandatory prison education programs. As such, while we recognize the limitations of quasi-experimental data, we also feel confident that they can yield meaningful results.

Table 1 provides a descriptive summary of the characteristics of inmates completing the various correctional education programs under study here. Characteristics of the groups of inmates participating in no correctional education programs are also displayed. As Table 1 suggests, program participation varied substantially according to background characteristics of sampled inmates. For instance, female inmates appeared most likely to participate in vocational education; for males, the most popular program was GED. White inmates appeared most likely to participate in GED,

Table 1. Characteristics of program participants^a

	<i>College (%)</i>	<i>GED (%)</i>	<i>Vocational (%)</i>	<i>High school (%)</i>	<i>Non-education (%)</i>	<i>Total (%)</i>
Gender ($\chi^2 = 25.58$, d.f. = 4) ^b						
Female	21.7	31.9	36.2	0.0	10.1	100
Male	11.6	33.0	18.7	5.4	31.2	100
Race ($\chi^2 = 64.48$, d.f. = 4) ^b						
White	15.5	41.2	19.1	4.5	19.8	100
Non-white	9.3	25.2	20.7	5.6	39.2	100
Age ($\chi^2 = 76.27$, d.f. = 4) ^b						
Under 30	5.6	46.1	10.1	6.2	32.0	100
Over 30	16.2	25.3	25.7	4.4	28.4	100
Priors ($\chi^2 = 34.83$, d.f. = 12) ^b						
None	12.3	35.3	15.9	6.3	30.1	100
One	11.8	31.4	24.3	2.4	30.2	100
Two	13.3	21.1	35.6	2.2	27.8	100
Three (+)	12.8	25.6	35.9	0.0	25.6	100
Offense ($\chi^2 = 51.05$, d.f. = 8) ^b						
Violent	21.2	31.8	20.2	3.0	23.7	100
Property	10.6	34.5	21.3	7.9	25.8	100
Drug	9.0	30.8	17.3	1.1	41.7	100
Education ($\chi^2 = 41.91$, d.f. = 4) ^b						
Under 11 years	6.4	40.8	18.5	5.8	29.5	100
Over 11 years	18.1	26.1	21.0	4.6	29.9	100

^a The total sample size is 972^b $p < 0.05$

whereas 39 percent of the non-white sample inmates participated in no programs. Younger inmates in the sample seemed very likely to participate in the GED program, whereas program participation is much more varied among inmates over 30 years of age. The GED program appeared to be the most popular among inmates with few priors (none or one), while inmates with more extensive records leaned more heavily toward vocational education programs. Table 1 also indicates that violent and property offenders were most likely to participate in GED programs, whereas drug offenders most often opted for no education. Lastly, those inmates with less than 11 years of prior education were most involved in GED programs and those inmates who had more than 11 years of education seemed most likely to participate in no educational programming during this incarceration. In terms of describing the college participants specifically, Table 1 suggests that there are higher rates of participation in this program for women as opposed to men, whites as opposed to non-whites, older as opposed to younger inmates, more educated versus less educated and violent as opposed to property or drug offenders.

Measures of variables

The dependent variable for event history analysis is the 'recidivism hazard' during the study period (1989–2003). The recidivism hazard function 'expresses the instantaneous risk of having the event (recidivism) at time t , given the event did not occur before time t ' (Yamaguchi, 1991: 9). This hazard was calculated based upon the date the respondent was released versus the date they returned to prison in Ohio for any reason, including parole revocation, through January 2003 (up to 13.5 years from release).² On average, sample inmates recidivated within approximately 77 months of their release date, but the variation was substantial (approximately 56 months).

Metrics and descriptive statistics for all explanatory variables are summarized in Table 2. The key explanatory variables of interest here are the various indicators of correctional education program participation. A series of five dummy variables (1 = yes; 0 = no) were included, measuring whether or not the respondent participated in (1) college, (2) high school, (3) GED, (4) vocational training and (5) no education while incarcerated. As Table 2 suggests, 12 percent of the sampled subjects were graduates from post-secondary correctional education. Those completing college programs earned an Associate's Degree, which is an equivalent of 180 hours of instruction. Moreover, 5 percent obtained a high school diploma while incarcerated, 33 percent obtained a GED and another 20 percent completed a vocational program in prison. The effects of these variables will be viewed in reference to the omitted category—subjects participating in no educational programs—representing 30 percent of the total sample.

