

# The Effects of Postsecondary Correctional Education

## *Final Report*

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*To the memory of Laura Winterfield, our colleague, mentor, and friend*

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## Executive Summary

Over the last several decades the U.S. prison population has grown at an unprecedented rate. As this population has grown so has the interest of practitioners, policy makers, and researchers in better understanding how to prepare returning inmates for release into the community. Previous research has found that individuals who are employed after their release are less likely to recidivate (Baer et al. 2006). Increasing educational proficiency has shown promise as one strategy for assisting inmates in finding gainful employment after release and ending their involvement with the criminal justice system. The research presented in this report examines the effect of prison-based postsecondary education (PSE) on offenders both while incarcerated and after release.

Urban Institute researchers worked with the staff of four institutions in three states to conduct inmate focus groups and stakeholder interviews to explore the motivations for enrolling in PSE, the impact of PSE on offenders while incarcerated, and the expected benefits after release. A quantitative outcome evaluation was also conducted using data on PSE participants and nonparticipants drawn from three states.

Inmates and other stakeholders were enthusiastic about PSE programs offered at each of the four facilities visited by the researchers. A consistent theme across respondents and locations was that PSE has a positive impact on inmate behavior and that participating in PSE increases feelings of self-esteem. Inmates typically believed that participation in PSE would increase their employment prospects after release; however, many saw further education beyond that received in prison as necessary to reach their employment goals. Inmates reported a number of challenges to engaging in prison-based PSE; among them, the availability of quiet space to study, access to electronic resources, and lack of cooperation by correctional staff.

The analysis of postrelease recidivism yielded evidence of a consistently negative association between PSE participation and recidivism. In each of the three states, prisoners who participated in PSE were less likely to recidivate during the first year after release. The magnitude of the effect size estimates reached both substantive and statistical significance. While these findings are encouraging, they should be viewed as promising, but not conclusive, evidence of the potential of correctional PSE to improve postrelease outcomes for prisoners. Three caveats are especially salient. First, this study relied exclusively on observational data. The prisoners in the study chose to participate in PSE or not; they were not randomly assigned to the treatment and comparison conditions. Although we applied sophisticated statistical techniques in an attempt to adjust for the self selection, no amount of statistical adjustment is a perfect substitute for strong study design. Second, we were missing data on key measures for large numbers of research subjects in each state. We also made statistical adjustments to correct for the missing data problem. Third, we had no institutional level information about program type, structure, delivery of PSE in any of the three states.

## Introduction

The number of individuals incarcerated in the United States continues to rise at a staggering rate. Between 1987 and 2006 the U.S. prison population nearly tripled from 585,084 to 1,596,127; currently, one out of every 100 U.S. adults is behind bars in a local, state, or federal facility (Pew Center on the States 2008). Given that most inmates are ultimately released, it is not surprising that the issue of reentry is receiving renewed interest among policy makers and researchers alike.

Over the last several years, a team of researchers at the Urban Institute (UI) has worked to increase our understanding of the challenges faced by prisoners as they return home following a period of incarceration (Baer et al. 2006). One of the key obstacles identified by the UI researchers was the difficulty ex-offenders face in finding and maintaining postrelease employment. The majority of inmates surveyed by UI believed that having a job would help them stay out of prison; however, only one in five reported having a job waiting for them after release. While troubling, this finding was not surprising given that many inmates enter prison with significant educational deficits, which, coupled with their status as an offender, can make securing employment difficult after release.

Increasing the educational proficiency of inmates during incarceration shows promise as one way of improving their chances of finding and keeping gainful employment after release, as well as ending their involvement with the criminal justice system. In a comprehensive review of the research literature on educational, vocational, and work programs for adult offenders, Wilson, Gallagher, and MacKenzie (2000) found evidence that adult basic education (i.e., GED programs) as well as postsecondary education (PSE) program participation was positively related to postrelease employment and negatively related to future criminal activity. While encouraging, these findings were based on a relatively small number of studies of varying methodological quality. Thus, much was still unknown about the effectiveness of these programs as well as the mechanisms through which they act.

In 2005, the Lumina Foundation for Education awarded a grant to the Urban Institute to conduct an evaluation of the effect of postsecondary education on U.S. offenders and institutions. Given the Foundation's mission—to *expand access to and success in postsecondary education in the United States... [by seeking] to identify and promote practices leading to improvement in the rates of entry and success in education, particularly for students of low income or other underrepresented background*—inmates pursuing postsecondary education represent a distinct group covered by this mandate.

Because of the scarcity of information documenting the impact and functioning of prison-based PSE, the research conducted by UI on behalf of the Lumina Foundation focused on providing answers to two basic questions:

- (1) *How do offenders and stakeholders view the value of PSE programming within their facilities?*
- (2) *Does participation in PSE reduce recidivism once important differences among offenders participating and not participating in PSE are taken into account? Further, does the specific model of delivering PSE (distance, onsite) or institutional type change the effects of PSE?*

Researchers from UI adopted a ‘two-pronged’ approach in answering these questions. A qualitative analysis of inmate focus groups and stakeholder interviews was undertaken to examine perceptions of the value of PSE from multiple perspectives. And, a quantitative study of administrative data was conducted to assess the relationship between PSE participation and postrelease recidivism.

In the next section of the report, we present a brief overview of the history of postsecondary education in American corrections as well as the working definition of PSE used in this study.

## **PSE in American Corrections**

A new chapter in correctional education was ushered in with the creation of the Pell Grant program in 1972. The Pell Grant awarded federal student aid for postsecondary education based on financial need, a criterion met by most inmates. However, changing attitudes toward crime in the 1980s and early 1990s stirred debate regarding the appropriateness of higher education for inmates, leading ultimately to a provision in the Violent Crime Control Act of 1994 ending Pell eligibility for state and federal prisoners. As Erisman and Contardo (2005) noted in their study of postsecondary correctional education policy, much of the backlash was based on the erroneous assumption that prisoner access to Pell funds limited access for non-prisoners.

In 1998, Congress revisited the funding of correctional postsecondary education with the introduction of block grants under the Incarcerated Youthful Offender (IYO) program. These program funds, allocated on a year-by-year basis provided federal support for postsecondary educational and vocational training to youthful inmates (under 25) who qualified for release or parole within five years. While IYO funds represented the most commonly reported source of funding for prison based PSE (83 percent of responding states), prisoner self-funding (56 percent) and state appropriations (47 percent) also represented important sources of support (Erisman and Contardo 2005).

For the purpose of this study, the research team has defined *postsecondary education* as *coursework, either academic or vocational, for which an inmate may receive college credit that may be used toward a two-year, four-year, or graduate college degree*. As would be true for PSE outside of the prison system, our working definition referred only to coursework that was offered to inmates who hold a high school diploma or GED. Certificate programs were included only when the courses taken as part of the certificate program were provided by accredited institutions and could be transferred to, at minimum, an associate’s or applied associate’s degree.



## Selection of Research Sites

Based on the definition of PSE offered above, the research team began the task of identifying four research sites with the goal of arriving at a geographically diverse sample representing a range of instruction types and settings. Data from the Institute of Higher Education Policy’s *Prisoner Access to Post-Secondary Education Survey* (reported in Erisman and Contardo 2005) was used to identify a group of 23 states (plus the federal system) offering PSE to a typical enrollment of 500 or more inmates. We requested additional, more detailed, information from these candidate sites. As information was received from representatives of the different systems, the selection criteria were refined and the 500+ requirement was dropped.

Those systems that (1) *did not respond*, (2) *did not require a high school diploma/GED*, (3) *limited course eligibility to IYO Grant eligible inmates*,<sup>1</sup> (4) *did not allow college credit to be earned for PSE*, (5) *did not provide at least some degree focused PSE courses free of charge*, or (6) *did not meet the data systems requirements of the study*, were eliminated from the sample. Using these criteria, the pool of potential sites was narrowed to five states: Colorado, Indiana, Massachusetts, New Mexico, and Ohio. Appendix A provides a flowchart detailing the site selection process.

At this stage in the selection process, the decision was made to include all five states in the analysis rather than reduce the pool further. In part, this decision reflected the desire to maintain as much diversity across sites as possible. However, as the study got underway, one state opted out, and another had to be dropped because of difficulty in collecting the necessary educational data, thus reducing to three the number of sites available for analysis—Indiana, Massachusetts, and New Mexico. Table 1 provides basic descriptive data on the sample. Detailed descriptions of each state’s PSE programming at the time of the study are provided in Appendix B.

**Table 1. Descriptive PSE Information for Selected Study Sites**

Site	Region of U.S.	Current PSE Enrollment*	Security Level(s) of Facilities Offering PSE	# of Public Facilities	# of Private Facilities
Indiana	North Central	2700	Medium; Minimum	14	0
Massachusetts	North East	180+	Medium; Minimum	19	1
New Mexico	South Central	647	Medium; Minimum	5	2

\* 2005 estimate.

Quantitative data provided by the Indiana, Massachusetts, and New Mexico state departments of corrections were used for the quantitative analysis of the relationship between participation in prison PSE and institutional adjustment and postrelease recidivism. Three institutions, two in

<sup>1</sup> The Workplace and Community Transition Training for Incarcerated Youth Offenders program, authorized as Title X, Part E, Section 1091 of the Higher Education Act of 1965, as amended by Public Law 105-244, allows federal funds to be used to provide postsecondary education and postsecondary vocational training for youthful offenders up to age 25. Qualifying offenders must also be eligible for release or parole within five years. In order to select sites that made PSE available to a comparable range of inmates, we eliminated sites that restricted these programs to IYO eligible individuals only.

New Mexico and one in Indiana, were selected as locations for the inmate focus groups and stakeholder interviews. In order to ensure that our protocol would allow for the accurate collection of relevant qualitative data, we conducted a pilot test at a correctional facility in Virginia. While Virginia was not included in our administrative data study, the State Department of Corrections offered a facility that met our study criteria and was also within close proximity to the Urban Institute. After the pilot group, we found no need for subsequent alterations of the protocol, as the data collected more than met our expectations. Therefore, we included those findings in this report. Descriptive information on the four qualitative data collection sites is provided in Appendix C.

## What We Learned—Inmate and Staff Perceptions

Inmate focus groups and stakeholder<sup>2</sup> interviews were conducted at the Central New Mexico Correctional Facility (“the Farm”), the New Mexico Women’s Correctional Facility, the Westville Correctional Facility (Indiana), and the Coffeewood Correctional Center (Virginia).<sup>3</sup> Inmate focus groups ranged in size from 9 to 14 participants and took place in a room within each facility where inmates were afforded a reasonable degree of privacy within the procedural guidelines of the facility. Informed consent was obtained at the outset of each focus group following a verbal description of the study. Stakeholder interviews were semi-structured and held in informal settings. The interviews were arranged and scheduled by facility liaisons at each site. The research team requested interviews with the facility warden, education administrators at the facility or program level, and any other key staff, such as teachers or program facilitators. Stakeholder interviews were conducted with three to six participants at each facility.

Qualitative analytic methods were employed in order to explore the effects of PSE within the context of the participants’ perspectives and experiences. Information gained from the focus group and stakeholder interview transcripts was examined by comparing responses within and across all sites, including all participant categories. The research team used this method to identify common themes and findings, as described below.<sup>4</sup> The full set of focus group and interview questions is provided as Appendix D.

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<sup>2</sup> Stakeholders consisted of program administrators, correctional education staff, and facility staff. While every attempt was made to interview people within each stakeholder category listed above, the groups represented varied by PSE model and the availability of staff and administrators at the time of the site visit. Telephone interviews were conducted when key stakeholders were not available. Ultimately, all stakeholder categories at the facility and program levels were represented in the qualitative analysis.

<sup>3</sup> Three sites were all-male facilities (Central New Mexico Correctional Facility—*New Mexico Men’s*, Westville Correctional Facility, and Coffeewood Correctional Center; one facility (New Mexico Women’s Correctional Facility—*New Mexico Women’s*) was all-female.

<sup>4</sup> Additional detail concerning the qualitative component of the study can be found in *The Effects of Post-Secondary Correctional Education: Perceptions of Offenders and Staff* (Burke-Storer, Correa, and Winterfield 2007).

