Published in final edited form as:

Crime Delinq. 2013 October ; 59(7): 915–1005. doi:10.1177/0011128710389588.

Does Prison-Based Adult Basic Education Improve Postrelease Outcomes for Male Prisoners in Florida?

Rosa Minhyo Cho¹ and John H. Tyler¹

Brown University, Providence, RI

Abstract

The authors use administrative data from Florida to determine the extent to which prison-based adult basic education (ABE) improves inmate's postrelease labor market outcomes, such as earnings and employment. Using two nonexperimental comparison groups, the authors find evidence that ABE participation is associated with higher postrelease earnings and employment rates, especially for minorities. The authors find that the relationship is the largest for ABE participants who had uninterrupted ABE instruction and for those who received other education services. However, the results do not find any positive effects of ABE participation on reducing recidivism.

Keywords

adult basic education; prison; earnings; employment; recidivism

Over the past three decades, the convergence of several social and economic forces has worked to alter the size, face, and nature of the U.S. penal system. In terms of the size of the penal system, changes in criminal justice policies associated with the wars on drugs and crime mean that more convictions now lead to a prison sentence than in the past, and the sentences tend to be of longer duration than in the past. The most obvious result of these policy shifts is a rising penal population. There are currently more than 1.6 million prisoners incarcerated in U.S. state or federal prisons (West & Sabol, 2009). Of particular relevance for the topic of this article is that the majority of offenders who are incarcerated lack basic educational and employment skills. It is reported that about 68% of U.S. state prison inmates do not hold a high school diploma (Harlow, 2003). In Florida, a state that houses the third largest number of prisoners behind California and Texas, nearly 80% of the prison inmates are reported to test below the ninth grade literacy level (Office of Program Policy Analysis and Government Accountability [OPPAGA], 2000). As almost all prison inmates will eventually be released, prison-based programs that can help ex-offenders with low levels of education more successfully reintegrate into society by increasing their cognitive skills can be a critical element of the penal experience. Perhaps in recognition of this, most prisons

© 2010 SAGE Publications

Corresponding Author: Rosa Minhyo Cho, Department of Education and Public Policy, Brown University, Providence, RI 02912, rosa_minhyo_cho@brown.edu.

Declaration of Conflicting Interests

The author(s) declared no potential conflicts of interests with respect to the authorship and/or publication of this article.

offer educational opportunities to their inmates. In 2000, 91% of state prisons and all federal prisons reported offering educational opportunities to their inmates (Harlow, 2003).

The current prison system offers various educational programs that are intended to promote a wide range of skills, from basic reading and writing to life skill training programs (Cecil, Drapkin, Mackenzie, & Hickman, 2000). Studies examining the effects of such programs on postrelease outcomes have found at best mixed results. Some studies find that academic educational programs are more effective in reducing recidivism than vocational or life skill programs (Brewster & Sharp, 2002; Cecil et al., 2000; Jensen & Reed, 2006), whereas others argue that participation in any in-prison educational program is beneficial for inmate rehabilitation (Gordon & Weldon, 2003; Jancic, 1998; Jenkins, Streurer, & Pendry, 1995; MacKenzie, 2000; Wilson, Gallagher, & MacKenzie, 2000).

In general, however, there may well be reason for concern about our knowledge base when it comes to the effectiveness of prison-based educational programming. Examination of the correctional evaluation literature suggests an overabundance of studies that fail to do an adequate job of making the treatment and comparison groups truly comparable both in terms of observed and unobserved characteristics (Wilson et al., 2000). The purpose of this article is to provide a rigorous examination of the effect of prison-based academic training, specifically the effect of adult basic education (ABE) programs on postrelease labor market outcomes. By definition, ABE programs provide education to individuals who are reading below the ninth-grade level. Once participants can read at the ninth-grade level, they can move on to adult secondary education (ASE) classes, which are almost universally geared toward preparation for the general educational development (GED) exams. Thus, in theory, many prisons offer a sequence of courses that could advance one from very low reading and math levels to skills commensurate with GED acquisition or even postsecondary education. For the large portion of offenders who enter prison with very low skills, this process starts with ABE coursework, and some states require ABE participation for inmates who test below a certain threshold level of proficiency. In Florida, for instance, inmates are mandated 150 hr of literacy education if they test below the ninth-grade level.¹

We focus on examining the effect of ABE programs mainly because it comprises one of the largest educational programs offered currently in state and federal prisons (in Florida, for example, the number of high school dropout inmates enrolled in ABE is larger than the number enrolled in GED programs)² and also because a significant amount of inmates enter prison with literacy levels below the ninth-grade level and exit prison before participating in or completing a more advanced academic program, such as the GED.³ Compared to the number of studies examining the effect of prison-based GED programs, studies evaluating the effectiveness of ABE programs are scarce and often poorly designed (Cecil et al., 2000).

¹The statute exempts certain inmates, such as those serving a life sentence or housed at a work camp. Section 944.801, F.S. (OPPAGA, 2000).

²According to a report from the Bureau of Justice Statistics (Harlow, 2003), the two most common educational programs provided in state or federal prisons were adult basic education (ABE) programs and adult secondary education (ASE) classes. 80.4% of state prisons and 97.4% of federal prisons offered ABE programs in 2000, whereas 83.6% of state prisons and 98.7% of federal prisons offered ASE classes. However, there were lesser opportunities to enroll in vocational programs (55.7%) or college courses (26.7%), especially in state prisons.

³In our sample of adult male inmates in Florida State Prison, we find that more than 70% of total inmates enter prison with literacy levels below the ninth-grade level, whereas the average length of prison stay is less than a year and a half.

Many of the studies had methodologically flawed research designs, most failed to control for individual demographic factors that can influence inmates' postrelease outcomes, and there were significant differences in the quality of instruction (e.g., length) in the ABE programs. Among those that do exist, the results are mixed. For example, Walsh (1985) found that participating in ABE reduces the rearrest rates of probationers, whereas the Ohio Department of Rehabilitation and Corrections (1995) found that ABE participation alone is not effective in lowering the rate of return to prison. They found that it is only effective when ABE participation is combined with a long prison stay (4 or more years).

Using rich administrative data from several state agencies in Florida, we attempt to improve on the existing literature by accounting for variation in the persistence of ABE program participation as well as for participation in other prison-based programs. We are able to observe the extent to which ABE in Florida prisons is characterized by continuous, uninterrupted participation or by stops and starts in program participation over time. We are also able to observe interruptions to ABE participation that may be related to movements across prison facilities during program participation. The wide array of variables in the Florida data allow for a rich set of covariates that we use in constructing a suitable comparison group against which to judge the outcomes of ABE participants. Meanwhile, the panel nature of our data allows us to control for unobserved, time-invariant individual fixed effects. This is a definite improvement in the literature because we are not only able to identify the impact of ABE program participation on postrelease employment, earnings, and recidivism, controlling for selection bias, but also explore how ABE participation might or might not be related to postrelease outcomes by examining inmates' coursetaking behavior throughout his entire prison stay.

As a result, the most elementary yet most empirically significant contribution of this article is our ability to analyze longitudinal data on a large population-based sample. Specifically, we use panel data on 13,137 male inmates who entered the Florida state prison system over an 8-year period. The data we use contain information on an inmate's earnings prior to and after incarceration; a detailed history of his prior criminal justice history; rich information on prison-based program participation, including number of hours, program start and stop dates, and the facility where the programming took place; detailed demographic information, including race, age, highest level of education, and prior employment history; and a measure of cognitive skills at the time of prison entry.

Analytic Strategy

Constructing the Treatment and Comparison Groups in the Florida Data

Despite the importance and prevalence of prison-based ABE programs, the literature examining the impact of these programs on postrelease outcomes is relatively limited. Of the studies that do exist, most examine the impact of ABE participation on recidivism (Aos, Miller, & Drake, 2006; Gordon & Weldon, 2003; Jensen & Reed, 2006; Nuttall, Hollmen, & Staley, 2003). Primarily due to data limitations, there are few studies that examine impact on postrelease labor market outcomes. A 2006 review by Aos et al. listed five studies that dealt with *basic adult education programs in prison*. Their examination of these studies reports an average reduction in recidivism of about 5% for ABE program participants. It is difficult,

however, to assess the rigor of these studies. Only one of the studies in the Aos et al. report has undergone peer review, and four of the five are unpublished reports or working papers. One of these unpublished reports, Harer (1995), represents a rigorous attempt at examining program impact, but it appears that the treatment variable in this study is not ABE participation but rather participation in any correctional education program. Thus, even though the Harer study is well done, it is not clear what we learn about ABE impact from this work.