In examining the effects of the various correctional education programs on recidivism risk, we also controlled for potentially important background

Table 2. Variables, metrics and descriptive statistics for explanatory variables^a

Variables	Metrics	Descriptive statistics			
		Mean	SD	Min.	Max.
Gender	(0 = female, 1 = male)	0.93	0.26	0	1
Race	(0 = white, 1 = non-white)	0.52	0.50	0	1
Age	(0 = under 30, 1 = over 30)	0.63	0.48	0	1
Priors	(number of priors)	0.48	0.88	0	5
Education	(number of years)	10.58	1.36	5	16
Violent offense	(0 = no, 1 = yes)	0.20	0.40	0	1
Property offense	(0 = no, 1 = yes)	0.53	0.50	0	1
Drug offense	(0 = no, 1 = yes)	0.26	0.44	0	1
Non-education	(0 = no, 1 = yes)	0.30	0.46	0	1
High school	(0 = no, 1 = yes)	0.05	0.22	0	1
GED	(0 = no, 1 = yes)	0.33	0.47	0	1
Vocational	(0 = no, 1 = yes)	0.20	0.40	0	1
College	(0 = no, 1 = yes)	0.12	0.33	0	1

^a The total sample size is 972

characteristics, including age, gender, race, offense type, prior education and criminal history. Age was measured with a dichotomous variable (1 = yes; 0 = no) indicating whether the respondent was over 30 years of age. Gender and race were, likewise, dummy coded (male = 1 and non-white = 1; female = 0 and white = 0). As suggested by the figures presented in Table 2, the sample was 93 percent male, 52 percent non-white and 63 percent were over 30 years of age. In terms of prior prison educational level, the average years of education of this sample was 10.58 with a minimum of 5 and a maximum of 16. Offense type was measured by way of three dummy variables, indicating whether the subject was incarcerated most recently (e.g. current offense) for a violent offense (1 = yes; 0 = no) or a property offense (1 = yes; 0 = no) or a drug offense (1 = yes; 0 = no). As Table 2 shows, the bulk of the sample inmates were property offenders (53%). Drug offenses represent the reference category for these offense-type dummy variables.³ Finally, we operationalized criminal history as the number of prior adult convictions. This was a continuous variable, ranging in our sample from zero to five. On average, sample inmates had less than one prior adult conviction.

Results

The major objective of our research was to examine the effect of college and other educational programs on the recidivism hazard while controlling for possible extraneous influences. Figure 1 illustrates the different hazard functions for the various educational groups characterizing the sample. As can be seen, those subjects receiving college education have a substantially lower hazard rate than do those in other groups. As such, their time to

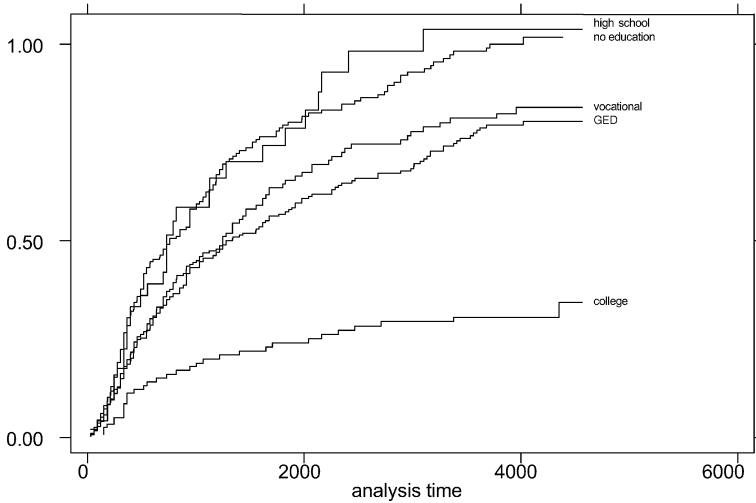


Figure 1 Nelson-Aalen cumulative hazard estimates, by correctional-educational program type

recidivism upon release is substantially greater than those subjects in other groups.