## ***Inmate Focus Groups***

### **Motivations for Postsecondary Education**

Inmates typically learned about PSE opportunities from other inmates, through conversations with the facility's educational staff, or from flyers posted at the prison. Among the most commonly reported reasons for enrolling in prison-based PSE was the desire to own and operate a business upon release. Other motivating factors mentioned during the focus groups included the desire to acquire a higher-level of education and/or skills, the low (free or grant-based) cost of the courses, and the desire to make a negative incarceration experience more positive.

### **Enrollment, Course Selection, and Education Plan**

Focus group participants were asked to describe any barriers they may have encountered during the enrollment process or while registering for specific courses. Problems during the enrollment process were limited in number. Some subjects in Virginia described not meeting the requirements of the IYO Grants as a barrier, while others mentioned the rejection of their Free Application for Federal Student Aid (FAFSA) by the participating college as an issue. Participants from the New Mexico Women's and Indiana focus groups identified limited communication with the college as a difficulty. Additionally, inmates at the New Mexico Men's facility described problems with verifying high school diplomas and transfers within the system interfering with meeting enrollment deadlines as issues they faced.

Subjects at three of the four sites (Virginia, New Mexico Men's, and Indiana) reported that core coursework was not offered every semester, slowing their progress toward degree completion; respondents at the New Mexico Women's facility described classes as being unavailable or full. Respondents also mentioned limitations on the number of courses that could be taken during a semester (New Mexico Women's) and difficulty in meeting with academic advisors (Indiana) as problems. Despite encountering these problems, focus group participants reported taking an average of two courses per semester.

All focus group participants reported that they were working toward a formal degree. Across all of the sites, a number of respondents expressed the goal of completing a degree prior to their release into the community. However, several explained that the degree(s) offered at their institution were not their ultimate goal, but that the degree or coursework completed prior to release would be applied to a future degree. Impressively, a few of the respondents from both New Mexico focus groups and the Virginia facility indicated that they had already earned one degree and were currently working on a second degree through the same program.

### **Perceived Helpfulness of Coursework and Usefulness of Acquired Skills**

Participants in the Virginia, Indiana, and New Mexico Men's focus groups found PSE courses in general to be helpful, interesting, and valuable. Respondents from both New Mexico facilities, as well as the Indiana facility, singled out business courses as especially helpful, while individuals from the Indiana facility mentioned health/wellness and communications courses. Virginia focus group members viewed computer and humanities (including social and behavioral science) courses as helpful. When asked about specific skills gained through their PSE coursework, responses varied by site; however, computer skills, typing, and writing were among the most commonly mentioned

## **Effect of PSE on Self-Esteem, Future Outlook, and Attitude toward Incarceration**

At all study sites, focus group discussions were dominated by reports of how PSE had affected students sense of self. Participants at all sites indicated that PSE had positively affected their self-esteem. Among the most common examples offered were ‘learning that they could complete something’ (both New Mexico sites and Indiana), ‘learning that they are more intelligent than they had previously believed’ (both New Mexico sites), ‘pride in being the first in their family to graduate from college’ (Virginia and Indiana), and ‘having a renewed sense of confidence’ (both New Mexico sites). Similarly, the topic of PSE’s effect on the way participants looked toward the future stimulated enthusiastic discussions. The most commonly provided examples included ‘anticipation of returning to the community more accomplished and able to establish credibility after previous mistakes’ (Virginia and both New Mexico sites), ‘more positive outlook because of supportive associations with other PSE inmates’ (Virginia and both New Mexico sites), ‘feeling able to set a good example in the community’ (New Mexico Women’s and Indiana), ‘having a new ability to plan for the future and set goals’ (Virginia and Indiana), and ‘the belief that without PSE they would have envisioned themselves returning to prison at a future date’ (New Mexico Men’s and Indiana).

Many participants referenced their motivation for enrollment when describing the effect of PSE on their futures. Individual responses included feelings of preparedness to take over a business, understanding the legal aspects in running an existing business, ability to be hired for a better job in which they could invest in their futures, being able to do more than menial labor upon release, and general feelings that the PSE experience alone would strengthen their success outcomes once they returned to society, regardless of what courses were taken or the type of degree that was obtained.

Respondents reported that PSE had a significant effect on their actions and thoughts while incarcerated. Participants across all sites reported that the desire to stay in PSE motivated them to avoid prison conflicts. Inmates in the Virginia and New Mexico Men’s facilities explained that graduating or staying in the program became more important than the need to defend oneself or become involved in prison disputes. Further, respondents from three sites (both New Mexico facilities and Indiana) stated that PSE overshadowed the fact that they were incarcerated and kept them from thinking about ‘doing time.’ Subjects in half of the sites (New Mexico Men’s and Virginia) reported that their attitude changed from negative to positive as a result of PSE, and subjects in the other two sites (New Mexico Women’s and Indiana) reported that PSE helped them to focus and set goals while incarcerated.

### **PSE-Related Employment Goals and Perceived Preparedness**

Focus group participants expressed varied responses when asked whether they planned to seek work relating to their coursework upon release. Participants in half of the sites (New Mexico Men’s and Indiana) stated that they did have plans to seek work related to their degree and/or coursework; one respondent from the New Mexico Men’s group stated that he was already researching job postings in anticipation of his release. When asked if they felt prepared to seek work in their chosen field of study (or type of work for which PSE provided related knowledge), only inmates in the Virginia group reported feeling prepared. Inmates in the remaining sites expressed that the completed coursework was helpful but that what was offered in prison was not

enough to qualify them for the type of work they were seeking and that additional coursework would be necessary to obtain such positions. Regardless of their feelings about initial employment, participants across all four focus groups expressed that they would need further education in order to accomplish their longer-term career goals.

### **Problems, Suggested Changes, and Advice to Other Inmates**

Focus group participants at three of the four institutions (both New Mexico sites and Indiana) noted the choice between PSE courses and higher paying work assignments as a potential barrier to coursework completion. Participants in the Virginia facility described lack of internet access, limited computer access, cost of textbooks, and limited availability of quiet study space as problem they faced. Interestingly, respondents at three of the four facilities (Virginia, Indiana, and New Mexico Men's) identified a lack of support or cooperation from the correctional officers as a barrier. Respondents at all of these sites described insults and negative comments from officers, even speculating that the officers were attempting to bait them into arguments. These experiences stand in contrast to comments made by other inmates at all four institutions in which they expressed gratitude for the support they received from educational program staff.

Suggestions for changes to improve current PSE programs varied across sites. A quiet place to study often surfaced in discussions, with Virginia focus group participants expressing a desire for a student-only dorm, the designation of a college student-only computer lab, and more study hall time for working students (this last wish was shared by inmates in both New Mexico facilities). Inmates in the New Mexico Men's and Virginia facilities recommended additional computer access for the purpose of completing coursework, with the New Mexico inmates suggesting that one computer be installed in each dorm or pod for students to share in the evenings. Focus group participants at the two sites that did not use one-way internet (Virginia and Indiana) suggested allowing restricted internet access in order to provide online computer courses and supplemental research materials, as well to help develop a general knowledge of the internet. Inmates in three facilities (Virginia and both New Mexico groups) recommended implementing or increasing 1good time1 points or 'time-cut' conduct awards for PSE (some time cuts are available at the New Mexico facilities).<sup>5</sup>

Participants across all sites reported that they would encourage other inmates to enroll in PSE. Respondents from three of the four sites speculated that funding for PSE courses would not be as easily accessible in the outside world as it was in their current facility. And, participants from three of the four sites also stressed that an inmate's future opportunities, including employment, were much better if they took advantage of PSE.<sup>6</sup>

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<sup>5</sup> Additional changes mentioned included: *allowing students to attend classes during lockdowns, increasing variety of courses and programs, larger course loads, faster enrollment process, start of PSE earlier in an inmate's sentence, additional night classes, increased communication between inmates and educational personnel, designation of PSE as an inmate's job (Virginia has this policy), and events for PSE inmates apart from graduation.*

<sup>6</sup> Additional advice mentioned included: *'PSE is a way to use incarceration time wisely'; 'you will have more time to adapt to college and focus on studies while in prison than you will when released'; 'college may be intimidating, and inmates don't want another failure. But once [they] start, self esteem and motivation will rise'; 'working [while incarcerated] is not better for you than PSE', you need to stay marketable; society has changed, and you will be older when you get out'; and 'the personal support you will receive is strong, even compared to [a] standard higher learning institution'.*

## **Stakeholder Interviews**

For the purpose of the analysis, we divided the stakeholders into two categories: (1) Education Program-Level Stakeholders, and (2) Facility-Level Stakeholders (Non-Education). However, it should be noted that these categories are not mutually exclusive, as some education staff represented both the facility and the education program levels. This was especially true in the case of education staff who were facility employees and represented the overall education programs in their facilities but were not particularly focused on PSE programming. Some PSE-specific staff worked out of the facility that they represented, but reported to other levels of the Department of Corrections (i.e., New Mexico) or the outside PSE service provider (i.e., Indiana). A clear breakdown of facility-level versus education-level or outside service provider was difficult, as some education provider representatives worked primarily out of the facilities (i.e., Purdue University facilitator, Project POWER staff in New Mexico).

The results provided below highlight findings from the discussion of program goals, program use, benefits, accomplishments, and challenges.

### **Education Program-Level Stakeholders**

#### **Program Goals**

Responses obtained from the discussion of program goals were examined by the research team in terms of *goals for inmates* and *goals for society*. Overall, the most common goal reported was from the ‘goals for inmates’ category—to provide inmates with more choices or options for employment or further education upon release. This response came from four stakeholders across three of the four sites. At least one education-level stakeholder at three of the four sites reported *reducing recidivism* or *facilitating a smoother transition into society as productive citizens* as a society-related goal. Other commonly reported goals were inmate-related and included: (1) to increase inmates' interest in and awareness of the importance of education, (2) to familiarize offenders with a college setting; and (3) to increase inmates' skills. These responses were obtained from at least one education program level stakeholder at two of the four sites. No discrepancies were found among responses for program goals for education program stakeholders within individual facilities or across facilities.

#### **Program Utilization**

When asked about enrollment in general, a few education-level stakeholders across all sites reported that inmates are initially motivated to enroll/engage in PSE due to the “time-cut” or reduced sentence incentive, although interest in the coursework itself emerges once students begin classes. Others reported that a satisfactory percentage of inmates are taking advantage of PSE course availability and that the classes are full. Stakeholders in the New Mexico Women’s facility added that they perceive that inmates who have at least a 10th grade level of education are typically interested in furthering their education, and that there is a waiting list for the program. Moreover, they stated that the student dropout level is low. Stakeholders in the New Mexico Men’s facility reported that, in general, inmates who don't work are motivated to meet minimum PSE requirements, although not all inmates who are interested in PSE qualify for the program. Not all sites were in agreement regarding use, however, in Virginia both key education and facility staff felt that not enough inmates enroll in PSE courses.

Stakeholders were also asked to discuss whether they had noted any differences in the inmates who enroll in PSE as compared to the general population of inmates. This question revealed different perceptions across and within facilities. Stakeholders in Virginia offered several observed differences, including: (1) inmates likely to enroll are more motivated, mature, and goal-driven than others, and (2) many IYO Grant recipients are less mature than other PSE student inmates. Stakeholders at the Indiana site disagreed on whether or not there were differences between PSE and non-PSE enrolled inmates. While some reported that there was no notable difference in students enrolling for PSE (other than interest in PSE/college degree), others reported that most PSE students are in for lesser offenses than the general population, and that the PSE students are not discipline problems. One stakeholder offered the explanation that PSE students are different from other inmates in that they must successfully complete a thorough screening process, including individual conduct reviews and face-to-face interviews. In this particular program, this may in turn result in a student body with less of a history of conduct issues and a higher level of education. Another added that PSE students are the type that should be diverted rather than incarcerated, due to having committed lesser offenses.

Stakeholders from the New Mexico Women's facility also provided several perspectives, including that those who enroll in PSE differ only by their strong consideration of education as important, although those who do not qualify for the funded program often pursue self-paid coursework on their own. Another speculated that inmates who enroll vary in terms of age, with the average student being somewhat younger (under 35) than the general population at that facility. Stakeholders in the New Mexico Men's facility reported that many PSE student inmates have taken courses at other correctional facilities.

### **Program Benefits**

The most common long-term benefit to inmates reported was that perceived success and/or accomplishments in PSE positively changes inmates' self-concept and increases pride, often because many did poorly in school prior to incarceration. This response was common among all sites and was repeated frequently at several sites. The most common benefit to the facilities reported across sites was that PSE students have fewer conduct issues, and the PSE program is subsequently seen as positively affecting inmate behavior and creating a safer prison environment. The second most common response regarding benefit to inmates was that the skills gained from PSE increases inmates' abilities to obtain gainful employment and to pursue other endeavors after release, and that PSE improves inmates' self-esteem overall. Each of these perspectives was offered at three of four study sites.