In theory, one would expect that participating in ABE programs might increase the earnings or employment rates of inmates after release from prison by increasing their human capital. However, there may be several reasons why ABE programs may not be so effective. For example, inmates may not be taking enough ABE hours as are necessary to truly alter their skills in the long run. It is also possible that inmates may not have the opportunity to get high-quality education because of frequent disruptions in course taking. That is, ABE education “as delivered” in our nation’s prisons may fall far short of ABE “as designed” or imagined in the ideal. At least in a limited sense, we will be able to examine these issues.

To identify the effect of a program, most of the stronger methodological papers on prison-based education employ a standard treatment and comparison group strategy comparing the postrelease outcomes of program participants to nonparticipants (Aos et al., 2006; Gordon & Weldon, 2003; Jensen & Reed, 2006; Nuttall et al., 2003). This strategy produces the effect of participating in the program (Heckman, Lalonde, & Smith, 1999). However, it provides little insight into the effect of the program on those who actually receive it because many ABE participants drop out of their courses prematurely. Also, a significant portion of ABE nonparticipants enroll in other academic or vocational programs that may improve their labor market prospects. In this article, we estimate the effect of both participating in ABE coursework and completing ABE coursework separately, controlling for inmate’s demographics and criminal justice history.

An inmate is considered to be participating in the ABE program (hereinafter, *ABE participant group*) in our analysis if he is observed to be taking any ABE classes, literacy classes, or cognitive life skill classes during his prison spell. An inmate is regarded to have completed the ABE program (hereinafter, *ABE completion group*) if his enrollment status is coded as completed, attained educational objective, or completed class except test. Because inmates are typically enrolled in more than one ABE class at the same time, an inmate is regarded to be in the ABE completion group if he completes at least one ABE course.

The effect of ABE participation provides an estimate that is similar to the *intent-to-treat* estimate in other experimental studies, whereas the effect of ABE completion provides an estimate that is similar to the *treatment-on-the-treated* estimate. In terms of public policy, one can think of the intent-to-treat estimate as the average effect of ABE programs as is currently provided by the criminal justice system, whereas the treatment-on-the-treated estimate reflects the average effect of ABE programs in an ideal setting where inmates complete the course and attain their educational goals during their prison term. In our analysis, we restrict the sample of ABE participants to include only individuals who do not

hold a high school diploma.⁴ We omit high school graduates because these individuals may differ on unobservable dimensions relative to dropouts.

To proxy the counterfactual outcome, the postrelease outcomes of inmates had they not participated in (or completed) the ABE program, we use two comparison groups: (a) high school dropout inmates who did not participate in any ABE course work or any other academic classes and (b) high school dropout inmates who participated in ABE programs but involuntarily dropped out within 21 days or less because of reallocation or release and also did not participate in any other academic classes. We assume that the ABE training inmates in the second comparison group receive prior to involuntarily dropping out has negligible effects on postrelease outcomes. Although the use of the second comparison group has its limitations (because of the necessary assumption stated above), it provides a better estimate of the effect of ABE training as we are able to control for unobserved individual heterogeneity with regard to one's selection into ABE classes in the first place. Because inmates are constantly moved across facilities to balance prison populations, maintain institutional security, and address organizational priorities, these prison movements are usually exogenous from any preexisting trait or condition that may be correlated with postrelease labor market outcomes (OPPAGA, 2000).⁵ However, it is still possible for some transfers to be endogenous to postrelease outcomes because inmates in Florida state prisons can also be transferred across facilities because of special needs (e.g., health, security, and education) or personal reasons (e.g., to live within short distance from close relatives). Yet, as is stated in the official web site of the Florida Department of Corrections (FDOC), it is extremely rare for an inmate to be transferred because of personal reasons, such as family visitation (retrieved from <http://www.dc.state.fl.us/oth/inmates/transfers.html>). Specifically, in the year of 2008, 94% of all transfers are reported to have occurred to meet the priority needs of the FDOC or of the inmate (retrieved from http://www.dc.state.fl.us/orginfo/leg/2010Session/Senate_CJ_11-4-09_Classification.ppt). In addition, transfers to meet institutional and security priorities are reported to necessarily take precedence over inmates' program needs (OPPAGA, 2000).

To further account for differences in cognitive functioning on prison entry, we control for inmate scores on the Tests of Adult Basic Education (TABE), which are used to assess the levels of literacy and numeracy of each inmate as he enters a Florida state prison. In Florida, every criminal justice offender whose conviction and judgment leads to a prison sentence begins their journey through the state penal system at one of several designated reception centers. At these intake points in the system, each entering offender's mental, physical, and cognitive functioning levels are assessed. Cognitive functioning in the reception center is assessed via administration of the TABE Survey test battery, with scores reported as grade equivalents ranging from 0 to 12.9. Importantly, there are no selection issues with the TABE scores because every new prisoner is required to take the exams. Also, it is unlikely that TABE test scores in this setting are endogenous to postrelease outcomes, and because

⁴The majority of inmates taking ABE classes do not hold a high school diploma— about 91%. Including both high school graduates and dropouts, ABE participants have on average 9.5 years of education.

⁵In fiscal year 1999–2000, for example, 68% of inmate exits from academic programs in Florida prisons were because of inmate transfers across facilities (OPPAGA, 2000).

inmates are tested immediately at the point of prison entry, the test scores we use are not confounded with the participation of any prison-based program. An advantage of accounting for preprison cognitive functioning levels is that it will prevent us from underestimating the relationship between prison-based ABE and postrelease outcomes because inmates who select into ABE coursework will generally have lower cognitive skills than inmates who do not. This also translates into reduced selection on unobservable characteristics.

Data

We use a unique data set that was constructed through the cooperation of three state agencies in Florida. The FDOC, the Florida Department of Law Enforcement, and the Florida Education and Training Placement Information Program worked together to collect and merge data from their respective agencies for our use. The result is a data set containing individual-level demographic, criminal justice history, and incarceration information, along with state Unemployment Insurance (UI) wage records. Using these data, we examine the relationship of participating in ABE classes and quarterly earnings as measured by UI wage records and quarterly employment rates as measured by nonzero UI quarterly wage records.

Our analytic data file consists of a sample of men who (a) entered prison after October 1, 1994, and (b) had forecasted release dates that were early enough to allow for at least 12 quarters of postrelease employment data.⁶ Although we have information on prison admissions prior to October 1, 1994, we only include men admitted after this date in the sample because a change in the sentencing regime allowed inmates who entered prison prior to October 1994 to serve much less time in prison than subsequent offenders.⁷ Although there was another change in Florida sentencing policy in 1995 mandating that all inmates, regardless of the type of crime they committed, serve a minimum of 85% of their sentences, this does not appear to cause any selection in the current sample because all inmates in our sample admitted after October 1, 1994, appear to have been serving more than 85% of their sentences even before the actual passage of this law. The second restriction is imposed because of our desire to observe at least 12 quarters of postrelease labor market outcomes. Given the UI wage records at our disposal, this means that none of our sample members entered prison after February 1999. In our analyses, we use the forecasted release date of each inmate instead of the actual release date as the actual release date may be endogenous to the receipt of prison-based programming, including ABE.⁸

We have a total of 5,172 male inmates in the ABE participant group, and 7,666 inmates in the nonparticipant group (i.e., first comparison group). Among the inmates who participate

⁶We also dropped inmates (a) who were missing important demographic information (such as race, ethnicity, education level, or admission test [Tests of Adult Basic Education; TABE] score), (b) who never left or entered a state prison facility during the sample period, (c) who were not initially assigned to a correctional institute, or (d) who were assigned to a private prison facility. These people comprised about 7% of the sample.