Table 3 explores this issue in further detail and displays results from the Gompertz hazard model of recidivism on educational program participation and other background characteristics. As is standard in event history analysis, the hazard ratios are reported along with coefficient estimates and standard errors. The hazard ratio is the exponentiated regression coefficient, and can be converted into the percentage increase or decrease in recidivism hazard rate per unit change in an independent variable. This is done as: $(\exp(bx) - 1) * 100$.

The significant negative coefficient (b) for the effect of college, shown in

Table 3. Gompertz event history model of recidivism

<i>Independent variables</i>	<i>Coefficient</i>	<i>SE</i>	<i>Exp. (coeff.)</i>
Age	-0.24 ^a	0.08	0.79
Race	0.55 ^a	0.16	1.74
Gender	0.03	0.19	1.03
Priors	0.18 ^a	0.06	1.20
Education	-0.04	0.03	0.97
Violent	0.09	0.15	1.09
Property	0.31 ^a	0.16	1.36
College	-0.97 ^a	0.07	0.38
GED	-0.17	0.09	0.84
Vocational	-0.21	0.10	0.81
High school	-0.02	0.19	0.98

^a $p < 0.05$; Gamma: -0.00066 (0.000047)

Table 3, suggests that participation in post-secondary educational programs reduces the recidivism hazard rate. Conversely, this effect suggests that college has a positive effect on time to recidivism (survival time). The exponentiated coefficient for the college variable suggests that participation in post-secondary education programs reduces the recidivism hazard rate by some 62 percent in comparison to the non-education group. Moreover, and most important for purposes of this study, the college variable proved to be the only educational program variable to significantly decrease recidivism hazard rates (or increase survival) when compared to the 'no education' group, as the omitted/reference category.

Findings from Table 3 also show that age and race are significant predictors of recidivism hazard. The exponentiated coefficient for the age variable suggests that the hazard rate declines by approximately 21 percent for inmates over the age of 30 as compared to those under the age of 30. This finding is consistent with substantial past literature which suggests that criminal offending decreases as age increases. The finding between race and recidivism is also consistent with previous research (Harer, 1995). Findings here indicate that nonwhite inmates have a 74 percent higher recidivism hazard rate as compared to white inmates.

Last, prior criminal history and current property offense have significant, positive effects on the recidivism hazard. With each additional prior conviction on their record, the hazard rate increases by approximately 20 percent. Likewise, compared to drug offenders (i.e. the reference category), inmates serving time for property offenses have a 36 percent greater hazard rate; the effect of violent offending was non-significant.

Conclusion and discussion

'Education in prison is generally recognized to be a good, humane, personally beneficial activity' (Duguid, 1982: 53). Based upon this idea, quite a large body of research has emerged examining the relationship between prison education programs and recidivism. However, much of this previous work combines various educational programs under the umbrella of 'prison education' and fails to clarify the particular, individual effects of each type of educational program (Adams et. al., 1994; Anderson, 1995; Steurer et al., 2001). Moreover, those studies that did investigate individual effects of programs on recidivism typically focused on the effects of one type of program only (Anderson, 1995). This study improves methodologically on past research by disentangling the variety of prison educational programs and investigating the respective effects of high school, GED, vocational, college programming and even non-education upon recidivism within one statistical model.

In the present study, inmates who completed college programs had significantly lower rates of recidivism than inmates who completed no education programs. The results for college program participation are

similar with past studies that examined the effect of post-secondary education alone on recidivism (Adams et al., 1994; Batiuk et al., 1997; Duguid, 1997). However, this study adds to the extant correctional education literature by showing that college participation reduces recidivism *net of the effects of other types of correctional programs*. The current study also found that none of the other educational programs examined had such a strong effect on the rate of recidivism when compared to no education. Thus, college participation has the *solely significant* negative effect on recidivism when compared to the other three programs measured.⁴

This finding supports a rethinking of the current policies that stifle opportunity for post-secondary correctional education. Faced with evidence of the obvious potential importance of post-secondary education in reducing recidivism, especially in comparison to the smaller effect of the programs that remain in prison (e.g. vocational, high school, GED), policy-makers should re-assess the methods by which Pell Grant dollars are distributed to inmates in the future. Given the magnitude of these decreases in recidivism, if only one-half of the 1997 recidivating parolees in Ohio (studied by Reno et al., 2000) had received a two-year college degree (utilizing federal Pell monies), taxpayers might have saved millions of dollars in re-incarceration costs. From the findings of this study, it seems that intact educational programs do not appear to offer the same potential as college in terms of reducing recidivism.