Finally, the college graduation ceremony was seen as a benefit (meaningful to the inmates) by stakeholders at two sites, as was PSE students being 'looked up to' and serving as role models for other inmates. Other cross-site responses included: (1) time cuts (sentence reductions) as beneficial to the inmates, (2) PSE makes incarcerated time go by faster, (3) the ability to take college courses/earn a degree is a major benefit/accomplishment for an inmate, (4) PSE students can become tutors for other programs or facilitators (paid by the DOC), and (5) PSE fosters interest and continuation in future higher education.

## **Program Challenges**

Few patterns were found in the identification of challenges to PSE programs, with the exception of the following: (1) staff at two of four sites reported that some student cheating problems had been identified, (2) science courses (such as biology or chemistry) were limited because of lab restrictions, (3) some students lacked the necessary computer and/or keyboarding skills to engage in PSE, and (4) correctional staff are resentful of the PSE opportunity given to inmates and may intentionally undermine students.

## **Facility Level Stakeholders (Non-Education)**

The most common reports for this group revolved around the discussion of PSE program benefits. As highlighted above, the most common finding among stakeholders was that involvement in PSE positively affects inmate behavior and creates a safer prison environment. Three out of the four individuals in the facility stakeholder group further explained that PSE students have fewer conduct issues, which in turn eases the job of facility staff. Other common reports from this group included the belief that PSE reduces recidivism and that PSE gives inmates hope, goals, or something to aspire to. No common themes or discrepancies were found for this group in the discussion of program goals or program use.

## **What We Learned—Analysis of Administrative Data**

We acquired observational data (i.e., administrative records) from one or more criminal justice agencies in each of three states—Indiana, Massachusetts, and New Mexico—with qualifying prison PSE programs. In each state, we defined a cohort period of two or more years, identified all of the persons released from prison during that timeframe, and coded their in-state recidivism behavior during the first year following their release. In Indiana, we defined recidivism as return to prison for any reason, including technical violation. In Massachusetts and New Mexico, we defined recidivism as new arrest either for a new offense or technical violation.

In all three states, we identified 100 to 400 treatment subjects who received some PSE during their incarceration. We contrasted the postrelease experience of the treatment subjects with subjects who entered prison with a high school diploma or equivalency but did not receive PSE while incarcerated. These non-PSE comparison subjects met the educational prerequisites to participate in PSE but did not do so. The release cohorts we examined in each state included at least 1,000 subjects in the comparison condition.

Due to the limitations of the data we were able to assemble from each state, the specific conditions occupied by the treatment and comparison subjects differed across the three states. In addition, we were unable to obtain criminal history data for the Indiana subjects, which limited the list of independent variables available for that one state. We also confronted missing data challenges in each state. We were missing data on the educational attainment of substantial numbers of our subjects in Indiana and Massachusetts. We were also missing criminal histories for lesser numbers of subjects in New Mexico and Massachusetts. Finally, since our goal was to draw causal inferences about the effect of in-prison PSE on recidivism using observational data, we had to address the selection bias that is often present in data when subjects are not randomly assigned to study conditions as part of a formal study design. Prisoners who choose to participate



in PSE while in prison, or are allowed to do so by prison officials, are likely to differ from other prisoners who do not participate in PSE in other ways that may affect their risk of recidivism.

The procedures used to correct for the missing data and nonrandom selection into PSE and non-PSE groups are described in detail in Appendix E. This appendix also describes the characteristics of those groups of individuals (PSE and non-PSE) included in the analysis samples for each state as well as the success of propensity score weighting in balancing the groups for analysis.

## Results of the Analysis

Table 2 provides estimates of success and failure rates for non-PSE and PSE participants for each state sample. The data presented in the table have been weighted to adjust for both selection bias and missing data; the reduced sample sizes (effective sample size or ESS; shown in brackets) reflect the weighting procedure (see Appendix E for further detail).

We had hypothesized that participating in PSE while in prison would reduce recidivism regardless of whether recidivism was measured as a new arrest (as in Massachusetts and New Mexico) or as a return to prison (as in Indiana). After weighting, the success and failure rates for each state show that those who participated in PSE had a lower recidivism rate than those who did not.

**Table 2. Comparison of Weighted Recidivism Rate for Non-PSE and PSE Participants**

State	Measure	Outcome	Non-PSE	PSE
Indiana	Returned to prison <sup>a</sup>	No	94.71% (1021)	97.56% (320)
		Yes	5.29% (57)	2.44% (8)
Massachusetts	New arrest <sup>a</sup>	No	70.27% (130)	84.21% (112)
		Yes	29.73% (55)	15.79% (21)
New Mexico	New arrest <sup>a</sup>	No	55.08% (732)	60.62% (214)
		Yes	44.92% (597)	39.38% (139)

<sup>a</sup> Within one year of release.

We next estimated a series of logistic regression models to estimate the impact of PSE participation on recidivism while also controlling for any background risk factors that may not have been fully accounted for in the missing data and selection bias adjustments (See Appendix F for further detail). The results of these analyses are presented in Table 3. The reduction in recidivism risk attributable to PSE for Indiana (–3.40 percent) and Massachusetts (–14.19 percent) were similar to those shown in the simple group comparison (Indiana: –2.85 percent; Massachusetts: –13.94 percent). The impact of PSE on recidivism for the New Mexico sample was much stronger (–24.61 percent) than the difference between the PSE and non-PSE groups shown in Table 2 (New Mexico: –5.54 percent). The difference in results suggests that key differences in recidivism risk (excepting PSE or non-PSE status) remained despite attempts to balance the groups. The logistic regression was able to further control for these differences.

**Table 3. Predicted Reduction in Probability of Recidivism for PSE Participation**

State	Measure	Coefficient <sup>a</sup>	Change in Risk <sup>b</sup> (%)
Indiana	Returned to prison	-.77 <sup>†</sup>	-3.40
Massachusetts	New arrest	-.78*	-14.19
New Mexico	New arrest	-1.00*	-24.61

\*  $p < .05$ ; †  $p < .10$

<sup>a</sup> Logged odds ratio coefficient from logistic regression (See Appendix F).

<sup>b</sup> Expected change in risk for individuals who share the characteristics of the PSE group. This is referred to more technically as the treatment effect on the treated.

## Summary of Findings

### **Qualitative Results**

Overall, both inmates and stakeholders were very positive and enthusiastic about the PSE programs offered at all four facilities visited. Inmates expressed a great deal of gratitude toward the efforts of education staff, as well as recognition of and appreciation for the challenges that staff often encountered in the coordination and administration of the programs. Several inmates indicated that the program staff within their facility went above and beyond any expectation they may have had. These statements were repeated in interviews with program staff, who generally considered the programs important and were happy to put in the extra effort required to keep them running.

The most common report across all stakeholder groups at all facilities was that involvement in PSE affects inmate behavior and creates a safer prison environment. PSE students recognized the privilege of being enrolled in these courses, and reported being careful to avoid situations that could result in disciplinary infractions and subsequently jeopardize their continued participation.

Stakeholders at the facility level commonly reported that the PSE program goal is to reduce recidivism, and also reported that recidivism is in fact reduced as a result of these programs. Several inmates also speculated that their future criminal behavior would be interrupted by the PSE they were receiving, and that without such programming, they were likely to return to prison. Nonetheless, employment outcomes for those completing PSE coursework may be equally relevant to the discussion of recidivism, as many inmates, while feeling strongly that PSE would greatly strengthen their resumes, nevertheless anticipated that their incarceration and criminal history would cause difficulties in obtaining gainful employment once released. Several inmates identified this concern as the basis for their goal to run their own business upon release, with many inmates across all sites reporting that they wished to take the business ownership route.

Funding for PSE programs is an ongoing issue for the study sites and, we suspect, for other non-study sites that have PSE programming. All four program sites received funding from various sources for these programs, with IYO funding constituting a large percentage of program

budgets. Even with IYO grant funding, however, there continues to be concern among many stakeholders about sources of additional funding for these programs, as well how long those additional funds will continue.

A related issue is the administrative hurdles that program staff must overcome in order to maintain current programming levels. The sometimes controversial nature of such programs may be one reason why these programs can be difficult to administer and maintain. Nevertheless, as mentioned previously, both program staff and inmate participants place a high value on these programs, with program staff taking extra strides to ensure that these programs continue to run as smoothly as possible.

### **Quantitative Results**

After taking steps to compensate for missing data and nonrandom selection into the PSE and non-PSE groups, the analysis showed a marginally significant ( $p < .10$ ) reduction in postrelease re-incarceration for PSE participants in Indiana. The results for New Mexico also showed a statistically significant reduction in postrelease re-arrest ( $p < .05$ ). Similarly, the result for Massachusetts also showed a statistically significant decrease in postrelease arrests for PSE participants ( $p < .05$ ).

Although promising—all three of the effect sizes were negative and at least marginally statistically significant—the results of the quantitative analysis should be seen as a preliminary step in understanding the impact of prison-based PSE on recidivism. It is likely that important variations exist between institutions in terms of program structure, organization, and other potentially important factors that may affect the strength of the relationship between PSE and recidivism. Additionally, while substantial effort was put into addressing the problems presented by missing data and nonrandom assignment, these techniques cannot guarantee the same results as true random assignment.

## **Conclusion**

The research presented in this report expands our understanding of the impact of prison-based postsecondary education. The results of the qualitative component of the study indicate that inmates view their ability to engage in PSE as positive in ways that should, in principle, contribute to their success after release (e.g., increased confidence; development of marketable skills). However, the results of the quantitative study provide mixed results in terms of PSE's impact on postrelease recidivism. In two states, PSE was associated with a decrease in recidivism, while in a third it was associated with an increase. However, only one of these effects—a decrease in recidivism—was statistically significant.

Additional research is required to more clearly specify the relationship between prison-based PSE and recidivism. Randomized designs would increase confidence that the estimates of the impact of PSE are a function of the program itself rather than the characteristics of those who choose or who are given the opportunity to participate. Future research should also gather data to better understand how variations in how PSE is delivered (e.g., traditional classroom, closed-circuit television link) and the support provided by the institution (e.g., availability of study

