An Evaluation of the Institution/Community Work Crew **Affordable Homes Program**

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EXECUTIVE SUMMARY

The Affordable Homes Program (AHP) is a prison work crew program managed by the Minnesota Department of Corrections (DOC). In coordination with local non-profit agencies, AHP trains offenders in the construction trade while they are serving time in prison. The hands-on training provided in AHP is designed to help offenders find post-release employment in the construction industry by cultivating positive work habits and marketable job skills.

AHP participants are placed in 5 to 11-man work crews and are tasked with the job of building or remodeling affordable homes throughout Minnesota. Supplied with a van and tool trailer, each work crew typically works four 10-hour days per week and is supervised by a DOC employee who is a master tradesman. While working on a project, the offenders are housed close to their work sites in minimum-security units at local correctional facilities; e.g., county jails.

AHP began in 1998 with approximately 10 offenders and, in 2010, has grown to approximately 45 offenders participating in the program at any given time. This report presents the results of a rigorous outcome evaluation of AHP since its beginning in 1998. In doing so, this study addressed four main questions:

1. Does AHP increase the number of affordable homes in Minnesota?
2. Does AHP impact post-release employment?
3. Does AHP reduce costs?
4. Does AHP reduce offender recidivism?

Does AHP increase the number of affordable homes in Minnesota?

From 1998 to 2007, AHP financed and/or constructed more than 285 new homes, renovated at least 60 existing homes, and repaired approximately 60 homes for senior citizens and flood victims after the 1997-1998 Red River flood season. The average cost of these homes was $102,231 and the average income was $30,353. Each year, AHP participants built 29 homes, on average.

And AHP continues to build. In February 2010, crews broke ground on two buildings of supportive housing for veterans in Duluth, Minnesota; the project includes 11 units of permanent

and 6 units of transitional housing. One could conclude that AHP has and continues to substantially increase the number of affordable homes in Minnesota.

Does AHP impact post-release employment?

The results of the post-release employment analyses revealed that AHP participants did have significantly higher odds of gaining employment in a construction-related field (i.e., 2.62 times greater odds for program completers and 2.42 times greater for all participants,) than members of the comparison group but did not have significantly higher odds of gaining employment in "any field."

Does AHP reduce costs?

The cost-benefit analysis examined five areas in which AHP could reduce costs to the State of Minnesota and local non-profit agencies. The results of this analysis showed that the costs avoided by the State of Minnesota totaled $13.1 million, which amounts to $58,492 per each offender participant. Put in other terms, for every dollar spent on AHP, the program has produced an estimated benefit of $61.90.

Does AHP reduce offender recidivism?

The results of the recidivism analyses revealed that, controlling for other factors, participation in AHP did not have a statistically significant impact on reoffending. In line with what other studies have reported, the results showed that offenders who were younger, were minorities, had more previous prison commitments, were property offenders, were chemically dependent, or had a greater number of prior supervised release revocations experienced a significantly increased risk of recidivism (for at least one of the three measures). The risk of reoffending was lower, however, for offenders who were released to supervision.

The findings also showed that program outcome (completion or termination) did not have a significant effect on recidivism. However, the results of the interaction analyses suggest that that AHP worked better for certain offenders. For example, completing the program had a greater impact on property offenders than drug offenders. Conversely, the program did not appear to be as effective for supervision violators as for offenders who had more prior prison commitments.

Summary

AHP was designed to increase affordable housing, increase post-release employment, and reduce costs to the state. From 1998 to 2007, AHP built 285 affordable homes, increased offenders' odds of obtaining post-release employment in the construction field, and produced $13.1 million of costs avoided to the State of Minnesota. By these measures, AHP has done exactly what it was designed to do and, in doing so, has been an effective correctional program.