⁷Individuals admitted to a Florida prison prior to December 1994 were eligible for *control release*. Control release is an administrative function that was used to manage the state prison population within lawful capacity. In the era of control release, many inmates were not in prison long enough to participate in academic programs and were likely different in important ways from prisoners who were admitted after December 1994. We use people who were admitted on or after October 1, 1994, because in our data no offenders admitted during October and November of 1994 were given a control release.

⁸Using forecasted release date instead of actual release date is based on the idea from Tyler and Kling (2006). They were concerned that prisoners may affect their actual release date through good behavior and thus created forecasted release dates based on the sentence length and time served in jail prior to prison admission.

in the ABE classes, there are 2,267 who complete at least one of the courses and 2,905 who fail to complete any of the courses. Among the ABE noncompleters, there are 328 inmates who involuntarily dropout of class within 21 days or less because he is reallocated to a different facility or because he is released from prison (i.e., second comparison group). As some individuals in our data enter and exit prison more than once during the sampling period (i.e., they have more than one prison spell), the total number of prison admission spells is slightly larger than the number of inmates. In Table 1, we present descriptive statistics on four groups of inmates—ABE completers, ABE participants but noncompleters, ABE nonparticipants, and ABE involuntary dropouts.

First, among inmates who participate in ABE, we find some noticeable differences between those who complete the program and those who do not (columns a and b). In general, the completers have higher cognitive skills (i.e., TABE scores) at the point of prison entry and stay in prison for a longer time period. They are more likely to have been committed for violent crimes and less likely to be minority. They generally have longer prison spells and are more likely to participate in other prison programs, such as vocational training, substance abuse treatment, or work release programs, than noncompleters. Finally, completers are more likely to have been employed and have earned more money prior to prison entry than noncompleters.

Next, when we compare all inmates who participate in ABE (both completers and noncompleters) to those who do not participate (columns 1 and 2), we find that the nonparticipants are noticeably less disadvantaged than the participants in terms of several demographic characteristics. Specifically, nonparticipants are less likely to be minority, more likely to serve shorter prison spells, and less likely to be committed for violent crimes. At the time of prison entry, they are older and have higher cognitive skills. Even in terms of economic characteristics, nonparticipants have higher employment rates and average earnings compared with participants prior to prison entry. However, a much higher proportion of nonparticipants are repeat offenders (51% vs. 30%–32%), suggesting that they may have already obtained the necessary ABE training and skills during prior prison spells. Still, based on these observed differences, there appears to be a negative selection process in ABE enrollment in which those who enroll in ABE courses possess characteristics that are negatively correlated with higher earnings or employment. This confirms our concerns about the validity of previous studies that simply compare the outcomes of ABE participants and nonparticipants without appropriately controlling for both observed and unobserved characteristics.

The difference in observed characteristics between ABE participants and the second comparison group, involuntary dropouts, is not as pronounced (columns b and 3). This is not surprising given that inmates in both groups have chosen to participate in ABE course(s). The two groups are similar in terms of the length of prison stay, TABE score, and racial composition. However, the involuntary dropouts are slightly older than the ABE participants and are more likely to have prior prison spells. They are also reported to have had more disciplinary problems during prior prison spells than participants, which may be related to the reason for the removal from their current facilities.⁹ They are more likely to be employed prior to their current prison spell and to also earn less when employed.

In the following section, we estimate the following four sets of ABE program impact on postrelease earnings and employment: (a) the effect of participating in ABE coursework versus not participating, (b) the effect of completing ABE coursework versus not participating, (c) the effect of participating in ABE coursework versus involuntarily dropping out within 21 days, and (d) the effect of completing ABE coursework versus involuntarily dropping out within 21 days. The first two measures will estimate the average effect of the intent-to-treat, whereas the last two measures will estimate the average effect of the treatment-on-the-treated.

Statistical Method

Our first set of estimates is based on Equation 1 that estimates the simple mean differences in postrelease outcomes between the ABE and comparison groups. As we have two ABE groups and two comparison groups, β_{11} will measure the average difference in outcomes between those who participate in (or complete) the ABE program and those who do not participate (or dropout involuntarily).

$$Y_{it} = \beta_{10} + ABE_i \beta_{11} + \varepsilon_{1it}, \quad (1)$$

where Y_{it} indicates the earnings or employment indicator for individual i in quarter t , and ABE_i is an indicator variable denoting whether individual i belonged to one of the following four groups: ABE participant versus nonparticipant, ABE participant versus involuntary dropout, ABE completer versus nonparticipant, ABE completer versus involuntary dropout; we run separate regressions for each group.

Next, in Equation 2, we estimate the difference in mean postrelease outcomes between the ABE and comparison groups, controlling for the rich set of covariates available in our data.

$$Y_{it} = \beta_{20} + ABE_i \beta_{21} + Age_{it} \beta_{22} + Educ_i \beta_{23} + X_i \beta_{24} + YRQTR_i \lambda_{21} + County_i \lambda_{22} + \varepsilon_{2it}, \quad (2)$$

where $County_i$ is a set of dummies indicating the county of most serious offense, $YRQTR_i$ is a set of dummies for the year and quarter in which Y is measured, and X_i is a set of covariates measured on prison entry, such as education (a set of dummies for years of completed schooling), age (a set of two variables containing age and age squared), predicted sentence length in months, marital status, state or region of birth, whether employed prior to incarceration, occupation of employment prior to incarceration, whether an English speaker, years in Florida prior to prison spell, cumulative years in prison prior to the target spell, number of disciplinary reports during prior prison spells, participation in nonacademic prison-based programs (substance abuse, vocational, work release, and prison industry), type of offense for the observed prison spell, and a measure of cognitive skills—that is, TABE test scores.¹⁰ The variable $County$ is included to account for differences in labor markets

⁹It is possible that prison authorities are more likely to transfer inmates who display more disciplinary problems when there is a need to move inmates. As roughly 96% of the involuntary dropouts leave their program because they are transferred to another facility, if inmates with disciplinary problems possess attributes that negatively affect their earnings and employment this may cause us to overestimate the effect of ABE programming.

¹⁰The TABE score ranges from 0 to 12.9 grade equivalent scores for our sample of inmates. The mean is 6.9 and the standard deviation is 3.2.

across counties in Florida. The underlying assumption is that inmates are mostly likely to return back to their original county of admission after release from prison. The variable *YRQTR* controls for differences in the economy across time periods as well as the change in prison or state policies that may affect earnings or employment.

Lastly, we estimate a fixed effects model in Equation 3 using the earnings and employment data during the 4 quarters prior to prison admission and 12 quarters after the forecasted release date.

$$\begin{aligned}
 Y_{it} = & \text{Relys}_{it}^k \beta_{30} \\
 & + \text{ABE}_i \\
 & \times \text{Relys}_{it}^k \delta^k \\
 & + \text{Age}_{it} \beta_{31} + (\text{PostPrison}_{it} \\
 & \times \text{SubAbuse}_i) \pi_{31} + (\text{PostPrison}_{it} \\
 & \times \text{County}_i) \pi_{32} \\
 & + \text{YRQTR}_i \lambda_{31} \alpha_i + \varepsilon_{3it},
 \end{aligned} \tag{3}$$

where $k = 1, 2, 3$.

In Equation 3, a time-invariant fixed effect for each individual is captured in α_i . The variable Relys_{it}^k is a set of three indicator variables denoting whether quarter t is k years after individual i 's forecasted release date. The interaction term between ABE_i and Relys_{it}^k captures the difference in outcomes during postrelease years for ABE participants (or completers) and nonparticipants (or involuntary dropouts). In Equation 3, δ^k is effectively a difference-in-differences estimator as it estimates the average change in Y from the pre- to the postprison quarters for ABE group members relative to the pre- to the postprison change in Y for the comparison group members. The variable PostPrison_{it} represents a dummy variable indicating whether quarter t is after individual i 's forecasted release date, and SubAbuse_i indicates whether individual i was identified in the prison records as a substance abuser at the time of prison entry. We interact PostPrison_{it} with the covariates SubAbuse and County to allow for these covariates to have different effects on Y during the pre- and postprison periods. We include these interactions to account for benefits that may accrue from participating in substance abuse programs as well as from returning to a community that has more economic opportunities, assuming that individuals return to their incoming county.

Standard errors in all three equations account for the dependence of the errors within people across time using the cluster command in STATA. To account for the possibility of differential effects by race, we estimate separate models for White and non-Whites (minorities).