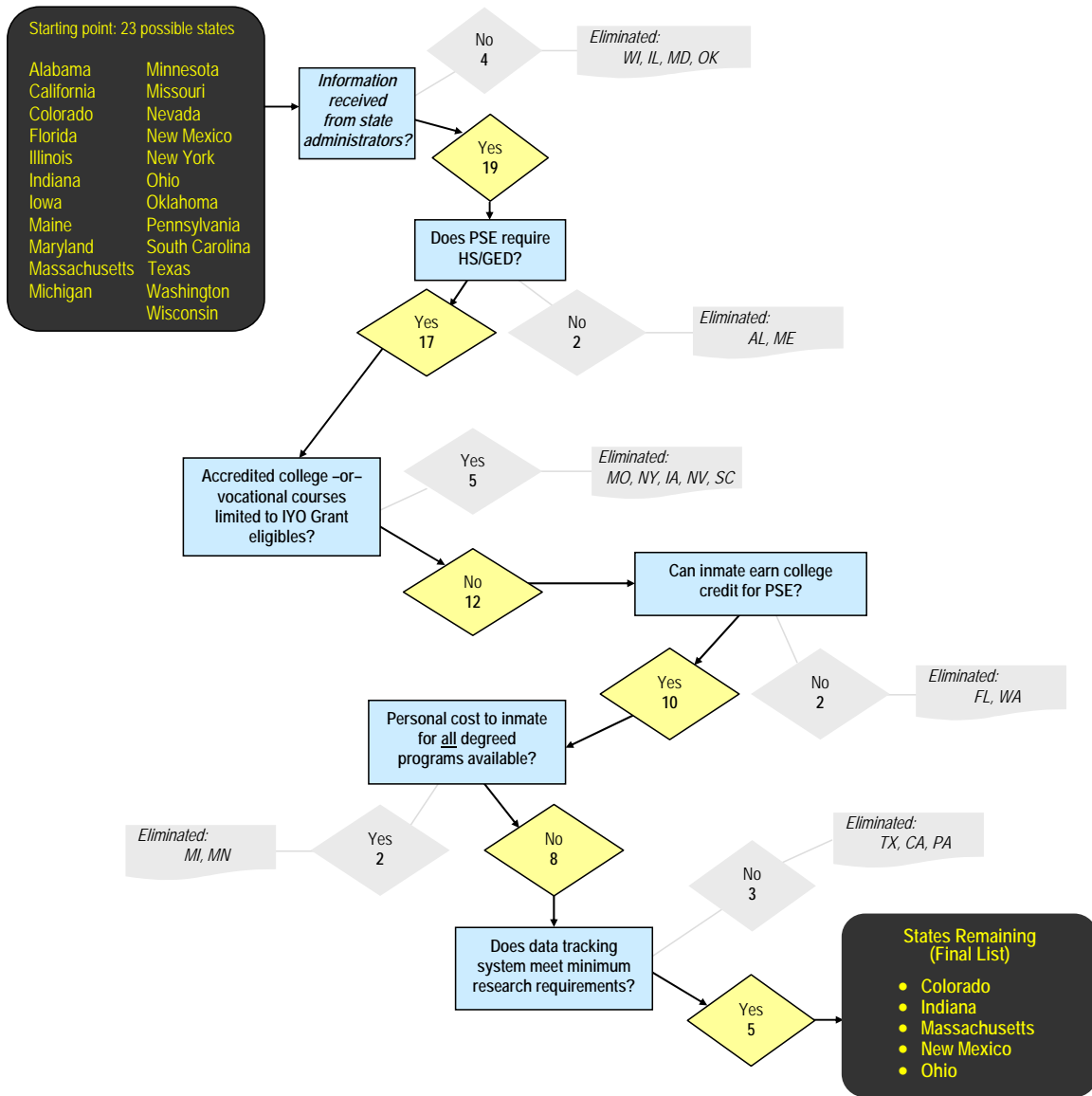
space, correctional officer attitudes towards PSE programs) may impact course completion rates and degree attainment. In addition, little is known about the relationship between type of degree or coursework subject matter and successful postrelease employment outcomes. This is another topic deserving of research attention.

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# Appendix A: Flow Chart for Selection of Candidate Study Sites

Figure 1. Site Selection Flowchart



*Note:* Several states were eliminated due to failure to meet multiple criteria. This decision flowchart reflects only the conditions by which they were first eliminated. The chart does not include the federal correctional system which was dropped because the occupational/vocational courses offered to federal inmates are unlikely to transfer for academic credit and because academic correspondence courses, taken by same inmates at their own expense, are not tracked when inmates transfer between facilities.

## **Appendix B: Detailed PSE Information by State System**

### **INDIANA**

As of December 2005, about 2,500 students were enrolled in PSE programs across 14 facilities in the state of Indiana. An estimated 1,700 were enrolled in associate's level courses, while another 800 were enrolled in bachelor's level coursework. In the area of vocational PSE, 75 to 80 inmates were taking courses that were transferable to an applied associate's degree. All inmates received onsite instruction from paid instructors. PSE programs were provided free to inmates who qualified for either the Incarcerated Youth Offender (IYO) grant or the State's higher education grant. These grants effectively funded the majority of participating inmates. The rate of self-paying students was extremely low in these programs, between 1 and 2 percent. Inmates in Indiana participating in PSE may complete certificates and degrees while incarcerated.

Of special interest in this study is the Purdue University PSE program operating out of the Westville Correctional Facility (a medium security facility) and the Indiana State Prison (formerly Lakeside Correctional Facility; a Minimum Security Unit). These programs served an estimated 87 and 35 inmates, respectively. Inmates at Westville are able to enroll in certificate programs from which they may continue on to earn an associate's degree in Organizational and Leadership Supervision (78 current enrollees) or a bachelor's degree (9 current enrollees); inmates at Indiana State Prison were offered associate's degree programs only.

### **MASSACHUSETTS**

In Massachusetts, vocational PSE coursework was available from accredited institutions in 19 public facilities and one private facility. Some inmates were also enrolled in self-paid correspondence courses. Boston University's Metropolitan College inmate program, established in 1972, is of special interest to the study as it offered inmates the opportunity to earn college degrees. This program operated in three medium security facilities and one minimum security facility. At the time of the study, the program enrolled 180 inmates, 110 of whom were resident at the Norfolk Prison for men. All inmates participating in Boston University's Metropolitan College program received onsite instruction from paid university instructors and worked toward obtaining a bachelor's degree in Interdisciplinary Studies. The program was funded and supported by the University, and there was no cost to participating inmates.

## **NEW MEXICO**

As of October 2005, an estimated 647 inmates were enrolled in PSE programs delivered in seven of the nine state prisons across New Mexico. Three hundred and nine students were enrolled in Business Administration and University Studies associate's degree programs; a new bachelor's in Business Administration had not yet enrolled students. An additional 338 inmates were enrolled in vocational certificate programs, for which they take one course per session. New Mexico programs used two delivery models. All college-level programs were taught via one-way Internet instruction while inmates enrolled in vocational courses received onsite instruction. Both onsite and Internet instruction was delivered by paid instructors. Employees of the New Mexico Corrections Department's Education Bureau taught all vocational programs. College courses were provided through a closed "Web Course Tools" (WebCt) connection to Eastern New Mexico University (ENMU). The closed WebCt connection was identical to ENMU's web-based instruction that was offered to other students, except that inmates could not access the Internet through a live system.



## Appendix C: Focus Group and Stakeholder Interview Sites

### COFFEEWOOD CORRECTIONAL CENTER (VIRGINIA)

#### Facility Characteristics

- Male inmates
- Publicly operated
- Average daily population= 1,181
- Level 2 of 6 VA security levels, with Level 1 being the least restrictive

#### Facility-Specific Requirements

- High school diploma or GED
- No Escape History within past 5 years
- Single life sentences must have reached their parole eligibility date (PED)

#### Program Details

- Multiple funding sources, including private donor (Coe Memorial Scholarship), federal Incarcerated Youth Offender Block Grants, inmate VA benefits, and inmates (self-pay)
- PSE delivered by Germanna Community College, Locust Grove, VA
- Classes taught onsite by college professors
- Inmates may earn an associate's degree in Business Education or Business Management

### CENTRAL NEW MEXICO CORRECTIONAL FACILITY (“THE FARM”)

#### Facility Characteristics

- Male Inmates, all have less than two and a half years until projected release.
- Publicly operated
- Average daily population = 336
- Level 1/minimum custody

#### Facility-Specific Requirements

- High school diploma or GED
- Criminal background and record of institutional behavior indicate ability to function appropriately and productively among staff and other inmates without the need for continuous staff supervision or a security perimeter
- Inmates not serving a sentence for murder, sex offense or child abuse
- Testing conducted to determine readiness (10th grade COSA reading level score)

#### Program Details

- PSE program funded by state and federal Incarcerated Youth Offender (IYO) Block Grants
- PSE delivered by Eastern New Mexico University (at Roswell and at Portales)
- Classes taught via one-way Internet connection (Web CT model)
- Offers associate's degree in Business Administration or University Studies, or bachelor's degree in Business Studies
- Program is statewide; inmates can continue classes when transferred to other institutions
- Inmates may receive funding to continue program after released
- Students sign contract agreeing to pay cost of class if they receive a D grade, drop out, or are written up for a disciplinary infraction
- Correctional staff also eligible for the program

## **NEW MEXICO WOMEN'S CORRECTIONAL FACILITY**

### Facility Characteristics

- Female inmates
- Privately operated by the Corrections Corporation of America (CCA)
- Average daily population=541
- Houses female inmates at all security levels- Level 1/minimum custody through Level VI/Maximum custody

### Facility-Specific Requirements

- High school diploma or GED
- No major disciplinary infractions over last 6 months
- Must be 6 months to 10 years from being released
- Testing conducted to determine readiness (10th grade COSA reading level score)

### Program Details

- Inmates participate in PSE as part of Project POWER; continuum of treatment services including life skills
- PSE program funded by state and federal Incarcerated Youth Offender (IYO) Block Grants
- PSE delivered by Eastern New Mexico University (at Roswell and at Portales)
- Some who do not qualify for Project POWER, or who are in segregation take correspondence courses through outside universities
- All classes are taught via one-way Internet connection (Web CT model)
- Inmates can earn an associate's degree in Business Administration or University Studies, or a bachelor's degree in Business Studies
- Program is statewide; inmates can continue classes when transferred to other institutions
- Inmates may receive funding to continue program after released (via partnership with Department of Labor and NM Probation and Parole)
- Students sign contract agreeing to pay cost of class if they receive a D grade, drop out, or are written up for a disciplinary infraction
- Correctional staff also eligible for the program

## **WESTVILLE CORRECTIONAL FACILITY (INDIANA)**

### Facility Characteristics

- Male Inmates
- Publicly operated
- Average daily population = 3,200
- Medium security level

### Facility-Specific Requirements

- High school diploma or GED
- Must pass Student Assessment and Measurement (SAM) test (education provider's requirement)
- Must provide academic transcripts, financial plan, and complete in-person interview
- The Indiana DOC must sign off on every student's enrollment
- Length of sentence not considered in eligibility assessment by education provider
- Conduct reports affect DOC assessment of eligibility, as well as continuation in the program. Serious conduct reports may disqualify inmates from PSE for 6 months to one year

### Program Details

- PSE program funded by the John Anderson Foundation, state grants, Incarcerated Youth Offender (IYO) Block Grants, and inmates (self-pay)
- PSE delivered by Purdue North Central University, Westville, IN
- Classes are taught onsite by college professors
- Inmates can earn associate's degree in Organizational Leadership and Supervision and/or a bachelor's degree in Liberal Studies

## Appendix D: Focus Group and Stakeholder Interview Questions

### FOCUS GROUP QUESTIONS

#### Introductory Questions

1. Why did you decide to enroll in post secondary education here at [NAME OF FACILITY]?
2. How did you learn that these courses or programs were available?
3. How many courses are you taking right now? How many do you usually take at a time?
4. Do you plan to take more courses at [FACILITY] in the future? Why or why not?

#### Details of PSE

1. Why did you decide to enter the specific courses (or program) you are taking (or previously took)?
2. (If applicable to facility) are you currently working on a degree, certificate, etc.?
3. Do you plan to take more classes and/or complete a degree after you are released?

#### Attitudes toward PSE Received

1. Do you think your courses or programs have been helpful so far? In what ways?
2. Have you gained useful skills from this course/program? (If yes) Do you believe the skills you have gained will be helpful/useful to you in the future, and how?
3. In general, would you say you are satisfied with your courses or program?(If yes) What are you satisfied about (what is going well)? (If no) For those of you who aren't satisfied, what's not going well?
4. Are there things about your program that you would like to see changed? (If so) What are they? How should they change? What kinds of things would you like to see happen?

#### Barriers

1. When you decided to enroll in your course or program, what was the process? How did you go about getting enrolled, or signed up?
2. Did you encounter any barriers in the enrollment process? (alt: Did you have any difficulty getting signed up?)
3. Was it easy to get the classes you wanted? If not, why? (Probe re: wait list, unavailability of courses in certain subjects, enrollment criteria individual inmates could not meet, etc.)
4. Were there any other enrollment issues (i.e., things about the process you found difficult)?

#### Attitudes/Skills

1. Do you believe that taking PSE courses has had any personal effect on you? For example, has it affected: Your self-esteem, or the way you feel about yourself? The way you look at the future? ...how so?
2. Do you believe that taking PSE courses has had any effect on you during your time here in [NAME OF FACILITY]? Do you think it has affected: Your attitude? Anything else?
3. Do you plan to seek work that is related to your courses or program after you are released? (exp: Employment where you can use the skills and knowledge you gained.) (If yes) Do you feel that your courses have prepared you for the type of work you are seeking, or do you think you will require more education?(If no) Why not?

#### Concluding Questions

1. Are there other recommendations that you have, or suggestions you would like to make?
2. What advice would you have for other inmates who are considering enrolling in PSE courses?
3. Is there anything else you would like to say before we wind up?

## STAKEHOLDER INTERVIEW QUESTIONS

### Program Goals

1. In your view, what are the goals or desired results for postsecondary educational programming within this facility? For the prison system overall?

### Program History

1. What year did this facility begin offering PSE courses?
2. What year did the state system begin offering PSE courses, to your knowledge?
3. How has the program/such courses evolved over time?