INTRODUCTION

The Affordable Homes Program (AHP) is a prison work crew program managed by the Minnesota Department of Corrections (DOC). The program trains offenders in the construction trade while they are serving time in prison. AHP began in 1998 with approximately 10 offenders and, in 2010, has grown to approximately 45 offenders participating in the program at any given time. Teams of offenders work in coordination with local non-profit agencies to build or remodel low-income homes in the state of Minnesota. There are two "key objectives" to the program. First, the program must increase affordable housing in Minnesota. Second, the program must provide occupational skills that offenders can later market to employers, allaying the challenges of obtaining post-release employment. This study also explored two additional "research objectives": whether the program was able to reduce costs to the State of Minnesota or decrease recidivism rates.

Utilizing three data sources (Minnesota Department of Employee and Economic Development, Minnesota Bureau of Criminal Apprehension, and the DOC's Correctional Operations Management System database) to obtain four main types of data (demographic, post-release employment, recidivism, and program financial records), this report addressed whether AHP was able to increase affordable housing and post-release employment, reduce costs to the State of Minnesota, and decrease recidivism rates. This study improved on prior investigations in several important ways.

First, previous studies have examined multi-component programs that have provided several services to offenders and, as a result, have been unable to isolate the independent effect of the vocational program being evaluated. AHP is a unique vocational program in that it provides construction training skills to offenders apart from other types of programming found in vocational programs previously evaluated. This allowed the independent effect of the AHP program to be isolated.

Second, compared to prior studies, this evaluation has a broader scope. Most previous studies have examined either post-release employment or recidivism. This study included both, as well as a third, skill-specific outcome measure: construction-related employment. Further, the study also incorporated a cost-benefit component that is lacking in all but one previous systematic review (Aos, Miller and Drake, 2000b). Finally, the study also included information on the number of affordable homes built by the program.

Third, this study utilized a quasi-experimental design and attempted to control for selection bias. Unlike previous studies that have used previously existing groups for comparison, the groups in this study were matched on a relatively large set of covariates; this is an improvement that provides greater confidence in this study's findings.

Literature Review

State-run prison work crews

A review of the research literature indicated that, nationwide, there are at least two state-run prison work crew programs that operate similarly to Minnesota's home-building program. The two states, Michigan and Texas, provide offenders with opportunities to gain construction skills through partnerships with Habitat for Humanity and Prison Partnership. Participants in these programs are allowed to leave prison to build homes for low-income families. Although not targeted at honing specific job skills, at least eight other states (California, Indiana[1], Kansas[2], New York (Bloom, Redcross, Zweig, and Azurdia, 2007) North Carolina[3], Oregon[4], Washington[5] and Wyoming) operate prison work crews that are designed to develop in offenders a general work ethic.

The intent of most of these programs is to minimize or offset prison operation costs to taxpayers by utilizing inmate labor to perform other state-funded tasks such as park maintenance and disaster relief. For example, the California Department of Corrections and Rehabilitation operates a prison work crew program that is trained to assist in fire suppression and other natural emergencies such as floods and earthquakes. These crews also work on statewide public land conservation projects and assist with local community service projects[6]. Although state-run prison work crew programs that are similar in scope to AHP exist, there are currently no published evaluations of these programs.

Prison-based vocational training

[1] Indiana Department of Corrections (March 22, 2010). Retrieved from http://www.in.gov/idoc/
[2] Kansas Department of Corrections (March 22, 2010). Retrieved from http://www.doc.ks.gov/
[3] North Carolina Department of Correction, Putting Inmates to Work (March 22, 2010). Retrieved from http://www.doc.state.nc.us/WORK/
[4] Oregon DOC Operations Division, Inmate Work Crew Information (March 22, 2010). Retrieved from http://www.oregon.gov/DOC/OPS/PRISON/crci_workcrew.shtml
[5] Washington State Department of Corrections, Offender Crews (March 22, 2010). Retrieved from http://www.doc.wa.gov/aboutdoc/offendercrews.asp.
[6] California Department of Corrections and Rehabilitation, Conservation Camps (March 22, 2010). Retrieved from http://www.cdcr.ca.gov/Conservation_Camps/index.html.