Results

In Table 2, we report quarterly earnings and employment results based on Equations 1 and 2 using the two comparison groups. First, when compared against ABE nonparticipants, ABE participants have lower average quarterly earnings during the 3 years following release.

Once we control for all observed differences between ABE participants and nonparticipants, as is described in Equation 2, the negative estimates associated with ABE participation decreases for minorities and reappears for Whites. These effects are statistically significant. Interestingly, however, when ABE participants are compared with ABE involuntary dropouts, we find that ABE participants have higher earnings during the postrelease years but that the positive effect of ABE participation disappears when we control for observed characteristics.

Second, we find similar patterns for ABE completers and the nonparticipants, where only minority completers are found to have lower earnings during postrelease years. The negative effect increases for minorities when observed differences are controlled for. However, when ABE completers are compared with the involuntary dropouts, we find that both White and minority completers earn statistically significantly more than involuntary dropouts during postrelease years. These positive effects disappear when observed differences are accounted for.

Results of postrelease employment are similar to the results of postrelease earnings. Controlling for all observed characteristics, both minority ABE participants and completers are less likely to be employed than minority nonparticipants, and the direction of the effect does not change once observed characteristics are controlled for. However, when compared against involuntary dropouts, we find that both ABE participants and completers have higher postrelease employment rates. The results change when we control for observed characteristics—the positive effects no longer exist.

In sum, controlling for observed differences across inmates, we do not find any evidence suggesting that ABE participation or completion is effective in increasing one's quarterly earnings or employment probability following prison release. However, the overall negative or null effect of ABE course taking may be because of time-invariant unobserved differences—such as motivation or social skills that are correlated with earnings and employment—between the ABE groups and the two comparison groups. We address such concerns in Equation 3.

In Table 3, estimates from the fixed effect model are reported. The fixed effect estimates tell us that changes in earnings between the pre- and postprison periods are statistically significantly lower for both ABE participants and completers relative to the changes in earnings over this period for nonparticipants. In addition, the negative effects of ABE programming are heavily concentrated on minority inmates than for Whites. However, the results change quite drastically when ABE participants and completers are compared with involuntary dropouts. Estimates of δ^1 , δ^2 , and δ^3 are mostly positive, and for minority participants the positive effect is statistically significant. The results suggest that, controlling for unobserved time-invariant differences as well as for one's initial selection into an ABE course, ABE participants are earning slightly more (about US\$150 per quarter) than involuntary dropouts during the second year following prison release. Interestingly, however, none of the estimates for ABE completion on earnings are statistically significant.

In terms of employment rates, we find a positive effect of ABE participation for both Whites and minorities compared with nonparticipants. Specifically, using the pooled baseline preprison employment rates by White/minority status, this translates into about 11% relative increase in quarterly employment rates for Whites and about 16% increase for minorities.¹¹ The effect is larger when ABE completers are compared with nonparticipants. We find even greater positive effects of ABE when we implement the second comparison group, involuntary dropouts. Although estimates for Whites were not precise partly because of the small sample size of White men in the involuntary dropout group, we find that ABE participants and completers have higher pre- to postemployment- level change than involuntary dropouts by 4 to 6 percentage points. This translates into almost a 25% increase in employment levels for ABE participants and completers.¹²

One interpretation of the increased effect of ABE as we control for unobserved individual fixed characteristics is that participation in ABE programs is associated with a negative selection process. That is, inmates participating in ABE programs may have an unobserved propensity to perform more poorly in the labor market than others who do not participate in ABE. Failure to control for such differences would lead to an underestimation of the true ABE– employment relationship. This notion is also confirmed by the fact that the ABE effect estimates increase when using involuntary dropouts as opposed to nonparticipants as the comparison group. To better understand the sensitivity of our estimates, we estimate the effect of ABE participation for various subgroups in the following section.

Sensitivity Analysis

Using information available in the Florida administrative data, we construct various subgroups of ABE participants to explore whether the overall results thus far mask different ABE effects for different subgroups. On the basis of our findings in the previous section that participants and completers have similar labor market consequences, we will only present results for ABE participants. In Table 4, we present information on the intensity of ABE participation, the course-taking patterns of ABE participants, and the facility movement for ABE participants. We find that there is substantial variation in the number of class days across ABE participants. The median inmate participating in ABE programs attends about 143 days of classes. The average is about 208 days with a standard deviation of 214 days. Given this large variation in the actual number of ABE days each inmate receives and given that limited ABE exposure is likely to alter labor market outcomes, we examine the ABE– labor market relationships separately for inmates who took at least the median number of ABE days (143).

Table 4 also presents information on the number of separate ABE spells (column 2) and the number of different facilities in which we see ABE coursework taking place during an inmate's prison spell (column 3). When inmates are moved across facilities, they necessarily experience a change in their ABE coursework as these programs are provided at the prison level. These estimates speak at least partially to the quality of ABE programming that an

¹¹The preprison quarterly employment rates of White ABE participants are about 27%, whereas it is about 19% for minorities.

¹²The average preprison quarterly employment rates of ABE participants are 24.4%, and it is 24.9% for ABE completers.

inmate receives because it is not difficult to assume that education is most effective when it is regular and provided without frequent interruptions to the program of instruction. We find that an average ABE participant enrolled in 2.7 different classes during any single prison spell and stayed in about 1.3 facilities during the time he is taking the ABE classes. Termination from ABE coursework could result from one of several reasons, including changes to an inmate's security level, medical condition or psychological grade, because of disciplinary actions, because an inmate voluntarily interrupts program participation, or because an inmate completed a program cycle. For any cause except program completion, it is likely that an interruption to ABE programming results in a decrease in the effectiveness of the program's ability to positively affect the literacy and numeracy levels of participants.

In Table 5, we present the results from sensitivity analyses based on Equation 3. In the sensitivity analyses, we only report the effects of ABE participation (δ s) using the second comparison group, ABE involuntary dropouts. In the first row of Table 5, we report estimates on the effect of ABE participation, identical to those reported in Table 3 for ease of comparison. Let us first examine the relationship of ABE course participation to pre- and postquarterly earnings gains in column 1 of Table 5. In the second panel, estimates on the effect of ABE participation for inmates who receive instruction for 143 days or longer are reported. We find that the differential in pre- and postquarterly earnings is more negative for inmates taking 143 days or more of ABE classes. This finding is interesting because it contradicts our earlier hypothesis that longer ABE course instruction is beneficial for increasing postrelease earnings. It seems to support the idea that inmates receiving ABE instruction are people who are least likely to succeed in the legitimate labor market, and hence there is a negative selection process involved in who actually receives ABE classes and for how long. Given that we are controlling for individual-level fixed characteristics, the negative selection process must be based on an unobserved trait that is time variant, such as health deterioration— For example, an inmate who becomes ill may have to enroll in ABE longer due to frequent disruptions.

The third and fourth panels show estimates of the effect of receiving ABE instruction in one facility or in one course, respectively, on inmates' postrelease quarterly earnings compared with involuntary dropouts. We find the effect of ABE participation to be much larger for these inmates when compared against the average effect of ABE participation reported in the first row of Table 5. This indicates that inmates who experience the least disruption in ABE course taking reap the largest benefits.

In the fifth and sixth panels, we estimate the effect of taking ABE courses in conjunction with the receipt of other prison-based services. ABE participants who also take GED courses have substantially higher pre- and postrelease earnings differential than involuntary dropouts. The magnitude of the effect is almost 50% larger than the average effect of ABE participation. However, ABE participants who receive substance abuse treatment or vocational training do not display such strong positive effects.