### Program Details

1. Currently, what types of courses are offered? Is there a semester/tri-semester schedule?
2. Do you think the course availability in general is enough, not enough, or too much?
3. What universities are affiliated with your program?
4. (if none) Who accredits the program? Who provides day-to-day management?
5. What are the qualifications of the teachers?
6. Please describe the communication that takes place between the university (or other educational staff outside the DOC) and the facility staff. Are any types of regular reports generated? How are reports/other outcome information used?
7. Do you consider this program to be innovative, as compared to other programs within the state, or similar? In what ways is it innovative?

### Program Use

1. Which inmates are eligible to take PSE courses?
2. Are inmates who participate in these programs different from the typical offender? How are they different?
3. What percentage of eligible inmates would you say takes advantage of these courses?

### Program Benefits/Accomplishments

1. In your view, what are some of the specific benefits to inmates who participate in PSE?
2. How about benefits to facility staff/this institution/the system as a whole?
3. What are some of the successes you've seen as a result of these courses?
4. Have there been any "let downs"? If so, what has been the biggest let down?

### Program Challenges

1. What are some of the challenges facing the PSE program (i.e. budgetary constraints, policy barriers re: inmate education, service delivery issues, lack of participation, etc)? How have these challenges been overcome?
2. What does the future hold for the PSE program (i.e., additional funding, program cuts, etc.)?
3. Do you see any changes for your program? On what level are these changes (facility, university partners, state, etc.)?

## Appendix E: Preparation of Administrative Data for Analysis

In preparing the administrative data for the quantitative analysis we had to overcome the challenges presented by both missing data and the potential for sample selection bias. Missing data was an issue for each of the states included in the analysis. We were missing data on the educational attainment of substantial numbers of our subjects in Indiana and Massachusetts. We were also missing criminal histories for lesser numbers of subjects in New Mexico and Massachusetts. Finally, since our goal was to draw causal inferences about the effect of in-prison PSE on recidivism using observational data, we had to address the selection bias that is often present in data when subjects are not randomly assigned to study conditions as part of a formal study design. Prisoners who choose to participate in PSE while in prison, or are allowed to do so by prison officials, are likely to differ from other prisoners who do not participate in PSE in other ways that may affect their risk of recidivism.

This appendix describes the methods used to address the missing data and selection bias challenges and the data we were able to obtain from each state. The results of the outcome analyses are presented in the body of this report as well as described in further detail in Appendix F.

### ***Methodological Approach***

McCaffrey, Ridgeway, and Morral (2004) present an approach for addressing selection bias in observational data by estimating propensity scores using boosted regression. In contrast with conventional approaches to the selection problem (e.g., logistic regression), boosted regression is nonparametric and readily handles large numbers of independent variables. As result of these advantages, boosted regression does not assume particular functional form between the independent and dependent variables nor does it require selectively including independent variables in the model.

We performed the data analysis using the R (R Development Core Team, 2008) programming language. The *gbm* (Ridgeway, 2007) and *twang* (Ridgeway, McCaffrey, and Morral, 2006) packages extend R by providing functions that implement the boosted regression approach described by McCaffrey et al. (2004).

We used the boosted regression framework to address both the missing data and selection bias challenges. Whenever information on a particular measure is missing on a substantial number of cases, the concern is that the cases for which the measure is available are not representative of the sample as whole. If the pattern of missing data is correlated with the outcome of interest (i.e., recidivism in our study), failing to correct for the missing data will lead to biased estimates of the effect of the intervention (i.e., in-prison PSE).

To address the missing data concern, we created a dummy variable (*M*) indicating which subjects (*i*) were missing on a particular measure and estimated boosted regression model with the dummy variable as the dependent variable and using the remaining measures (excluding the

recidivism outcome measures and the treatment variable indicating PSE participation) as independent variables.<sup>7</sup> The boosted regression model returned a vector of predicted probabilities ( $\hat{P}$ ) estimating for each subject the probability that the subject was missing data conditional on the independent variables (i.e., a predicted value of  $M_i$ ). We converted the predicted probability into a weight ( $W$ ) equal to the inverse of the predicted probability of each subjects' *actual* value of  $M_i$ :

$$\text{if } M_i = 1 \text{ then } W_i = \frac{1}{\hat{P}_i} \quad (1)$$

$$\text{if } M_i = 0 \text{ then } W_i = \frac{1}{1 - \hat{P}_i} \quad (2)$$

To the extent that the boosted regression model accounts for the pattern of missing data, applying the weight to the subjects with nonmissing data should make their characteristics resemble those of the entire sample. After creating the weights, we excluded subjects with missing data ( $M_i = 0$ ) and subjects who did not meet the criteria to be members of the comparison group (i.e., they entered prison without a high school credential or having already earned a PSE degree). To ensure that the weight did not inflate or deflate our variance estimates, we normalized the weights ( $S_i$ ):

$$S_i = W_i \frac{n}{\sum_{i=1}^n W_i} \quad (3)$$

where  $n$  is the number of subjects in the restricted sample.

Next, we estimated another boosted regression model on the restricted sample with the treatment variable ( $T$ ) as the dependent variable. We applied the normalized missing data weights ( $S$ ) to the estimation of this model. The purpose of this model, which is typically referred to as a propensity model, was to develop an estimate of the probability that each subject would participate in PSE while incarcerated. In other words, the model is intended to explain why some subjects participated in PSE while others did not based on the observed covariates in each sample. We used the predicted probabilities ( $\hat{P}$ ) from this model to create a second weight ( $Q$ ) as follows:

$$\text{if } T_i = 1 \text{ then } Q_i = 1 \quad (4)$$

$$\text{if } T_i = 0 \text{ then } Q_i = \frac{\hat{P}_i}{1 - \hat{P}_i} \quad (5)$$

where  $T_i = 1$  for subjects who participated in PSE and 0 otherwise. By this formula, the magnitude of the weights are assigned so that the weight of the comparison subjects is directly

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<sup>7</sup> All of the boosted regression models, including the propensity models described later in this section were estimated using a stopping rule that minimized the maximum Kolmogorov-Smirnov (KS) statistic, a maximum of 10,000 trees, a maximum interaction depth of 3, and a maximum of 1,000 iterations of the permutation test for the KS statistic.

proportional to the extent to which they resemble the treatment subjects on the observed covariates. The effective sample size (ESS) (see Equation 6) provides an estimate of the sample size that reflects the number of comparison subjects that were similar to the treatment subjects (McCaffrey et al., 2004):

$$ESS = \frac{\left( \sum_{i \in C} w_i \right)^2}{\sum_{i \in C} w_i^2} + \sum_{i \in T} w_i \quad (6)$$

where  $w_i$  is the original propensity weight and  $C$  and  $T$  denote membership in the non-PSE and PSE groups, respectively. To create our final weight ( $W_i$ ), we normalized the propensity weights ( $w_i$ ) of the non-PSE subjects by applying Equation 7

$$W_{i \in C} = w_{i \in C} \frac{\left( \frac{\left( \sum_{i \in C} w_i \right)^2}{\sum_{i \in C} w_i^2} \right)}{\sum_{i \in C} w_i} \quad (7)$$

to ensure that our variance estimates appropriately reflected the number of *comparable* PSE and non-PSE subjects in our sample. We did not normalize the weights of the PSE subjects since the propensity modeling process did not modify their weights. The PSE subjects were weighted by the normalized missing data weights that we developed for them:

$$W_{i \in T} = S_{i \in T} \quad (8)$$

At this point, the restricted sample, weighted by  $W$  should be equivalent to experimentally collected data, where the subjects had been randomly assigned to receive PSE or not, provided that the observed covariates (i.e., the demographic, criminal history, and sentence length included in the boosted regression models) fully account for both the missing data and the selection bias problems. In this analysis, that assumption is not likely to be fully met as there are several potentially relevant measures that were unavailable (e.g., prison policies regarding inmates' eligibility for PSE, inmate transfers from one prison to another, whether any limitations on the number of inmates who may participate in PSE may have affected patterns of enrollment). As a consequence, the inferences from this analysis should be interpreted cautiously.

We estimated the effect of in-prison PSE on our outcome measures (i.e., arrest and return to prison) using logistic regression models. Specifically, for each combination of state and available outcome, we estimated two logistic regression models: a base model containing only an intercept term and the treatment variable and a stepwise model containing additional covariates and

interaction terms necessary to address any remaining nonequivalence between the treatment and comparison subjects.

## ***Development of State Specific Datasets***

### **Indiana**

#### **Missing Data Correction**

The Indiana Department of Public Safety (DPS) provided prison admission and release records for the entire state for 1997–2006. For each prisoner, we defined the “instant” incarceration as the incarceration resulting in the first prison release on or after January 1, 2002, and not later than December 31, 2004. We identified instant releases for 33,981 persons during the cohort period who were released into the community, under supervision or not, in Indiana.

We tried, without success, to obtain data on subjects’ postsecondary course enrollments and completions directly from the colleges and universities that provide PSE to inmates in Indiana prisons. Instead, we used DOC data on the subjects’ educational attainment at prison admission and release. These data are based on inmate self-reports made during their admission and release interviews with correctional authorities. The educational attainment data distinguished inmates who reported holding any two- or four-year postsecondary degree from those who reported holding a high school diploma or GED. From this information, we were able to distinguish subjects who completed a postsecondary degree during the instant incarceration (i.e., those in the treatment condition) from those who entered and exited the instant incarceration holding a high school diploma or equivalency as their terminal degree (i.e., those in the comparison condition).

We were missing data on the educational attainment of 5,020 of the Indiana releasees. This was an especially salient missing data problem because, as noted above, the educational attainment measures were used as the foundation for the treatment variable in Indiana. Before estimating the model to reweight the sample to account for the missing data, we excluded 813 persons for whom we were missing data on race or the type of offense that lead to their instant prison term. After creating the missing data weight, we excluded 17,073 prison releasees who began their instant term of incarceration without completing high school or a GED and 635 persons who entered prison with a postsecondary degree. Table 4 contrasts descriptive statistics for two overlapping sets of cases: the (weighted) set of persons whose educational status was known and qualified them for the study and the (unweighted) set of persons which includes everyone in the weighted set as well those whose educational attainment was missing. To the extent that the weighting procedure was successful, the two columns of descriptive statistics should be identical. In fact, they are similar with some notable differences (e.g., the weighted column shows a longer average prison stay and younger average ages at prison admission and release).

Among the 10,440 persons remaining in the analysis sample after the weighting and subsetting, we had a weighted sample<sup>8</sup> of 10,112 comparison subjects who entered and exited their instant

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<sup>8</sup> The phrase “weighted sample size” is used to refer to the sum of the weights for a subset of the persons whereas “sample size” refers to the number of physical records in the subset.



term with a high school education, and 328 treatment subjects who entered prison with a high school education and exited with a two- or four-year postsecondary degree.

We were unable to obtain criminal history information for the Indiana subjects. To compensate for this, we used the length of the instant incarceration, the most serious type of offense leading to the instant incarceration, and the number of institutional conduct infractions as proxy measures of each subjects' criminal propensity. Since we lacked arrest data, we constructed a binary recidivism measure indicating whether each subject was returned to prison for any reason (i.e., whether for a new offense or technical violation) during the first year after release from their instant term of incarceration.

**Table 4. Indiana: Descriptive Statistics of Weighted and Unweighted Samples**

Measure	Unweighted N = 15460			Weighted N = 1044		
Biological sex						
Female	12%	(1890)		13%	(1330)	
Male	88%	(13570)		87%	(9110)	
Race						
Black	35%	(5394)		36%	(3742)	
Other	2%	(369)		2%	(211)	
White	63%	(9697)		62%	(6487)	
Most serious offense leading to instant prison admission						
Other	16%	(2459)		16%	(1674)	
Person	16%	(2445)		15%	(1541)	
Property	36%	(5538)		37%	(3811)	
Society/Drug	32%	(5018)		33%	(3414)	
Age at instant prison admission	25.0	32.0	40.0	23.9	30.5	37.7
Year of instant prison admission						
1978-1999	16%	(2444)		12%	(1268)	
2000	7%	(1006)		9%	(968)	
2001	17%	(2607)		23%	(2388)	
2002	27%	(4237)		27%	(2783)	
2003-2004	33%	(5166)		29%	(3033)	
Maximum length of instant prison term [log(days)]	6.2	7.0	7.8	5.8	6.3	6.9
Number of infractions during instant prison term	0.0	0.0	1.0	0.0	0.0	0.9
Length of instant prison stay (days)	90.0	262.0	724.0	147.0	296.3	632.3
Age at instant prison release	27.0	34.0	42.0	25.3	31.8	38.8
Type of instant prison release						
Discharge	11%	(1651)		8%	(862)	
Parole	41%	(6334)		44%	(4574)	
Probation	39%	(6055)		36%	(3788)	
Reentry Program	9%	(1420)		12%	(1216)	
Year of instant prison release						
2002	36%	(5562)		37%	(3908)	
2003	33%	(5151)		33%	(3418)	
2004	31%	(4747)		30%	(3114)	

*a b c* represent the lower quartile *a*, the median *b*, and the upper quartile *c* for continuous variables. Numbers in parentheses are frequencies.