Several published evaluations have been completed on programs similar to AHP, such as prison-based vocational training and prison industry programs. Prison-based vocational training programs are analogous to attending a vocational or technical college to earn certification in a specific trade, such as carpentry or computer repair, whereas prison industry programs provide an experience similar to working on a factory line (e.g., sewing uniforms, manufacturing license plates, assembling a variety of products, cutting pieces of wood for cabinet makers, etc.). In prison industry programs, the main objective is to produce a product. Inmates may or may not learn a new skill along the way but there is not an explicit goal to gain mastery (or certification) in a trade. For this reason, AHP is more closely aligned with the goal of prison-based vocational programs, which is to provide training that prepares individuals for employment in specific jobs or industries. In the case of AHP, the industry is construction.

Participation in prison-based vocational training is similar in scope to prison work crew programs such as AHP. For example, both programs provide job skills to offenders while they are serving time in prison. AHP is different from other vocational training programs, however, in three important ways. First, the main difference between the two programs is that vocational programs, although able to award certification in a trade, lack the on-the-job training that AHP is able to provide to offenders. AHP has a narrow focus in that it provides experiential, hands-on training exclusively in the construction trade. There is no formal classroom-based instruction, and AHP does not provide certification in the construction trade. Prison-based vocational programs provide in-depth classroom-based training in a broader range of vocational skills such as electrical, painting, cosmetology, carpentry, computer repair, welding, etc. Second, AHP serves only felony-level offenders who have been sentenced to prison, whereas many of the vocational programs evaluated nationwide have incorporated lower-risk offenders who were on probation or serving jail sentences for less severe offenses. Third, offenders in AHP are housed in county jails where they can more easily travel to the communities in which they will be working for the day. Vocational programs are housed wholly in the prison or jail from which they operate.

Results of previous research on prison-based vocational programs

Of the studies conducted on prison-based vocational training, almost all have examined recidivism, a few have examined legitimate labor market participation and wages, and at least one has conducted a cost-benefit analysis (Aos, Miller and Drake, 2006b). Although plagued by methodological limitations (Wilson, Gallagher, and MacKenzie, 2000), the results from this body of research have been promising. Despite a lack of agreement among scholars regarding the size of the program effect (Gaes, 2008), many of the studies, meta-analyses, and other reviews have found that vocational programs increased employment and decreased recidivism (Aos, Miller and Drake, 2006a; MacKenzie, 2000; Seiter and Kadela, 2003).

The two studies completed by Saylor and Gaes (1992, 1997), which evaluated both post-release employment and recidivism over a four-year period, are notable due to their methodological rigor. Data were collected on more than 7,000 federal offenders, comparing those participating in training and work programs with similar non-participant offenders and with a baseline group of all other inmates. The results of this longitudinal study demonstrated an increase in post-release employment as well as a significant reduction in both in-prison (misconduct reports) and post-prison recidivism measures (arrest rates).

At least three meta-analyses have been completed that have reviewed the findings from prior evaluations of prison-based vocational programs. Reviewing the two studies by Saylor and Gaes (1992, 1997), along with five additional evaluations of vocational and work release programs, Seiter and Kadela (2003) reported that the programs were effective in improving job readiness skills for offenders as well as in reducing recidivism. Similarly, in reviewing evaluations of three prison-based vocational programs, Aos, Miller and Drake (2006a) found that the three programs collectively produced a 12.6 percent reduction in offender recidivism. In her meta-analysis, MacKenzie (2000) also concluded that the results from previous research suggest that vocational programs effectively reduce recidivism.

In their cost-benefit analysis of alternatives to imprisonment, Aos, Miller, and Drake (2006b) reported that vocational programming produced substantial savings to the State of Washington. In monetizing the costs and benefits of vocational programming, Aos and colleagues incorporated the costs of each program, benefits to crime victims, and benefits to taxpayers. They found that the nine percent reduction in recidivism created by vocational programming translated to a benefit of $13,738 for each offender participant.