Next, in column 2 of Table 5, we find that these results are consistent for postrelease employment rates as well. As is presented in the first row of Table 5, taking ABE courses was shown to be significantly effective in increasing postrelease employment rates. In the

second row, we find that taking ABE courses for a longer time period makes little difference in the magnitude of the positive effect on employment outcomes. We find that inmates who receive ABE courses in one facility without interruption have significantly higher differential in pre- and postquarterly employment rates than the average inmate who is moved 1.3 times across facilities. Their employment gains range from 1 to 2 percentage points compared to the average ABE participant. Interestingly, however, receiving ABE training in one course is not associated with particularly larger employment gains. This may partly be due to the fact that movement in ABE classrooms within facilities is more likely to address the mismatch between inmate skill and current course level rather than external institutional needs. As a result, inmates observed to be taking more than one course within a facility may be switching courses to better fit their individual needs. It is also likely that inmates with greater motivation tend to enroll themselves in multiple courses. ABE participants who receive other services, especially GED training (and less so for substance abuse treatment or vocational training), are also estimated to have higher differential in pre- and postquarterly employment levels than the average inmate who takes ABE courses. In addition to the models presented in Table 5, we examined the relationship between days of ABE participation and pre- and postprison changes in earnings and employment. In the models we estimated, ABE days were entered as a quadratic. We did not find any statistically significant effect.

Effects on Recidivism?

Although the objective of this article is to examine the effects of prison-based ABE on the postrelease labor market outcomes of male inmates, we include an analysis of whether ABE-related earnings and employment gains are related to changes in recidivism. Results from this exercise will be informative, given the emphasis on the rate of return to prison as an outcome variable of interest in studies evaluating prison-based programming (Aos et al., 2006; Gordon & Weldon, 2003; Jensen & Reed, 2006; Nuttall et al., 2003). We estimate the discrete-time hazard rate of returning back to prison within 3 years of release from prison for ABE participants and the preferred comparison group, involuntary dropouts, using logistic regression.¹³ We define recidivism as any return to prison observed in the administrative data as a return to prison.

To estimate a discrete-time event history model, the data are converted into an inmate–quarter data set during postrelease years where each individual record is converted into a number of inmate–quarter observations. Recidivism is indicated by a binary variable that equals 1 in the quarter that the inmate returns back to prison and 0 for all earlier quarters. To account for duration dependence, robust standard errors clustered on the inmate are used.

Estimates on the hazard rate of returning back to prison within 3 years by race are reported in Table 6. In a given quarter, the odds of returning back to prison of ABE participants are not statistically significantly different from those who involuntarily dropout of the program for both Whites and minorities. The odds of returning to prison, however, are lower for

¹³We control for age, education level, sentence length, marital status, state or region of birth, employment status and occupation prior to incarceration, English fluency, years in Florida prior to prison spell, birthplace, cumulative years in prison prior to target spell, participation in other prison-based programs, type of offense, and TABE test scores.

inmates with higher education levels, higher TABE scores, and those who are employed prior to their current prison incarceration. Among the various prison-based programs, participating in vocational programs appears to be effective only for minorities, whereas the work release program is found to have positive effects in reducing recidivism for both Whites and minorities (Berk, 2007). Specifically, on average, for inmates participating in the work release program the odds of returning to prison within 3 years are only 0.74 times as high as the odds of returning to prison for nonparticipants. Interestingly, we do not find any statistically significant effect of marital status, offense type, and/or sentence length. On the basis of these findings, we conclude that inmates who receive high-quality ABE during their prison stay will experience an increase in their postrelease earnings and employment rates but no significant decrease in their recidivism rates.

Conclusion

Is participation in prison-based ABE associated with better postrelease labor market outcomes? The answer critically depends on which comparison group we use to estimate the effect of ABE training. The results suggest that people selecting into ABE classes are more disadvantaged in terms of labor market earnings than people who do not participate in the program. Participation in the program or completion of the program does not appear to eliminate this relative disadvantage. However, as we explain above, we prefer using a comparison group that allows us to control for unobserved heterogeneity in the decision to participate in ABE, something that cannot be accomplished by using a comparison group composed of simply nonparticipants. When using the preferred comparison group, involuntary dropouts from ABE, we find that participation in ABE increases both postrelease earnings and employment rates. It is possible that the receipt of ABE is associated with longer working hours or a higher paying job for individuals who select into the program. We also examine the effect of completing ABE course(s) on postrelease outcomes and find statistically insignificant positive effects for earnings and significant positive effects for employment rates.

In the sensitivity analysis, we find inmates taking ABE classes experienced higher earnings and employment rates, especially when they participate in the program without interruption in one facility and when they enroll in other prison-based programs, especially the GED. Despite our findings of a positive effect on postrelease earnings and employment, we do not find any evidence supporting claims that participating in ABE classes reduce recidivism. This is quite surprising given the abundance of research documenting a positive relationship between improved labor market outcomes and reduced recidivism (Needels, 1996; Sampson & Laub, 1993; Uggen & Thompson, 2003). It may be that marginal increases in the opportunity costs of crime are not enough to entice an individual to leave crime, especially if the individual is deeply embedded in a life of crime (Bushway, 2003). A reduction in recidivism may require a fundamental change in how inmates evaluate the consequences of their actions, which is a process that will not necessarily be initiated with increased cognitive skills.

It is important to account for unobserved heterogeneity across individuals in evaluating a program that serves such a disadvantaged population. The estimated ABE–labor market

relationship was markedly different between Equations 2 and 3, indicating that the unobserved fixed characteristics of ABE participants were negatively correlated with earnings and employment outcomes. If we had not accounted for such differences, we would have underestimated the positive association between ABE participation and postrelease employment rates. We press on this point, given the lack of studies in the field of prison-based program evaluation that take this into consideration.

This article provides evidence of a strong positive effect of prison-based ABE participation and postrelease earnings and employment rates. To better understand the magnitude of the economic effects of ABE participation from a broader context, a rough cost-benefit analysis can be performed. On a per inmate basis, an education program costs approximately US \$1,418 per year in 1999–2000 (OPPAGA, 2000). As the median inmate remains in ABE class for about 143 days (0.4 year), the median ABE program cost per participant is approximately US\$567 ($= \text{US\$1,418} \times 0.4$). However, we have found economic benefits of ABE program participation in terms of postrelease earnings and employment. Specifically, the average ABE participant is estimated to earn US\$148.8 more per quarter than the average involuntary dropout during the second year out of prison. This amounts to an earnings advantage in the second postrelease year of about US\$595 ($= \text{US\$148.8} \times 4$). Furthermore, if we account for the fact that the majority of ABE program participants receive ABE training in one facility, the earnings advantage increases quite drastically—An average ABE participant who receives ABE training in one facility earns roughly US\$1,492 ($= \text{US\$218.7} \times 4 + \text{US\$154.4} \times 4$) more during the second and third years following release from prison. As the above analysis confirms, despite the absence of any reduction in recidivism, the economic benefits of ABE program participation more than outweigh the direct costs associated with ABE program provision. The potential benefits of ABE participation may in fact be larger if there are long-term gains in earnings or if improving one's postrelease employment is associated with positive individual, familial, community, and societal outcomes (Solomon, Johnson, Travis, & McBride, 2004).

A limitation of the study is that we are not able to examine any relationships between ABE participation and long-term postrelease outcomes, given the availability of our UI earnings data. It may be the case that these positive associations dissipate over time or that different relationships appear later than the time frame we can observe. In addition, these results may not be generalizable to female inmates, to male inmates who stay in prison for a longer time period than we are able to observe, or to other states.

Acknowledgment

We wish to acknowledge the assistance of Jillian Berk in working with the Florida data and the assistance of John L. Lewis in the Florida Department of Corrections and Duane Whitfield in the Florida Education and Training Placement Information Program for assistance in constructing and providing access to the data that supported this analysis. Any errors and all interpretations reside with the authors.

Funding

The author(s) received no financial support for the research and/or authorship of this article.