### Propensity Score Weighting to Balance PSE and Non-PSE Groups

The treatment and comparison subjects in the Indiana sample differed substantially, suggesting that the propensity model would need to address an acute selection bias (see Table 5). Prisoners

who participated in PSE served more than three times as many days in prison as prisoners who did not participate in PSE. The average PSE participant also entered prison at a younger age and accumulated more infractions while incarcerated. On their face, these differences suggest that the criminal propensity of the typical PSE participant likely exceeded that of the typical comparison subject. It is somewhat surprising then to note that a smaller proportion of PSE subjects were reincarcerated during the first year following their release. This observation would likely be less surprising had we been able to obtain criminal history data for the Indiana sample. In the other two states, where criminal histories were obtained, we found that prisoners who participated in PSE had more arrests for crimes against persons (i.e., violence) but fewer total arrests than prisoners in the comparison group. This observation suggests that criminal history is likely an important omitted variable in the Indiana analysis.

**Table 5. Indiana: Contrasting Treatment and Comparison Subjects**

Measure	No PSE N = 10112			PSE N = 328		
Returned to prison within one year of instant prison release						
False	93%	(9401)		98%	(320)	
True	7%	(710)		2%	(8)	
Biological sex						
Female	12%	(1258)		10%	(33)	
Male	88%	(8853)		90%	(295)	
Race						
Black	36%	(3597)		39%	(127)	
Other	2%	(199)		1%	(3)	
White	62%	(6315)		60%	(197)	
Year of instant prison admission						
1978-1999	12%	(1250)		48%	(159)	
2000	8%	(771)		20%	(66)	
2001	20%	(2066)		17%	(55)	
2002	28%	(2813)		10%	(34)	
2003-2004	32%	(3213)		4%	(14)	
Age at instant prison admission	24.0	30.6	37.7	22.5	28.5	35.8
Most serious offense leading to instant prison admission						
Other	16%	(1603)		12%	(39)	
Person	15%	(1496)		24%	(80)	
Property	37%	(3731)		32%	(106)	
Society/Drug	32%	(3281)		32%	(104)	
Maximum length of instant prison term [log(days)]	5.8	6.3	6.9	6.7	7.1	7.6
Number of infractions during instant prison term	0.0	0.0	0.9	0.0	0.9	2.6
Year of instant prison release						
2002	38%	(3852)		27%	(88)	
2003	32%	(3257)		40%	(133)	
2004	30%	(3003)		33%	(108)	
Type of instant prison release						
Discharge	9%	(954)		4%	(13)	
Parole	43%	(4366)		44%	(143)	
Probation	37%	(3701)		40%	(132)	
Reentry Program	11%	(1091)		12%	(40)	
Length of instant prison stay (days)	143.7	283.2	593.4	707.3	1010.2	1465.1

*a b c* represent the lower quartile *a*, the median *b*, and the upper quartile *c* for continuous variables. Numbers in parentheses are frequencies.

After estimating and applying the propensity weight, we computed several statistics to assess whether the propensity model had successfully balanced the two samples (see Table 6). These

statistics included the standardized mean difference effect size ( $d$ ), the ratio of the treatment and comparison group variances, and the Kolmogorov-Smirnov test. These statistics showed that the two groups were reasonably well balanced.

**Table 6. Indiana: Study Group Balance After Propensity Score Weighting**

Measure	$d$	$p$	V. Ratio	KS	$p$
Biological sex	-0.040	0.615	0.902	0.012	0.526
Race					
Black	0.010	0.564	1.004	0.005	0.880
Other	-0.081		0.562	0.008	0.294
White	0.007		1.000	0.003	0.910
Most serious offense leading to instant prison admission					
Other	0.004	0.722	1.006	0.001	0.946
Person	0.055		1.074	0.023	0.354
Property	-0.063		0.959	0.029	0.295
Society/Drug	-0.010		1.009	0.005	0.882
Age at instant prison admission	0.004	0.950	0.994	0.024	0.953
Year of instant prison admission					
1978-1999	0.078	0.259	1.012	0.039	0.202
2000	0.007		1.010	0.003	0.904
2001	-0.003		0.995	0.001	0.952
2002	-0.040		0.909	0.012	0.525
2003-2004	-0.143		0.610	0.029	0.060
Maximum length of instant prison term [log(days)]	0.162	0.014	0.720	0.061	0.203
Number of infractions during instant prison term	-0.005	0.939	0.884	0.053	0.159
Length of instant prison stay (days)	0.097	0.210	0.993	0.060	0.269
Age at instant prison release	0.023	0.703	0.986	0.029	0.891
Type of instant prison release					
Discharge	-0.035	0.908	0.863	0.007	0.559
Parole	0.018		1.004	0.009	0.760
Probation	-0.020		0.992	0.010	0.761
Reentry Program	0.023		1.057	0.008	0.728
Year of instant prison release					
2002	-0.106	0.112	0.907	0.047	0.110
2003	0.117		1.064	0.058	0.063
2004	-0.023		0.983	0.011	0.717

Note: All statistics contrast the treatment group subjects with the propensity-weighted comparison group subjects.

$d$  is the standardized mean difference effect size calculated as the difference in the group means divided by the treatment group standard deviation; values nearer zero indicate better balance. The associated  $p$  values for the  $d$  statistics appear in the adjacent column. Two-category measures (e.g., ethnicity) are summarized on one row since the statistics are identical (save for the sign of the effect size) for both categories. Measures with more than two categories are summarized (on the row for the first category) with an overall measure of the significance of the differences across all categories.

Variance ratio (V. Ratio) is the treatment group variance divided by the comparison group variance. Values nearer one indicate better balance.

KS is the two-sample Kolmogorov-Smirnov (KS) statistic testing the null hypothesis that the two groups were drawn from the same distribution. Values nearer zero indicate better balance, and the  $p$ -value of each test statistic appears in the adjacent column.

## Massachusetts

### Missing Data Correction

Three agencies in Massachusetts provided data for this study. The Massachusetts Department of Corrections provided data on prison admissions and releases. The Criminal Offender Record Information (CORI) agency provided information on arrests in Massachusetts. Boston University, the provider of PSE to inmates in Massachusetts, contributed data on inmates' participation in PSE. We defined a three-year prison release cohort comprised of inmates released on or after January 1, 2003 and not later than December 31, 2005. We identified 6,484 persons who were released, under supervision or not, during the cohort period. We excluded 45 for whom we were missing either a Social Security number or a date of birth to match their correctional record with their criminal history. On the remaining 6,439 persons, we estimated two boosted regression models to adjust for the 569 for whom we were missing criminal histories and the 2,585 without educational attainment data.

While processing the Massachusetts data, we discovered that at some point before the CORI staff searched their data to retrieve the criminal histories of the prison releasees we had identified, the Social Security numbers were converted from nine digit strings to integers.<sup>9</sup> Since many of the releasees had Social Security numbers with one or more leading zeros, this data type conversion effectively invalidated the most discriminating personal identifier available for matching the correctional and criminal history records for many of the releasees. We responded to this error by creating three additional measures for the Massachusetts subjects that we expected would be strongly correlated with missing criminal histories. One of these measures was a dummy variable indicating whether the releasee's Social Security number included a leading zero. The two others were continuous measures expressing how commonly each releasee's first and last name, respectively, appeared in the corpus of criminal history records returned by CORI. In fact, we found that the two common name measures were both among the four best predictors of missing criminal history, whereas having a Social Security number with a leading zero was a much less important factor in the model.

After estimating the two missing data models, we multiplied the two weights and normalized the product to create a single weight to adjust for both the missing criminal histories and missing educational attainment. Then, we excluded 1,891 persons who began their instant term of incarceration without completing high school or a GED and 184 persons who had entered prison with a postsecondary degree. We used this restricted set of persons to prepare Table 7 contrasting the characteristics of the (unweighted) set of prison releasees that were known to be eligible for the study or were missing criminal history or educational attainment data with the (weighted) set of releasees that we analyzed. The table demonstrates that the weighting procedure was only somewhat successful in adjusting for the cases lost to the two types of missing data. In light of the magnitude of the missing data problem in the Massachusetts data, it is not surprising that the weighting procedure was only partially successful. As a consequence, the findings in Massachusetts will be less conclusive than they would have been had we been able to construct complete records for all of the releasees.

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<sup>9</sup> We are uncertain at what point in the chain of custody the data type conversion was introduced.

**Table 7. Massachusetts: Descriptive Statistics of Weighted and Unweighted Samples**

Measure	Unweighted N = 4364		Weighted N = 1407	
Biological sex				
Female	31%	(1357)	26%	(361)
Male	69%	(3007)	74%	(1046)
Race				
Black	26%	(1116)	28%	(397)
Other	5%	(202)	2%	(24)
White	70%	(3046)	70%	(986)
Ethnicity				
Non-Hispanic	82%	(3560)	86%	(1205)
Hispanic	18%	(804)	14%	(202)
Age at first arrest	17.0	18.0	24.0	12.1
Year of instant prison admission				
1968-1996	16%	(699)	15%	(218)
1997-2000	23%	(1019)	18%	(254)
2001	10%	(437)	8%	(111)
2002	14%	(631)	15%	(211)
2003	17%	(756)	23%	(318)
2004-2005	19%	(822)	21%	(295)
Age at instant prison admission	24.0	31.0	39.0	18.8
Most serious offense leading to instant prison admission				
Other	15%	(638)	12%	(162)
Person	44%	(1937)	48%	(669)
Property	17%	(734)	18%	(249)
Society/Drug	24%	(1055)	23%	(327)
Resided out of state at instant prison admission				
In-state	95%	(4128)	94%	(1328)
Out-of-state	5%	(236)	6%	(79)
Security risk level at instant prison admission				
Low	0%	(8)	0%	(3)
2	14%	(591)	14%	(200)
3	18%	(770)	21%	(292)
4	61%	(2641)	54%	(756)
5	3%	(128)	4%	(55)
High	5%	(226)	7%	(101)
Year of instant prison release				
2003	40%	(1726)	13%	(179)
2004	29%	(1287)	26%	(371)
2005	31%	(1351)	61%	(857)
Type of instant prison release				
Discharge	67%	(2916)	59%	(827)
Parole	33%	(1448)	41%	(580)
Commonness of first name among criminal histories	1.0	18.0	87.0	1.1
Commonness of last name among criminal histories	1.0	3.0	11.0	0.9
SSN has leading zero				
False	17%	(760)	14%	(195)
True	83%	(3604)	86%	(1212)

*a b c* represent the lower quartile *a*, the median *b*, and the upper quartile *c* for continuous variables. Numbers in parentheses are frequencies.

After weighting the final analysis sample of 1,407 persons, we had a weighted sample size of 1,274 persons who entered their instant term with a high school education and did not receive PSE while incarcerated, thereby qualifying them as comparison subjects for our study. That left us with a weighted sample of 133 treatment subjects who entered prison with a high school education and enrolled in one or more PSE courses while incarcerated. For the Massachusetts subjects, we constructed one recidivism measure indicating whether the subjects were arrested for a new offense during the first year following their release from incarceration.

### **Propensity Score Weighting to Balance PSE and Non-PSE Groups**

A naïve comparison of the treatment and comparison groups showed that fewer of the treatment subjects failed (see Table 8). And, the treatment subjects were more likely than the comparison subjects to have been imprisoned for a crime against persons and served longer terms. The treatment subjects were somewhat older, on average, than the comparison subjects when they entered prison. Massachusetts provided criminal histories and data about the risk level to which each subject was assigned when entering prison. As a result, we also know that the typical treatment subject had somewhat fewer arrests in his or her criminal history and was more likely to have been assigned to a lower security risk level. The treatment subjects were also older, on average, when they were first arrested, which suggests they had a lower average criminal propensity.