Tempering these encouraging findings, however, is the fact that, as noted previously, prior evaluations of prison-based vocational programs have generally been limited in several ways. First, because most evaluations have used naturally occurring nonparticipants from the vocational program of interest as a comparison group, selection bias is an issue that plagues much of the research. Selection bias refers to differences—both observable and unobservable—between the treated and untreated groups that make it difficult to determine whether the observed effects are due to the treatment itself or to the different group compositions. Therefore, although previous evaluations have found that recidivism rates are generally reduced for offenders who participate in vocational programming, this effect may not necessarily be due to the programming itself but rather to other differences between treated and untreated offenders. Second, MacKenzie (2008) argues that the majority of studies have evaluated programs that were too comprehensive in that they incorporated chemical dependency treatment or employment-assistance programs in addition to the vocational training. Because the components of each program varied greatly, it is difficult to isolate the effect of the vocational training on post-release employment or recidivism.

Due to these limitations, the magnitude of the effect of vocational programming on post-release employment and recidivism remains uncertain. This study improves upon previous studies in the following ways. The present study utilizes thorough post-hoc matching techniques, on a broad spectrum of variables, in an attempt to address the concerns presented by sample selection artifacts. Also, because AHP is singularly focused on training offenders in the construction trade, this study is uniquely positioned to examine the isolated effect of vocational training apart from confounds that have plagued other studies.

The Present Study

This report presents the results of a rigorous outcome evaluation of AHP since its beginning in 1998. In doing so, this study addressed four main questions:

1. Does AHP increase the number of affordable homes in Minnesota?
2. Does AHP impact post-release employment?
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PROGRAM DESCRIPTION

The Institution/Community Work Crew

The Institution/Community Work Crew (ICWC) is a project of the DOC that provides work opportunities in Minnesota communities for a select number of minimum-custody offenders. ICWC began in the spring of 1995 with one crew of approximately 10 inmates and has since grown to roughly five crews with up to 45 inmates. Crews work on a variety of projects, including construction and demolition, trail and waterway development, flood and storm damage control, forestry work, golf course and building maintenance, land restoration, and highway clean-up. Work projects are arranged through community partnerships with various city governments, park departments, non-profit environmental groups, and public facilities. These partnerships provide funding to offset the cost of the ICWC program to the State of Minnesota.

The Affordable Homes Program

In 1998, the Affordable Homes Program (AHP), a program within ICWC, was established using a $700,000 legislative appropriation to build affordable houses for low-income families. Newly-built homes were targeted to sell to households earning 80 percent or less of the statewide median income, adjusted for family size, in an effort to address the low-income housing shortage. AHP formed partnerships with several community-action agencies, housing and redevelopment authorities, and economic development agencies that made it possible to build homes at affordable costs. Together, the agencies developed projects, found construction sites, marketed the homes, and assisted buyers in qualifying to purchase the homes. This program was designed to simulate "real world" job experience for offenders. The hands-on training provided in AHP is designed to help offenders develop positive work habits and marketable job skills intended to aid offenders in obtaining employment in the construction industry upon release from prison.

To be eligible for AHP, adult male offenders must: 1) be minimum security, 2) have no untried misdemeanor, gross misdemeanor, or felony detainers, 3) have no escapes in the past five years, 4) have no current or prior criminal sexual conduct offenses, 5) have no discipline violations in the past six months resulting in segregation and/or extended incarceration, 6) not be

considered a risk to the community, 7) demonstrate a positive attitude, and 8) be physically capable of performing the work. Eligible offenders who are selected to participate are then placed in a work crew with up to nine other offenders. These crews are housed in minimum-security units at local correctional facilities; e.g., county jails. Work crews typically work four 10-hour days per week and are supervised by a DOC employee who is a master tradesman. Each crew is supplied with a van for transportation and a trailer that contains their tools.

Participating in the program is not rewarded with a shortened prison sentence or a reduction in time served. Instead, offenders are paid an hourly wage that ranges from $1 to $1.50. Monies earned are deposited into institution inmate accounts. These funds are then used to pay restitution, applied toward gate (release) money, or saved in an account to assist offenders when they are released to the community.