References

- Aos, S.; Miller, M.; Drake, E. Evidence-based adult corrections programs: What works and what does not. Olympia: Washington State Institute for Public Policy; 2006.
- Berk, J. Does work release work?. Brown University, RI: 2007. Unpublished manuscript.
- Brewster DR, Sharp SF. Educational programs and recidivism in Oklahoma: Another look. *The Prison Journal*. 2002; 82:314–334.
- Bushway, S. Reentry and prison work programs; Paper presented at the Employment Dimensions of Reentry: Understanding the Nexus between Prisoner Reentry and Work. Urban Institute Reentry Roundtable; Washington, DC. 2003.
- Cecil DK, Drapkin DA, Mackenzie DL, Hickman LJ. The effectiveness of adult basic education and life-skills programs in reducing recidivism: A review and assessment of the research. *Journal of Correctional Education*. 2000; 51:207–226.
- Gordon HRD, Weldon B. The impact of career and technical education programs on adult offenders: Learning behind bars. *Journal of Correctional Education*. 2003; 54:200–209.
- Harer, MD. Prison education program participation and recidivism: A test of the normalization hypothesis. Washington, DC: Federal Bureau of Prisons, Office of Research and Evaluation; 1995.
- Harlow, CW. Education and correctional populations. Washington, DC: U.S. Department of Justice; 2003. (NCJ 195670).
- Heckman JJ, Lalonde RJ, Smith JA. The economics and econometrics of active labor market programs. *Handbook of Labor Economics*. 1999; 3:1865–2097.
- Jancic M. Does correctional education have an effect on recidivism? *Journal of Correctional Education*. 1998; 49(4):152–161.
- Jenkins HD, Streurer SJ, Pendry J. A post release follow-up of correctional education program completers released in 1990–1991. *Journal of Correctional Education*. 1995; 46(1):20–24.
- Jensen EL, Reed GE. Adult correctional education programs: An update on current status based on recent studies. *Journal of Offender Rehabilitation*. 2006; 44:81–98.
- MacKenzie DL. Evidence-based corrections: Identifying what works. *Crime & Delinquency*. 2000; 46:457–471.
- Needels K. Go directly to jail and do not collect? A long-term study of recidivism, employment and earnings patterns among prison releases. *Journal of Research on Crime and Delinquency*. 1996; 33:471–496.
- Nuttall J, Hollmen L, Staley EM. The effect of earning a GED on recidivism rates. *Journal of Correctional Education*. 2003; 54(3):90–94.
- Office of Program Policy Analysis and Government Accountability of the Florida State Legislature. Review of the department of corrections. Tallahassee, FL: Author; 2000 Dec. 2000. (Report 00-23).
- Ohio Department of Rehabilitation and Corrections. Evaluation of the impact of correctional education programs on recidivism. Columbus, OH: Author; 1995.
- Sampson, RJ.; Laub, JH. *Crime in the making: Pathways and turning points through life*. Cambridge, MA: Harvard University Press; 1993.
- Solomon, AL.; Johnson, KD.; Travis, J.; McBride, EC. *From prison to work: The employment dimensions of prisoner reentry*. Washington, DC: Urban Institute; 2004.
- Tyler, JH.; Kling, JR. Prison-based education and re-entry into the main-stream labor market. In: Bushway, S.; Stoll, M.; Weiman, D., editors. *Barriers to reentry? The labor market for released prisoners in post-industrial America*. New York, NY: Russell Sage Foundation Press; 2006.
- Uggen C, Thompson M. The socioeconomic determinants of Ill-Gotten Gains: Within-person changes in drug use and illegal earnings. *American Journal of Sociology*. 2003; 109:146–185.
- Walsh A. An evaluation of the effects of adult basic education on rearrest rates among probationers. *Journal of Offender Counseling, Services, and Rehabilitation*. 1985; 9:69–76.
- West, HC.; Sabol, WJ. *Prison inmates at midyear 2008—Statistical tables*. Washington, DC: Bureau of Justice Statistics, U.S. Department of Justice; 2009. (NCJ 225619).

Wilson DB, Gallagher CA, MacKenzie DL. A meta-analysis of corrections-based education, vocation, and work programs for adult offenders. *Journal of Research in Crime and Delinquency*. 2000; 37:347–368.

Biographies

Rosa Minhyo Cho is an assistant professor in the departments of Education and Public Policy at Brown University. She holds a PhD in public policy from the University of Chicago. Her recent work includes both criminal justice and immigrant research, including the examination of the impact of maternal incarceration on child outcomes and an evaluation of the effects of welfare reform on Mexican immigrants' infant mortality.

John Tyler is associate professor of education, public policy and economics at Brown University. He holds an Ed.D. from the Harvard Graduate School of Education. His research interests include examining relationships between education and the labor market, exploring school reform issues, and evaluating the impact of public policies particularly as they pertain to low skilled individuals.

Table 1

Descriptive Statistics of ABE Completers, Noncompleters, Nonparticipants, and Involuntary Dropouts

	ABE group		Comparison group	
	(1) ABE participants			
	(a) Completers	(b) Noncompleters	(2) Nonparticipants	(3) Involuntary dropouts
Demographics				
% White	41.2	31.4	44.1	35.6
% Black	52.4	62.1	51.7	57.2
% Hispanic	6.0	6.2	4.0	7.2
% Other	0.4	0.2	0.2	0
Average years of education	9.3 (1.3)	9.4 (1.3)	9.6 (1.3)	9.5 (1.3)
TABE score at prison entry	6.9 (2.9)	6.0 (2.7)	7.2 (3.4)	5.7 (2.6)
Average age at admission	24.2 (8.3)	24.6 (7.9)	30.7 (8.6)	26.7 (8.9)
Average age at release	26.0 (8.2)	25.8 (7.9)	31.8 (8.6)	28.0 (9.0)
% single	41.9	42.2	47.3	44.0
% married	8.2	8.3	12.3	9.0
% separated, divorced, or widowed	9.3	8.8	17.2	12.9
% unknown marital status	40.6	40.6	23.2	34.1
Primary offense type				
% violent crime	42.5	34.1	31.4	30.2
% property crime	37.1	36.3	34.9	42.2
% drug crime	16.9	26.0	29.0	24.3
% other crime	3.6	3.6	4.7	3.3
Prison characteristics				
% with previous prison spells	29.7	31.9	50.7	44.6
Average number of past disciplinary reports of inmates who have prior spells	3.0	4.0	2.8	5.3
Average length of prison stay in months for current spell	19.8 (9.2)	14.3 (7.6)	13.2 (8.0)	14.5 (8.5)
% who recidivate within 1 year	26.8	26.1	19.1	27.2
% who recidivate within 2 years	40.1	38.9	29.1	40.1
% who recidivate within 3 years	46.2	45.2	35.4	48.2
Prison programs				
% of hours in GED program	43.6	28.3	0	0
% of hours in substance abuse program	45.8	35.7	26.6	31.4
% of hours in vocational program	24.6	13.5	6.5	8.1
% participated in work release program	18.0	14.5	15.2	11.7
% with hours working in prison industry	3.2	2.2	2.8	3.3
Employment				
% employed 1 year prior to prison admission	51.7	48.4	55.3	53.6
Earnings 1 year prior to prison admission among the employed	2,693.7 (3,969.6)	2,591.5 (3,548.9)	3,504.6 (4,307.6)	2,244.0 (3,193.8)

	ABE group			
	(1) ABE participants		Comparison group	
	(a) Completers	(b) Noncompleters	(2) Nonparticipants	(3) Involuntary dropouts
% employed 1 year post prison release	65.6	61.2	61.8	56.9
Earnings 1 year post prison release among the employed	5,227.8 (5,768.9)	4,741.9 (5,587.9)	5,730.7 (6,103.2)	4,640.9 (5,721.5)
Total <i>n</i> of prison spells	2,299	2,968	7,810	334
Total <i>n</i> of inmates	2,267	2,905	7,666	299

Note: ABE = adult basic education; TABE = tests of adult basic education; GED = general educational development. The estimates are calculated for each observed prison spell that an inmate had during the sampling period. Inmates in the ABE participant group are high school dropouts who are observed to be taking any ABE classes, literacy classes, or cognitive life skill classes during his prison spell. Inmates in the ABE completer group are high school dropouts who complete at least one of the courses he is enrolled in. Inmates in the ABE noncompleter group are high school dropouts who do not complete any of the courses he is enrolled. Inmates in the nonparticipant group are high school dropouts who do not take any of the above-mentioned classes as well as any GED courses. Inmates in the involuntary dropout group are high school dropouts who leave the ABE course within 21 days of enrollment or less because he is reallocated to a different facility or because he leaves prison.