Although these findings offer new insights into the relationship between post-secondary education and recidivism, some limitations still constrain our results. First, our sample only included information from one Mid-western state—Ohio. Previous research indicates that other regions of the country, such as the northeast, offer a greater variety of educational programs (Morash et al., 1994). It would be wise to not only expand this examination to other regions of the country but to also investigate a greater number of college programs and a greater variety of college programs. Along these lines, more detailed data speaking to the nature of post-secondary correctional education programs would provide a deeper understanding of the impact of college programming on recidivism. Although this study did stress the importance of post-secondary education on recidivism, it did not assess the ‘mechanisms’ by which college programming is successful. As discussed previously, there are myriad factors that may relate to why college works. It may be the emphasis on critical thinking and moral development, the benefit of small-group interactions, the respite from the prison subculture, the resulting increased employability or some combination thereof, that makes post-secondary correctional education so effective in reducing recidivism likelihood (Gordon and Arbuthnot, 1987; Antonowicz and Ross, 1994; Tewksbury and Taylor, 1996; Batiuk et al., 1997; Wilson, 2000). The only way to shed light on these questions is through future in-depth analyses, perhaps using more qualitative approaches.

Finally, since a true experimental design, with random assignment into

treatment groups was impossible, there are self-selection effects that may be operating in reducing recidivism among the college group as opposed to participants in other programs. Those engaging in post-secondary education may have higher levels of motivation, self-discipline, and so on, making them less likely to recidivate even without a college degree. Thus, without controlling for these possible self-selection criteria, we must view and use these findings with caution. Still, despite the limitations of the present study, we provide substantial evidence that the ill-fated college programs may be particularly more promising in reducing recidivism in comparison to the correctional education programs that remain intact in today's prisons.

Notes

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- 1 Although technically the data are measured somewhat discretely (months 'surviving' without recidivism), given the large time frame of the study (10 years), this approaches a continuous measurement. Since continuous time models are much more efficient we elected to use that option as opposed to a discrete time model. Parametric models were used instead of proportional hazards models because they also are more efficient, and the shape of the hazard appeared to meet necessary assumptions of this model (e.g. decreasing monotonically). Finally, we chose the Gompertz model as the particular parameterization of the hazard function because it has been shown to be applicable when the transition rate changes monotonically with time (Blossfield and Rohwer, 1995: 166).
- 2 The FBI's Careers in Crime Study (1967) used re-arrest as the indicator of recidivism. This usage was justified on the basis that it compensates for those re-arrested but who were freed for legal or technical reasons even when, in fact, they did commit the crime. However, the FBI also acknowledges the re-arrest definition may include people who are not guilty. Tracy et al. (1990) contend that re-arrest overly represents recidivism and that correctional professionals think re-conviction and re-incarceration reflect the true rate of recidivism. That perception explains why many state and national studies on recidivism use 'return to prison' as the operational definition (Ohio Department of Rehabilitation and Correction, 1995; Duguid et al., 1998).
- 3 It should be noted that there were 17 additional subjects originally sampled but with offenses that were unable to be classified as either 'violent', or 'property', or 'drug'. These few subjects with 'other offenses' were deleted from the sample for analysis purposes.

4 However, as Figure 1 reveals, several of the correctional education programs are clustered together, suggesting that there may be alternative ways to run the analysis. Based upon the clusters revealed in Figure 1, we re-ran the model presented in Table 3 with participation in GED and vocational combined (a new dummy variable created representing participation in either program) and participation in high school and no education similarly combined as the reference category. In this model, the effect of college remains unchanged, but the effect of GED/vocational becomes marginally significant ($p < 0.10$), suggesting a 17 percent decline in the recidivism hazard. While this still appears much less impressive than the effect of college, it does appear that participation in GED or vocation can create a modest decline in the recidivism hazard.

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