Once selected to participate in the program, offenders progress through four different levels within AHP. As offenders graduate to higher levels they receive higher pay, the ability to leave the jail facility for supervised and eventually unsupervised leaves, and receive reentry assistance (e.g., education, employment, housing and aftercare). At all four levels, there is no holiday pay, overtime, or medical leave. There is pay reduction for offenders not working up to their potential as determined by the crew leader. If the offender chooses to abscond while working on the program, he will be charged with a felony escape from custody and become a program failure, which will lead to more severe consequences during the remainder of his stay in prison.

Most offenders transition from AHP to work release, where they can earn a regular paycheck while employed at companies in their communities. Offenders are eligible for work release when they have less than eight months remaining before their scheduled release from prison.

RESEARCH QUESTION #1: DOES AHP INCREASE AFFORDABLE HOUSING?

During the first 10 years of its operation, approximately 350 offenders participated in AHP. In its earlier years, there were up to ten crews running simultaneously. However, in response to the recent slowdown in the housing market, today the DOC operates a smaller number. For example, as of July 1, 2010, there were 39 AHP participants (5 crews) working on

construction of new affordable single-family homes and extensive remodeling of substandard and foreclosed existing homes.

As shown in Table 1, from 1998 to 2007, AHP financed and/or constructed more than 285 new homes, renovated at least 60 existing homes, and repaired approximately 60 homes for senior citizens and flood victims after the 1997-1998 Red River flood season. The average cost of newly-constructed homes was $102,231. Each year, on average, 29 of these homes were sold to families comprised of 2 to 4 members whose income was $30,353 on average.

And AHP continues to build. In February 2010, crews broke ground on two buildings of supportive housing for veterans in Duluth, Minnesota; the project includes 11 units of permanent and 6 units of transitional housing. One could conclude that AHP has and continues to substantially increase the number of affordable homes in Minnesota.

Table 1. Summary Information for Homes Built by the Affordable Homes Program, 1998- 2007

Year	Average Cost of Home	Average Family Size	Average Annual Income	Total Homes Built
1998	$62,000	2.4	$25,390	8
1999	$64,300	3.0	$30,791	10
2000	$78,770	2.0	$28,326	25
2001	$91,714	2.9	$28,025	38
2002	$101,417	2.5	$32,651	33
2003	$109,285	2.1	$30,687	34
2004	$127,748	2.5	$34,641	44
2005	$151,689	3.2	$36,470	32
2006	$133,154	4.0	$26,196	32
2007	n/a	n/a	n/a	29
Average	$102,231	2.7	$30,353	29
Total				285

DATA AND METHODS

The present study used a retrospective quasi-experimental design to compare the AHP participants with a comparison group of similar offenders who did not participate in AHP. Initially, this study examined all offenders who participated in AHP from the time the program began, April, 1998, through the end of December 2005. During this time, there were 224 offenders who participated in AHP and were released to the community on or before December 31, 2005. Similarly, the population from which the comparison group was selected consisted of

4,540 offenders who were released from a Minnesota correctional facility within a similar timeframe, January 1, 1998 – December 31, 2005. To make the comparison between the AHP and comparison groups as even as possible, releases for both groups were defined as the first instance in which they exited prison and were placed on some form of supervision such as supervised release or work release. The final sample selection of 224 AHP participants and 224 similar comparison group members was achieved using propensity score matching and is described later in this section.

Data for this study were gathered from several sources. Each source will be discussed in conjunction with the measures it provided.

Outcome Measures

Post-release employment and recidivism were the outcome measures used in this study. Employment and recidivism data were collected on offenders from both the AHP and comparison groups through the end of 2008. The average follow-up period for the offenders examined in this study was 5.9 years, with a minimum of three years and a maximum of ten.

Post-Release Employment

This study used the following four measures of post-release employment: 1) whether the offender obtained employment, 2) the total number of quarters the offender was employed after release from prison, 3) the total number of hours an offender was employed, and 4) the amount of money an offender earned during employment. Data on post-release employment were obtained from the Minnesota Department of Employee and Economic Development (DEED). Any labor (or compensation for that labor) not reported to DEED will not be captured in the analyses.