Table 2

Ordinary Least Square Estimates of the Effect of ABE Participation and Completion on Postrelease Quarterly Earnings and Employment—By Racial Composition

	ABE participation versus nonparticipation			ABE completion versus nonparticipation		
	All	Whites	Minorities	All	Whites	Minorities
Earnings						
Equation 1	-106.72*** (22.58)	-46.05 (39.26)	-106.27*** (27.01)	-51.63* (30.14)	33.79 (51.52)	-97.87*** (35.60)
Equation 2	-81.37*** (25.40)	-81.32* (44.32)	-69.30** (30.55)	-121.88*** (33.89)	-59.16 (58.59)	-153.08*** (39.74)
Control for observed characteristics						
No. of inmates	12,830	5,271	7,559	9,948	4,352	5,596
Employment						
Equation 1	183.83*** (58.27)	195.77* (110.79)	182.06*** (65.25)	225.07*** (61.70)	256.93** (116.0)	181.27*** (69.34)
Equation 2	107.84* (58.39)	117.15 (112.25)	81.04 (66.33)	23.19 (63.91)	35.54 (122.08)	-26.51 (71.46)
Control for observed characteristics						
No. of inmates	5,054	1,771	3,283	2,499	991	1,508
Employment						
Equation 1	-0.006 (0.006)	0.025*** (0.009)	-0.019*** (0.007)	0.004 (0.007)	0.039*** (0.012)	-0.019* (0.010)
Equation 2	-0.015** (0.006)	-0.005 (0.010)	-0.017* (0.008)	-0.029*** (0.008)	-0.005 (0.013)	-0.044*** (0.011)
Control for observed characteristics						
No. of inmates	12,830	5,271	7,559	9,948	4,352	5,596

Equation 1	0.044***	0.055*	0.039*	0.049***	0.062**	0.036*
No controls	(0.017)	(0.030)	(0.021)	(.018)	(0.030)	(0.022)
Equation 2	0.021	0.021	0.009	-0.009	-0.009	-0.025
Control for observed characteristics	(0.017)	(0.029)	(0.021)	(0.018)	(0.030)	(0.023)
No. of inmates	5,054	1,771	3,283	2,499	991	1,508

Note: Equation 1 controls for no observed characteristics. Equation 2 controls for all observed characteristics, including age, education, predicted sentence length, marital status, state or region of birth, employment and occupation prior to incarceration, native English speaker, number of years in Florida, birthplace, cumulative years in prison prior to target spell, number of disciplinary reports during prior prison spells, participation in prison-based programs (vocational, prison industry, substance abuse, work release), type of offense, TABE test scores, committing county, and year-quarter dummy variables. Standard errors clustered on individual over time are in parentheses. ABE = adult basic education; TABE = tests of adult basic education.

* $p < .10$.

** $p < .05$.

*** $p < .01$.

Table 3

Fixed Effect Estimates of the Effect of ABE Participation and Completion on Postrelease Quarterly Earnings and Employment—By Racial Composition

	ABE participation versus nonparticipation			ABE completion versus nonparticipation		
	All	Whites	Minorities	All	Whites	Minorities
Earnings						
$Re\text{f}_{it}^1$	140.71 (85.79)	429.65** (202.30)	48.38 (93.11)	73.83 (100.36)	396.14* (220.12)	-52.06 (110.30)
$Re\text{f}_{it}^2$	60.02 (88.49)	308.67 (205.85)	-0.81 (96.77)	-10.00 (103.86)	274.96 (224.43)	-108.04 (115.27)
$Re\text{f}_{it}^3$	17.22 (91.32)	226.19 (209.50)	-10.70 (100.54)	-50.47 (107.74)	193.02 (228.93)	-115.77 (120.83)
$ABE_i \times Re\text{f}_{it}^1$	-50.91** (24.06)	-79.88* (43.71)	-9.57 (27.79)	-40.63 (33.44)	-47.73 (57.05)	-18.86 (39.78)
$ABE_i \times Re\text{f}_{it}^2$	-65.39** (27.70)	-65.09 (49.15)	-47.05 (32.77)	-81.89** (38.12)	-11.50 (65.10)	-114.42** (45.31)
$ABE_i \times Re\text{f}_{it}^3$	-84.36*** (30.32)	-44.42 (52.97)	-96.38*** (36.39)	-103.35** (41.19)	3.17 (70.42)	-163.54*** (48.89)
No. of inmates	12,830	5,271	7,559	9,948	4,352	5,596
Employment						
ABE participation versus involuntary dropout						
$Re\text{f}_{it}^1$	172.27 (122.52)	399.65 (351.52)	121.10 (126.46)	-42.16 (134.82)	313.85 (418.65)	-120.08 (130.90)
$Re\text{f}_{it}^2$	-34.55 (125.63)	66.91 (349.45)	-12.50 (134.32)	-289.75** (141.92)	-66.71 (419.81)	-289.23** (145.57)
$Re\text{f}_{it}^3$	-73.92 (132.13)	58.78 (357.55)	-67.11 (142.32)	-359.61** (152.43)	-113.77 (430.08)	-372.02** (159.38)
$ABE_i \times Re\text{f}_{it}^1$	45.18 (66.15)	-40.28 (138.96)	108.97 (70.15)	35.42 (71.62)	-41.84 (145.89)	64.37 (76.87)
$ABE_i \times Re\text{f}_{it}^2$	148.80** (68.49)	167.31 (132.47)	151.69* (78.51)	108.46 (74.97)	173.98 (142.18)	50.58 (86.17)
$ABE_i \times Re\text{f}_{it}^3$	90.53 (76.41)	62.77 (144.33)	117.60 (89.03)	56.56 (82.99)	81.88 (153.98)	19.66 (96.47)
No. of inmates	5,054	1,771	3,283	2,499	991	1,508
ABE completion versus involuntary dropout						
$Re\text{f}_{it}^1$	0.110*** (0.027)	0.143*** (0.055)	0.063*** (0.010)	0.112*** (0.031)	0.171*** (0.059)	0.082** (0.037)
$Re\text{f}_{it}^2$	0.069** (0.028)	0.105* (0.056)	0.013* (0.008)	0.074** (0.032)	0.134** (0.060)	0.044 (0.038)
$Re\text{f}_{it}^3$	0.060** (0.028)	0.084 (0.057)	0.003 (0.006)	0.068** (0.033)	0.114* (0.061)	0.051 (0.039)
$ABE_i \times Re\text{f}_{it}^1$	0.030*** (0.007)	0.029** (0.013)	0.032*** (0.008)	0.039*** (0.010)	0.037*** (0.017)	0.037*** (0.013)

	ABE participation versus involuntary dropout			ABE completion versus involuntary dropout		
$ABE_i \times Refyrs_{it}^2$	0.019** (0.008)	0.022* (0.013)	0.015* (0.008)	0.021* (0.011)	0.035** (0.018)	0.006 (0.014)
$ABE_i \times Refyrs_{it}^3$	0.017** (0.008)	0.025* (0.014)	0.006 (0.007)	0.014 (0.011)	0.030 (0.018)	-0.003 (0.014)
No. of inmates	12,830	5,271	7,559	9,948	4,352	5,596
<hr/>						
$Refyrs_{it}^1$	0.096** (0.044)	0.040 (0.099)	0.095* (0.049)	0.032 (0.055)	0.060 (0.128)	0.023 (0.061)
$Refyrs_{it}^2$	0.016 (0.046)	-0.044 (0.102)	0.019 (0.051)	-0.054 (0.057)	-0.036 (0.132)	-0.056 (0.065)
$Refyrs_{it}^3$	0.021 (0.047)	-0.023 (0.107)	0.016 (0.053)	-0.052 (0.060)	-0.022 (0.137)	-0.060 (0.067)
$ABE_i \times Refyrs_{it}^1$	0.042** (0.021)	0.036 (0.039)	0.045* (0.025)	0.041* (0.022)	0.037 (0.040)	0.041 (0.027)
$ABE_i \times Refyrs_{it}^2$	0.057** (0.023)	0.060 (0.042)	0.054** (0.027)	0.048** (0.025)	0.065 (0.004)	0.036 (0.029)
$ABE_i \times Refyrs_{it}^3$	0.028 (0.025)	0.009 (0.046)	0.037 (0.029)	0.018** (0.026)	0.013 (0.047)	0.018 (0.031)
No. of inmates	5,054	1,771	3,283	2,499	991	1,508

Note: ABE = adult basic education. Equation 3 controls for unobserved individual fixed characteristics and all time-varying observed characteristics, such as age, county and postprison interaction terms, substance abuse program and postprison interaction term, and year-quarter dummy variables. Standard errors clustered on individual over time are in parentheses.