The model we estimated to rebalance the sample and eliminate these differences was largely successful (see Table 9). Even after reweighting, however, there was some evidence that the treatment group subjects had served longer prison sentences.

**Table 8. Massachusetts: Contrasting Treatment and Comparison Subjects**

Measure	No PSE N = 1274			PSE N = 133		
Arrested within one year of instant prison release						
False	68%	(865)		84%	(112)	
True	32%	(409)		16%	(21)	
Biological sex						
Female	28%	(354)		16%	(21)	
Male	72%	(920)		84%	(111)	
Race						
Black	25%	(318)		32%	(42)	
Other	2%	(31)		6%	(8)	
White	73%	(926)		62%	(83)	
Ethnicity						
Non-Hispanic	85%	(1077)		87%	(115)	
Hispanic	15%	(197)		13%	(17)	
Age at first arrest	12.0	14.8	21.9	15.0	20.3	32.3
Year of instant prison admission						
1968-1996	15%	(191)		53%	(70)	
1997-2000	20%	(255)		30%	(39)	
2001	9%	(109)		8%	(11)	
2002	15%	(190)		3%	(4)	
2003	20%	(255)		4%	(5)	
2004-2005	22%	(274)		2%	(3)	
Age at instant prison admission	18.7	25.2	35.4	22.1	30.0	44.8
Most serious offense leading to instant prison admission						
Other	15%	(192)		2%	(2)	
Person	44%	(563)		75%	(99)	
Property	17%	(211)		11%	(15)	
Society/Drug	24%	(308)		12%	(16)	
Resided out of state at instant prison admission						
In-state	95%	(1206)		90%	(120)	
Out-of-state	5%	(68)		10%	(13)	
Security risk level at instant prison admission						
Low	13%	(170)		21%	(28)	
2	21%	(271)		12%	(16)	
3	56%	(719)		64%	(85)	
4	3%	(40)		1%	(1)	
High	6%	(75)		2%	(3)	
Year of instant prison release						
2003	23%	(293)		48%	(64)	
2004	26%	(335)		33%	(44)	
2005	51%	(646)		19%	(25)	
Type of instant prison release						
Discharge	63%	(797)		60%	(79)	
Parole	37%	(478)		40%	(53)	
Length of instant prison stay [log(days)]	4.4	5.1	6.6	5.7	7.4	12.5
Arrests for any offense prior to instant prison term	4.9	8.9	15.8	3.4	8.0	15.4
Arrests for person offenses prior to instant prison term	0.7	1.7	3.5	1.1	2.0	3.7
Arrests for property offenses prior to instant prison term	0.8	2.5	6.3	0.0	1.6	5.7
Arrests for social order offenses prior to instant prison term	0.7	2.1	4.4	0.0	1.4	3.5
Arrests for traffic offenses prior to instant prison term	0.0	0.0	1.3	0.0	0.0	1.3
Arrests for other offenses prior to instant prison term	0.0	0.0	0.9	0.0	0.0	0.7
Prior arrests per year	0.2	0.3	0.5	0.1	0.3	0.5

*a b c* represent the lower quartile *a*, the median *b*, and the upper quartile *c* for continuous variables. Numbers in parentheses are frequencies.

**Table 9. Massachusetts: Study Group Balance After Propensity Score Weighting**

Measure	<i>d</i>	<i>p</i>	V. Ratio	<i>KS</i>	<i>p</i>
Biological sex	0.072	0.447	1.158	0.027	0.574
Ethnicity	0.010	0.943	0.977	0.003	0.954
Race					
Black	-0.011	-0.944	0.991	0.005	0.944
Other	0.046		1.217	0.011	0.705
White	-0.012		1.004	0.006	0.919
Resided out of state at instant prison admission	-0.044	0.749	1.133	0.013	0.713
Most serious offense leading to instant prison admission					
Other	-0.364	0.128	0.265	0.044	0.116
Person	0.238		0.821	0.103	0.101
Property	-0.019		0.957	0.006	0.895
Society/Drug	-0.162		0.744	0.053	0.285
Age at instant prison admission	-0.017	0.905	1.068	0.059	0.935
Year of instant prison admission					
1968-1996	0.153	0.326	1.004	0.076	0.246
1997-2000	-0.018		0.987	0.008	0.890
2001	0.056		1.207	0.016	0.627
2002	-0.099		0.663	0.018	0.539
2003	-0.124		0.632	0.024	0.472
2004-2005	-0.307		0.329	0.042	0.148
Security risk level at instant prison admission					
Low	0.085	0.235	1.147	0.035	0.514
2	-0.044		0.909	0.014	0.785
3	0.099		0.956	0.048	0.495
4	-0.226		0.273	0.018	0.300
High	-0.328		0.339	0.050	0.115
Length of instant prison stay [log(days)]	0.315	0.018	0.641	0.097	0.617
Age at instant prison release	0.160	0.223	1.055	0.137	0.156
Type of instant prison release	-0.031	0.816	1.012	0.015	0.823
Year of instant prison release					
2003	0.256	0.036	1.094	0.128	0.039
2004	0.009		1.009	0.004	0.955
2005	-0.338		0.700	0.132	0.038
Age at first arrest	-0.074	0.593	0.832	0.066	0.749
Prior arrests per year	-0.076	0.589	0.875	0.074	0.873
Arrests for any offense prior to instant prison term	-0.022	0.879	1.024	0.048	0.982
Arrests for person offenses prior to instant prison term	0.120	0.413	2.142	0.058	0.769
Arrests for property offenses prior to instant prison term	-0.103	0.461	0.693	0.060	0.821
Arrests for social order offenses prior to instant prison term	-0.059	0.657	0.842	0.059	0.772

Note: All statistics contrast the treatment group subjects with the propensity-weighted comparison group subjects.

*d* is the standardized mean difference effect size calculated as the difference in the group means divided by the treatment group standard deviation; values nearer zero indicate better balance. The associated *p* values for the *d* statistics appear in the adjacent column. Two-category measures (e.g., ethnicity) are summarized on one row since the statistics are identical (save for the sign of the effect size) for both categories. Measures with more than two categories are summarized (on the row for the first category) with an overall measure of the significance of the differences across all categories.

Variance ratio (V. Ratio) is the treatment group variance divided by the comparison group variance. Values nearer one indicate better balance.

*KS* is the two-sample Kolmogorov-Smirnov (*KS*) statistic testing the null hypothesis that the two groups were drawn from the same distribution. Values nearer zero indicate better balance, and the *p*-value of each test statistic appears in the adjacent column.



## **New Mexico**

### **Missing Data Correction**

The collection of data that we received from New Mexico proved to be the most complete set of records from the three states, but even the New Mexico data required some remedial reweighting. We requested and received data from the New Mexico Department of Corrections on prison admission and releases, institutional infractions, the educational attainment of prison inmates, and transcript records for inmates who participated in PSE. We also received arrest records from the state's Department of Public Safety. Staff within the Education Bureau of the Department of Corrections informed us that their records on the PSE program were not systematic and comprehensive prior to 2003. Consequently, we defined our cohort period as spanning from January 1, 2003 through December 31, 2005. We identified 8,851 persons released one or more times from New Mexico prisons during that period. We discarded eight of these person-releases, seven because the inmates had been released upon death and one because the inmate was released after being held for another criminal justice agency. This left us with 8,843 person-releases during our three-year cohort period.

We excluded 376 released persons for whom we were missing prison admission records, ethnicity, age at first arrest, or the circumstances of their release from prison. After dropping these cases, we were missing criminal history data on 4,479 persons. We estimated a missing data model on this restricted set of cases and developed a weight.

Next, we excluded 4,450 persons who began their instant term of incarceration without completing high school or a GED and 12 persons who had entered prison with a postsecondary degree. As with the other two states, we created Table 10 to assess the extent to which the weight succeeded in adjusting the cases with complete data to resemble the full sample of cases (including those cases for which we were missing criminal histories). The weighting procedure was more successful in New Mexico, perhaps due to the fact that we were missing data on a smaller proportion of our potential study subjects (i.e., persons whose educational attainment at prison admission qualified them for the study) in New Mexico relative to the other two states.

The final analysis sample included 3,873 persons who were released from prison during the cohort period. After weighting the sample cases, we were left with a weighted sample of 3,520 comparison subjects, who entered their instant term with a high school education and did not receive PSE while incarcerated and 353 treatment subjects, who entered prison with a high school education and enrolled in one or more PSE courses while incarcerated.

As in the other states, we defined the follow-up period as the year after release from the instant incarceration. We defined our recidivism measure in a manner analogous to the one developed for Massachusetts, a binary indicator of whether the subject was arrested in New Mexico during the follow-up period, either for a new offense or a technical violation.

**Table 10. New Mexico: Descriptive Statistics of Weighted and Unweighted Samples**

Measure	Unweighted N = 4005			Weighted N = 3873		
Biological sex						
Female	10%	(414)		10%	(406)	
Male	90%	(3591)		90%	(3467)	
Race						
Black	10%	(385)		9%	(362)	
Other	10%	(416)		10%	(404)	
White	80%	(3204)		80%	(3107)	
Ethnicity						
Non-Hispanic	47%	(1894)		47%	(1809)	
Hispanic	53%	(2111)		53%	(2064)	
Year of instant prison admission						
1965-1996	4%	(153)		4%	(140)	
1997-2001	25%	(989)		25%	(949)	
2002-2005	71%	(2863)		72%	(2784)	
Age at instant prison admission	25.0	32.0	40.0	24.5	30.4	38.2
Most serious offense leading to instant prison admission						
Other	5%	(190)		5%	(188)	
Person	27%	(1062)		26%	(1010)	
Property	30%	(1214)		30%	(1176)	
Society/Drug	38%	(1539)		39%	(1499)	
Maximum length of instant prison term [log(days)]	6.6	7.2	7.7	6.0	7.0	7.8
Number of minor infractions during instant prison term	0.0	0.0	1.0	0.0	0.0	0.9
Number of major infractions during instant prison term	0	0	0	0	0	0
Year of instant prison release						
2003	36%	(1430)		36%	(1393)	
2004	34%	(1362)		34%	(1315)	
2005	30%	(1213)		30%	(1165)	
Type of instant prison release						
Discharge	21%	(847)		21%	(817)	
Other	1%	(56)		1%	(50)	
Parole	77%	(3102)		78%	(3006)	

*a b c* represent the lower quartile *a*, the median *b*, and the upper quartile *c* for continuous variables. Numbers in parentheses are frequencies.

### Propensity Score Weighting to Balance PSE and Non-PSE Groups

In most respects, the pattern of between-group differences (see Table 11) was similar to what we found in the other two states. Prisoners who participated in PSE had fewer prior arrests, on average, than the comparison subjects and were more likely to have been incarcerated for a crime against persons. However, unlike in the other two states, the typical treatment subject in New Mexico was somewhat younger than the typical comparison subject at the start of their instant prison term and at the time of their first arrest. After estimating the propensity model and applying the weight, these differences effectively disappeared (see Table 12). The propensity model for New Mexico was the most successful of the three states; no statistically significant ( $p < .10$ ) differences remained after the propensity weight was applied.