Post-release employment data were not available from April 1998 through December 2004. Because 371 of the 448 offenders in the sample were released from prison during this time period, complete work histories were not available for all offenders. To compensate for these limitations and to gain as thorough a work history as possible, all employment data available after January 2005 were utilized. Therefore, the time-frame for the post-release employment portion of the study began in January 2005 and ran through the end of March 2009—instead of terminating in December as was the case with the recidivism portion of this study.

To ensure that the work histories for each offender could be accurately compared to each other, the following steps were taken. The employment history for each offender began on the latter of two dates, either January 1, 2005, or the offender's release date, and ended on March 31, 2009. If an offender was in prison during this time frame, the time he spent in prison was subtracted from his total time in the community. In this manner, a maximum of 17 quarters of employment history was examined for each offender—less time if the offender spent any time in prison for supervision revocations or reincarceration events. Because it was possible that each offender spent a different number of days in the community, the amount of time he worked was divided by the amount of time he was in the community to create a "proportion of time employed" measure. In this way, an offender who spent five years in the community and was employed for three years could be compared to an offender who was in the community only two years and employed the whole time. Three of the four post-release employment variables were calculated as described above: quarters employed, hours worked, and wages earned. The fourth measure, whether an offender obtained employment, was not calculated to take time in community into consideration. However, in the analyses in which this variable was the outcome variable, a control variable was used that measured the amount of time an offender was in the community prior to 2005.

Recidivism

This study used three measures of recidivism. In particular, recidivism was operationalized as an arrest for a new crime (i.e., rearrest); a felony conviction (i.e., reconviction); and a return to prison for a new criminal offense (i.e., reincarceration). Data on rearrests and reconvictions were obtained electronically from the Minnesota Bureau of Criminal Apprehension (BCA), whereas reincarceration data were derived from the DOC's Correctional Operations Management System (COMS) database. The main limitation with using these data was that they measured only felony convictions or incarcerations that took place in Minnesota. Because neither source included arrests, convictions, or incarcerations occurring in other states, the findings presented later likely underestimated the true rearrest, reconviction, and reincarceration rates for the offenders examined. Still, there is little reason to believe that the omission of these data affected offenders in the AHP group more than those in the comparison group, and vice versa.

To accurately measure the amount of time that offenders were actually at risk to recidivate (i.e., their "street time"), it was necessary to account for supervised release violators in the recidivism analyses by deducting the amount of time spent in prison from their total at-risk period. Failure to deduct time spent in prison as a supervised release violator would artificially increase the length of the at-risk periods for these offenders. Therefore, the time that an offender spent in prison as a supervised release violator was subtracted from his/her at-risk period, but only if it preceded a recidivism event (e.g., rearrest, reconviction, or reincarceration) or if the offender did not recidivate.

Independent Variables

The principal variable of interest was AHP participation because the central purpose of these analyses was to determine whether AHP had a significant impact on post-release employment or recidivism. This study provided two different measures of AHP participation. The first measure distinguished between offenders who entered AHP (i.e., the programming group) and those who did not (i.e., the comparison group). The second measure divided AHP participants into two discrete categories: program completion and program termination. Of the 224 offenders who participated in AHP between 1998 and 2005, 146 offenders (65 percent) completed the program and 78 were terminated from the program. There are a variety of reasons why offenders were terminated from the program, ranging from medical limitations to disciplinary action. However, for the purposes of this study, all terminations were grouped together. For both participation measures, the comparison group variable served as the reference in the statistical analyses.

The control variables included in the statistical model consisted of those that might theoretically have impacted whether an offender recidivated and, thus, might be considered a rival causal factor. The following lists the control variables used in this study and describes how they were created:

Offender Race: dichotomized as white (1) or minority (0).

Age at Release: the age of the offender in years at the time of release based on the date of birth and release date.

County of Commit: this variable measured an offender's county of commitment, dichotomizing it into either metro area (1) or Greater Minnesota (0). The seven metro-area counties include Anoka, Carver, Dakota, Hennepin, Ramsey, Scott, and Washington. The remaining 80 counties were coded as non-metro area or Greater Minnesota counties.