* $p < .10$.

** $p < .05$.

*** $p < .01$.

Table 4

Characteristics of ABE Course Taking for Inmates in the ABE Participant Group

	(1) Total number of days in ABE class	(2) Total number of ABE class	(3) Total number of facilities while taking ABE class
<i>M</i>	208.06	2.68	1.31
<i>SD</i>	214.20	2.21	0.61
5%	11	1	1
25%	71	1	1
50%	143	2	1
75%	276	3	1
95%	617	7	3
No. of prison spell with positive value	5,267	4,874 ^a	4,874 ^a

Note: ABE = adult basic education.

^aWe were not able to match information on class enrollment and facility for 393 inmates in the ABE group.

Table 5

Sensitivity Analysis of the Effect of ABE participation on Postrelease Quarterly Earnings and Employment—Fixed Effect Estimates

	Variables	Comparison group: Involuntary dropouts	
		(1) Earnings	(2) Employment rate
1. ABE participant	$ABE_i \times Relyrs_{it}^1$	45.18 (66.15)	0.042 ** (0.021)
	$ABE_i \times Relyrs_{it}^2$	148.80 ** (68.49)	0.057 ** (0.023)
	$ABE_i \times Relyrs_{it}^3$	90.53 (76.41)	0.028 (0.025)
No. of inmates		5,054	5,054
2. ABE participant and 143 days	$ABE_i \times Relyrs_{it}^1$	1.85 (69.41)	0.043 * (0.022)
	$ABE_i \times Relyrs_{it}^2$	109.34 (72.11)	0.057 ** (0.024)
	$ABE_i \times Relyrs_{it}^3$	67.60 (80.51)	0.030 (0.026)
No. of inmates		2,964	2,964
3. ABE participant and no of movement in facility during ABE course	$ABE_i \times Relyrs_{it}^1$	110.61 (69.65)	0.052 ** (0.022)
	$ABE_i \times Relyrs_{it}^2$	218.68 *** (72.13)	0.072 *** (0.024)
	$ABE_i \times Relyrs_{it}^3$	154.40 * (80.33)	0.044 * (0.026)
No. of inmates		3,602	3,602
4. ABE participant and one course	$ABE_i \times Relyrs_{it}^1$	99.59 (73.86)	0.037 (0.023)
	$ABE_i \times Relyrs_{it}^2$	191.24 ** (76.67)	0.052 ** (0.025)
	$ABE_i \times Relyrs_{it}^3$	126.10 (84.97)	0.026 (0.027)
No. of inmates		1,920	1,920
5. ABE participant and GED course	$ABE_i \times Relyrs_{it}^1$	133.46 * (74.44)	0.057 ** (0.023)
	$ABE_i \times Relyrs_{it}^2$	221.66 *** (77.57)	0.064 *** (0.025)
	$ABE_i \times Relyrs_{it}^3$	147.84 * (86.78)	0.021 (0.027)
No. of inmates		2,005	2,005
6. ABE participant and other nonacademic (substance abuse or vocational) courses	$ABE_i \times Relyrs_{it}^1$	55.29 (66.60)	0.045 ** (0.021)
	$ABE_i \times Relyrs_{it}^2$	167.17 ** (69.02)	0.064 *** (0.023)
	$ABE_i \times Relyrs_{it}^3$	112.70 (77.00)	0.036 (0.025)
No. of inmates		4,813	4,813

Note: ABE = adult basic education; GED = general educational development. Standard errors clustered on individual over time are in parentheses.

* $p < .10$.

** $p < .05$.

*** $p < .01$.

Table 6

Odds Ratio From Discrete-Time Event History Model on ABE Participation and the Rate of Return to Prison

Variable	Comparison group: Involuntary dropouts		
	All	White	Minority
ABE participation	0.973 (0.082)	1.070 (0.171)	0.934 (0.093)
Age	0.993 (0.021)	1.054 (0.042)	0.978 (0.027)
Age squared	0.100 (0.0003)	0.999** (0.001)	1.000 (0.004)
9 years of education	0.859*** (0.051)	0.786** (0.083)	0.866** (0.063)
10 years of education	0.842*** (0.050)	0.751** (0.084)	0.827*** (0.061)
11 years of education	0.739*** (0.050)	0.696*** (0.095)	0.705*** (0.058)
Marital status			
Single	0.966 (0.091)	0.921 (0.145)	0.988 (0.119)
Divorced, widowed, other	1.148 (0.132)	1.149 (0.205)	1.148 (0.179)
Unknown	1.153 (0.112)	1.052 (0.169)	1.197 (0.150)
Been in Florida for			
1–5 years	0.926 (0.055)	0.960 (0.105)	0.898 (0.065)
5–10 years	0.680* (0.145)	0.973 (0.259)	0.359*** (0.138)
10–20 years	1.319 (0.463)	0.318 (0.316)	2.663*** (1.009)
20–40 years	0.830 (0.390)	2.543** (0.992)	0.610 (0.329)
Data unavailable	0.779** (0.078)	0.800 (0.128)	0.758** (0.099)
Born in			
Florida	1.223*** (0.081)	1.034 (0.108)	1.207** (0.114)
Alabama/Georgia	1.136 (0.119)	1.151 (0.241)	1.056 (0.139)
New York	1.093 (0.123)	1.021 (0.176)	1.078 (0.165)
English as primary language	1.639** (0.401)	1.483 (0.907)	1.728*** (0.466)
Employed at time of arrest	0.791*** (0.037)	0.792*** (0.071)	0.834*** (0.047)
Occupation prior to current spell			
Unknown job	1.005 (0.053)	0.882 (0.089)	1.024 (0.065)
Food service job	1.223** (0.098)	0.947 (0.149)	1.293*** (0.123)
Unskilled labor job	0.915 (0.067)	0.834 (0.112)	0.946 (0.083)
Carpentry job	0.977 (0.404)	1.029 (0.481)	1.146 (1.086)
Other type of job	1.027 (0.132)	1.002 (0.200)	1.082 (0.184)
Offense type			
Violent	0.841 (0.104)	0.737 (0.141)	0.815 (0.134)
Property	1.148 (0.141)	1.207 (0.224)	1.100 (0.183)
Drug	1.102 (0.138)	1.133 (0.259)	0.976 (0.161)
Cumulative days in prison prior to current spell			
0–3 years	1.001*** (0.000)	1.001*** (0.000)	1.001*** (0.000)
3–6 years	1.000*** (0.000)	1.000 (0.000)	1.000** (0.000)

Variable	Comparison group: Involuntary dropouts		
	All	White	Minority
6–9 years	1.001 *** (0.000)	1.001 * (0.000)	1.001 *** (0.000)
9–12 years	1.000 (0.000)	1.000 (0.000)	1.000 (0.000)
Number of months in prison for current spell	1.000 (0.003)	1.008 (0.005)	0.996 (0.003)
Dummy for program participation			
Vocational	0.851 *** (0.050)	0.968 (0.098)	0.824 *** (0.062)
Substance abuse	1.015 (0.048)	1.053 (0.093)	1.021 (0.058)
Prison industry	0.771 * (0.118)	0.659 (0.193)	0.833 (0.147)
Work release	0.740 *** (0.052)	0.589 *** (0.077)	0.803 *** (0.068)
TABE test score	0.960 *** (0.008)	0.974 * (0.015)	0.970 *** (0.010)
Log likelihood	–8,980.37	–2,714.71	–6,216.54
<i>n</i> of inmate	5,030	1,766	3,264
<i>n</i> of observation	47,236	17,862	29,336
Estimated quarterly hazard rate of returning back to prison within 3 years of release for comparison group inmates	0.053		

Note: ABE = adult basic education; TABE = tests of adult basic education. Odds ratios are exponentiated logit regression coefficients, e^{β} . Numbers in parentheses are robust standard errors clustered on each inmate. Omitted categories are 8 years or less of education, married, been in Florida for 1 year or less, born in other place, all other jobs/occupation, other offense, and 0 days in prison prior to current spell. Twenty-six year-quarter dummy variables were also included in the estimation but are not reported here. Standard errors clustered on individual over time are in parentheses.

*
 $p < .10$.

**
 $p < .05$.

 $p < .01$.