**Table 11. New Mexico: Contrasting Treatment and Comparison Subjects**

Measure	No PSE N = 3520			PSE N = 353		
Arrested within one year of instant prison release						
False	51%	(1782)		61%	(214)	
True	49%	(1738)		39%	(139)	
Biological sex						
Female	12%	(414)		9%	(33)	
Male	88%	(3106)		91%	(320)	
Race						
Black	9%	(317)		12%	(41)	
Other	10%	(363)		9%	(33)	
White	81%	(2840)		79%	(279)	
Ethnicity						
Non-Hispanic	41%	(1447)		44%	(155)	
Hispanic	59%	(2073)		56%	(198)	
Age at first arrest	17.3	21.6	27.5	15.9	19.9	24.7
Year of instant prison admission						
1965-1996	3%	(105)		5%	(19)	
1997-2001	20%	(719)		41%	(146)	
2002-2005	77%	(2695)		53%	(188)	
Age at instant prison admission	24.9	30.9	38.7	21.8	26.6	32.4
Most serious offense leading to instant prison admission						
Other	5%	(176)		5%	(16)	
Person	25%	(883)		37%	(131)	
Property	30%	(1053)		28%	(98)	
Society/Drug	40%	(1408)		31%	(108)	
Maximum length of instant prison term [log(days)]	6.0	7.0	7.8	5.9	6.8	7.5
Number of minor infractions during instant prison term	0.0	0.0	0.9	0.0	0.0	1.0
Number of major infractions during instant prison term	0.0	0.0	0.0	0.0	0.0	0.7
Year of instant prison release						
2003	39%	(1375)		25%	(90)	
2004	33%	(1170)		35%	(124)	
2005	28%	(975)		39%	(139)	
Type of instant prison release						
Discharge	22%	(789)		12%	(43)	
Other	1%	(46)		0%	(1)	
Parole	76%	(2686)		88%	(309)	
Length of instant prison stay [log(days)]	5.1	6.0	6.9	5.3	6.1	6.8
Arrests for any offense prior to instant prison term	2.9	5.4	9.4	2.0	3.7	6.6
Arrests for person offenses prior to instant prison term	0.0	0.0	1.4	0.0	0.7	1.5
Arrests for property offenses prior to instant prison term	0.0	1.2	3.5	0.0	0.9	2.5
Arrests for social order offenses prior to instant prison term	0.0	1.0	2.4	0.0	0.8	1.7
Arrests for other offenses prior to instant prison term	0.0	1.2	2.8	0.0	0.8	1.5
Prior arrests per year	0.1	0.2	0.3	0.1	0.1	0.2

*a b c* represent the lower quartile *a*, the median *b*, and the upper quartile *c* for continuous variables. Numbers in parentheses are frequencies.

**Table 12. New Mexico: Study Group Balance After Propensity Score Weighting**

Measure	<i>d</i>	<i>p</i>	V. Ratio	<i>KS</i>	<i>p</i>
Biological sex	-0.037	0.542	0.910	0.011	0.549
Ethnicity	0.029	0.617	1.008	0.014	0.642
Race					
Black	0.043	0.661	1.115	0.014	0.416
Other	0.023		1.065	0.007	0.696
White	-0.050		1.078	0.020	0.368
Most serious offense leading to instant prison admission					
Other	-0.006	0.961	0.971	0.001	0.928
Person	0.031		1.017	0.015	0.579
Property	-0.021		0.978	0.009	0.710
Society/Drug	-0.009		0.991	0.004	0.908
Age at instant prison admission	-0.018	0.765	1.003	0.023	0.966
Year of instant prison admission					
1965-1996	0.020	0.931	0.085	0.005	0.736
1997-2001	-0.012		0.996	0.006	0.836
2002-2005	0.002		1.000	0.001	0.963
Maximum length of instant prison term [log(days)]	0.021	0.734	0.649	0.027	0.959
Number of minor infractions during instant prison term	-0.014	0.795	0.750	0.009	0.997
Number of major infractions during instant prison term	-0.027	0.604	0.717	0.007	0.992
Length of instant prison stay [log(days)]	0.046	0.430	0.869	0.029	0.942
Age at instant prison release	-0.020	0.742	1.012	0.027	0.913
Type of instant prison release					
Discharge	-0.024	0.329	0.947	0.008	0.685
Other	-0.121		0.356	0.008	0.160
Parole	0.047		0.905	0.016	0.441
Year of instant prison release					
2003	-0.021	0.935	0.977	0.009	0.735
2004	0.006		1.004	0.003	0.919
2005	0.013		1.004	0.006	0.815
Age at first arrest	0.013	0.823	1.025	0.027	0.897
Prior arrests per year	-0.025	0.655	0.909	0.023	0.993
Arrests for any offense prior to instant prison term	-0.041	0.464	0.837	0.017	0.985
Arrests for person offenses prior to instant prison term	0.011	0.840	0.994	0.016	0.888
Arrests for property offenses prior to instant prison term	-0.007	0.894	0.916	0.018	0.912
Arrests for social order offenses prior to instant prison term	-0.011	0.845	0.736	0.019	0.822

Note: All statistics contrast the treatment group subjects with the propensity-weighted comparison group subjects.

*d* is the standardized mean difference effect size calculated as the difference in the group means divided by the treatment group standard deviation; values nearer zero indicate better balance. The associated *p* values for the *d* statistics appear in the adjacent column. Two-category measures (e.g., ethnicity) are summarized on one row since the statistics are identical (save for the sign of the effect size) for both categories. Measures with more than two categories are summarized (on the row for the first category) with an overall measure of the significance of the differences across all categories.

Variance ratio (V. Ratio) is the treatment group variance divided by the comparison group variance. Values nearer one indicate better balance.

*KS* is the two-sample Kolmogorov-Smirnov (*KS*) statistic testing the null hypothesis that the two groups were drawn from the same distribution. Values nearer zero indicate better balance, and the *p*-value of each test statistic appears in the adjacent column.

## Appendix F: Detailed Outcome Analysis by State

### Indiana

We estimated the base logistic regression model on the weighted sample and found that the effect of PSE participation on reincarceration was negative (i.e., the PSE subjects were less likely on average to be reincarcerated than the comparison subjects) and statistically significant ( $p < .10$ ) (see Table 13). When we allowed additional covariates to enter the model in a stepwise framework, the effect size was only slightly attenuated and it remained marginally significant. The effect sizes in Table 12 are logged odds ratios, and the distribution of logged odds ratios has a mean of zero and a standard deviation of approximately 1.83 (Lipsey and Wilson, 2001). The Indiana effect size from the stepwise model is  $-.77$ , which equates to  $-.42$  standard deviation units (i.e.,  $-.77/1.83 = -.42$ ), making it a medium-sized effect.

**Table 13. Indiana: Outcome Models**

Measure	Base		Step	
(Intercept)	-2.89***	(0.14)	-5.04*	(2.14)
Study group (PSE =1, non-PSE = 0)	-.80*	(0.38)	-0.77 <sup>†</sup>	(0.39)
Race:				
Other			-1.13	(1.50)
White			-0.57*	(0.28)
Most serious offense leading to instant prison admission:				
Person			0.83	(0.51)
Property			0.45	(0.49)
Social Order			-0.13	(0.52)
Age at instant prison admission ( <i>A</i> )			0.41**	(0.10)
Number of infractions during instant prison term			0.05 <sup>†</sup>	(0.03)
Age at instant prison release ( <i>B</i> )			-0.24*	(0.10)
Type of instant prison released:				
Parole			-2.25**	(0.79)
Probation			0.85	(0.57)
Reentry Program			-0.07	(0.67)
<i>A x B</i>			-0.00	(0.00)
N (cases in sample)	10440		10440	
ESS (N for analysis; sum of weighted individuals)	1405.76		1405.76	
AIC	274.20		256.18	
BIC	284.69		329.66	
Log <i>L</i>	-135.10		-114.09	

Standard errors in parentheses.

<sup>†</sup> significant at  $p < .10$ ; \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

ESS is the effective sample size as calculated using equation 6.

Step model was identified using a forward and backward stepwise procedure using AIC as a convergence criterion. All of the independent variables in Table 6 and their three-way interactions were considered for inclusion in the model.

## Massachusetts

When we estimated the logistic regression models using the Massachusetts data, the pattern of findings was similar to those obtained for Indiana. The base model, which included an intercept term and the PSE dummy variable, showed an effect that was negative and statistically significant (see Table 14). The stepwise model, which included several other significant covariates and interaction terms, showed a slightly attenuated negative effect size that remained statistically significant. The Massachusetts effect size from the stepwise model is  $-.78$ , which equates to  $-.43$  standard deviation units (i.e.,  $-.78/1.83 = -.43$ ), making it a medium-sized effect.

**Table 14. Massachusetts: Outcome Models**

Measure	Base		Step	
(Intercept)	-0.86***	(0.16)	3.45*	(1.49)
Study group (PSE = 1, non-PSE = 0)	-0.82**	(0.29)	-0.78*	(0.33)
Ethnicity (Hispanic = 1, non-Hispanic = 0)			-0.32	(0.55)
Race:				
Other (A)			1.65	(4.44)
White (B)			-3.95*	(1.67)
Age at instant prison release (C)			-0.14***	(0.04)
Type of instant prison release (Parole = 1, Discharge = 0)			-0.57 <sup>†</sup>	(0.33)
Year of instant prison release:				
2004 (D)			0.15	(0.66)
2005 (E)			-0.28	(0.68)
Prior arrests per year			4.48**	(1.62)
Arrests for any offense prior to instant prison term			-0.08 <sup>†</sup>	(0.05)
Arrests for property offenses prior to instant prison term			0.07 <sup>†</sup>	(0.04)
A x C			-0.14	(0.18)
B x C			0.11*	(0.04)
A x D			7.75 <sup>†</sup>	(4.09)
B x D			0.60	(0.81)
A x E			-10.61	(982.17)
B x E			0.32	(0.84)
N (cases in sample)	1407		1407	
ESS (N for analysis; sum of weighted individuals)	318.09		318.09	
AIC	252.62		224.55	
BIC	260.15		292.27	
Log L	-124.31		-94.27	

Standard errors in parentheses.

<sup>†</sup> significant at  $p < .10$ ; \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

ESS is the effective sample size as calculated using equation 6.

Step model was identified using a forward and backward stepwise procedure using AIC as a convergence criterion. All of the independent variables in Table 9 and their three-way interactions were considered for inclusion in the model.

## ***New Mexico***

The base logistic regression model showed a small negative effect of PSE participation (-.23) but was marginally statistically significant (see Table 15). The stepwise model, which allowed many additional effects to enter the model, including some that were highly significant, showed a substantially larger, negative and significant estimate (-1.00) of the effect of PSE. The New Mexico effect size from the stepwise model is -1.00, which equates to -.55 standard deviation units (i.e.,  $-1.00/1.83 = -.55$ ), making it, as was the case for Indiana and Massachusetts, a medium-sized effect.

**Table 15. New Mexico: Outcome Models**

Measure	Base		Step	
(Intercept)	-0.20***	(0.06)	-4.05	(3.62)
Study group (PSE =1, non-PSE = 0) (A)	-0.23 <sup>†</sup>	(0.12)	-1.00*	(0.46)
Biological sex (Male = 1, Female = 0)			0.62**	(0.19)
Ethnicity (Hispanic = 1, non-Hispanic = 0)			0.36**	(0.13)
Race:				
Other (B)			-0.68	(0.82)
White (C)			0.34	(0.59)
Age at instant prison admission			-0.11*	(0.05)
Maximum length of instant prison term [log(days)] (D)			1.04 <sup>†</sup>	(0.55)
Number of minor infractions during instant prison term (E)			0.12**	(0.04)
Number of major infractions during instant prison term (F)			0.10 <sup>†</sup>	(0.05)
Length of instant prison stay [log(days)] (G)			0.23	(0.49)
Age at instant prison release (H)			0.05	(0.05)
Type of instant prison release:				
Other (I)			-3.70	(2.27)
Parole (J)			-1.79*	(0.71)
Age at first arrest (K)			0.04	(0.02)
Prior arrests per year (L)			5.95***	(1.04)
Arrests for person offenses prior to instant prison term (M)			-0.03	(0.05)
Arrests for property offenses prior to instant prison term (N)			0.52*	(0.21)
Arrests for social order offenses prior to instant prison term (O)			-0.15**	(0.05)
L x N			-0.42**	(0.12)
F x L			-0.35 <sup>†</sup>	(0.18)
H x I			0.11 <sup>†</sup>	(0.06)
H x J			0.06**	(0.02)
A x B			1.58**	(0.59)
A x C			0.36	(0.42)
D x N			-0.05*	(0.03)
E x M			-0.04*	(0.02)
B x K			0.00	(0.03)
C x K			-0.04 <sup>†</sup>	(0.02)
A x L			1.76 <sup>†</sup>	(1.05)
D x G			-0.12	(0.08)
N x O			0.01	(0.01)
N (cases in sample)	3873		3873	
ESS (N for analysis; sum of weighted individuals)	1682.00		1682.00	
AIC	2013.70		1862.65	
BIC	2024.56		2036.34	
Log L	-1004.85		-899.32	

Standard errors in parentheses.

<sup>†</sup> significant at  $p < .10$ ; \*  $p < .05$ ; \*\*  $p < .01$ ; \*\*\*  $p < .001$

ESS is the effective sample size as calculated using equation 6.

Step model was identified using a forward and backward stepwise procedure using AIC as a convergence criterion. All of the independent variables in Table 12 and their three-way interactions were considered for inclusion in the model.