Prior Criminal History: the number of prior prison commitments, excluding the offender's current prison incarceration, resulting from new commitments and not from supervision revocations.

Institution Disciplinary History: the number of discipline convictions received during the term of imprisonment for which the offender was released, but only for convictions occurring after the admission date and within 18 months of the release date.

Length of Stay (LOS): the number of months between admission and release dates.

Offense Type: four dichotomous dummy variables were created to quantify offense type; i.e., the governing offense at the time of release. The four variables were person offense (1= person offense, 0 = non-person offense); property offense (1 = property offense, 0 = non-property offense); drug offense (1 = drug offense, 0 = non-drug offense); and other offense (1 = other offense, 0 = non-other offenses). The "other" offense variable included methamphetamine-related offenses, driving while intoxicated, and other miscellaneous offenses. The "person" offense variable served as the reference in the statistical analyses.

Chemical Dependency Treatment History: two dichotomous variables were used to measure whether an offender was diagnosed with some type of chemical dependency (at admission or during a prior admission to prison) and whether the offender successfully completed some type of chemical dependency treatment, or

participated in the program, until release from prison. The first variable was chemical dependency diagnosis (1= an offender received a chemical dependency diagnosis prior to 18 months before release, 0 = no). The second variable was successful completion of treatment (1= successfully completed treatment or participated until release, 0 = did not participate until release or did not successfully complete treatment).

Length of Post-Release Supervision: the number of months between release date for current incarceration and expiration of sentence.

Intensity of Post-Release Supervision: four dichotomous dummy variables were created to measure the level of post-release supervision to which offenders were released. The four variables were supervised release (1= supervised release, 0 = all other types); work release (1= work release, 0 = all other types); Challenge Incarceration Program (CIP) or Intensive Supervised Release (ISR) (1= release to CIP or ISR, 0 = all other types of release); and discharge (1= released at expiration of sentence, 0= all other types of release).

Prior Supervised Release Revocations: number of supervised release revocations that occurred prior to current incarceration.

Release Year: measured the calendar year in which offenders were first released from prison for the current offense; this variable was included to control for any unobserved differences between the different release-year cohorts.

Sample Selection

Sample selection bias results when characteristics of the offenders (e.g., motivation or self-control) influence whether offenders are assigned to either the AHP group or to the comparison group. When sample selection bias occurs, researchers cannot be confident that any changes observed in the outcome variable are the result of the intervention or whether the

observed changes could be related to other extraneous factors (e.g., age, race, motivation) that could theoretically impact the research outcomes.

Randomization, especially as implemented in a randomized controlled design, is the ideal tool utilized by researchers to minimize the risk of sample selection bias. "[R]andomization tends to eliminate the influence of extraneous factors not under the direct control of the experimenter and thereby precludes the presence of selection bias (Kutner, Nachtsheim, Neter, and Li, 2005, p.653)." However, in retrospective studies, such as this one, because randomization was not built into the original research design, there are not pre-established control and treatment groups. It is highly probable that individuals selected themselves into AHP based on similar characteristics—such as age, health, enjoyment of tactical work—but that these characteristics could be largely unknown to the researcher.

When it is not possible to conduct a randomized experiment, a propensity score matching design can be used to carefully select a comparison group that is as similar to the AHP group as possible by matching offenders. This is the design that was utilized for this project.

The propensity score matching technique provides a means of adjusting for selection bias in observational studies of causal effects. After collecting background (covariate) information regarding who participated in AHP and who did not, the probability of having been selected into AHP given one's background information (i.e., covariate pattern) can be calculated. This probability is called a propensity score. Using this technique, each offender has a unique propensity score, or a numerical probability of being selected into AHP. Offenders who participated in AHP were matched one-to-one with offenders from the pool of comparison group members on the basis of having similar propensity scores. The result is that each AHP group member has a corresponding comparison group member who has a similar probability of being selected to participate in AHP—the only difference is that one offender participated in AHP and the other did not. Therefore, this matching technique approximated randomization such that each member of the sample had a similar probability of being selected into AHP. As with any non-randomized design, the main limitation of this technique was that it could only control for the background factors that were measured, and then only as well as the instruments that measured those factors. That is to say, propensity score matching could not control for omitted variable bias. However, this is mainly a concern when the omitted variables—those not included

in and thereby not controlled for—in the model are associated with AHP selection or the outcome measures.

The first step in the propensity score matching technique was to construct the AHP group. There were 414 male offenders who entered AHP between April 1998 and December 2005. Of these 414, only 229 exited the program and were released from prison prior to the cut-off date of December 31, 2005. Utilizing this cut-off date ensured a sufficient follow-up period of at least three years for all members of the sample. The treatment group was further reduced to 224 offenders due to five who were missing either social security number information, which was needed to access DEED data, or state identification numbers, which were required to obtain criminal history information from the BCA.

The first step in assembling the comparison group was to isolate the offenders who did not participate in AHP but who were released to the community between January 1, 1998, and December 31, 2005, a similar release timeframe as the AHP group. During this timeframe, there were 44,731 releases from Minnesota prisons. Next, offenders who would not have been eligible to participate in AHP were removed from the sample. Since the program is currently only available to males, this meant that all female offenders were removed. Further, in accordance with the DOC criteria for participation in AHP, offenders were excluded if they: were not within 18-48 months of their supervised release date; had a mandatory placement on ISR or a current criminal sexual conduct offense; had any escapes from prison within the past five years; had untried misdemeanor, gross misdemeanor, or felony detainers or tried detainers that were set to expire after the term of imprisonment; or had pending criminal charges or holds for other jurisdictions. There were 6,174 releases, or 4,994 distinct individuals, that qualified for inclusion in the comparison sample after these steps were taken.

There were other eligibility criteria that were not used to eliminate offenders from the comparison group because these requirements were difficult to operationalize using available data. These criteria included demonstrating a positive attitude, being physically capable of work, having a low security status at the time of application, being discipline-free for six months, and not having any prior criminal sexual conduct offenses.

Once it was established that the comparison group members met the criteria to participate in AHP as best could be approximated, the propensity score matching technique was used to select the 224 comparison group members who most closely matched the 224 AHP group

members based on the control variables used in the post-release employment and recidivism analyses.

One final note is that offenders applied to AHP 18 months prior to their release date. It is at this point that offenders entered AHP. Therefore, any behavior after this time point (18 months prior to release) was considered to be influenced by group membership (i.e., the main outcome variable) and could not be used to select members into either the AHP or comparison group. Therefore, institution discipline records, or any other criteria utilized in the matching process, must have occurred greater than 18 months prior to the release date in order to have eliminated offenders from inclusion in the sample pool.

Descriptives

As shown in Table 2, the propensity-score matching technique was effective in producing a comparison group that is equivalent to the AHP group with respect to the control variables used in the post-release employment and recidivism analyses.

Table 2. Descriptives, Before and After Propensity Score Matching

Measure	AHP Participants	Comparison Group Before Matching		Comparison Group After Matching	
	Mean/Percent	Mean/Percent	P-Value	Mean/Percent	P-Value
Race/Ethnicity					
White	73%	46%	0.000 ***	75%	0.592
Minority					
Age at Release	35.17	32.92	0.000 ***	35.26	0.911
County of Commit					
Metro	39%	63%	0.000 ***	40%	0.923
Non-Metro					
Prior Criminal History					
Number of Previous Prison Commitments	1.55	0.88	0.000 ***	1.59	0.771
Institutional Discipline History					
Number of Discipline Convictions, during first part of current stay	0.72	2.54	0.000 ***	0.81	0.527
Length of Stay, in months	31.07	35.35	0.017 *	31.11	0.983
Offense Type					
Person	12%	34%	0.000 ***	11%	0.882
Property	40%	22%	0.000 ***	41%	0.848
Drug	34%	31%	0.249	30%	0.365
Other	14%	13%	0.818	17%	0.299
Chemical Dependency Diagnosis, during first part of current stay	30%	38%	0.015 *	25%	0.292
Successfully Completed Treatment, during first part of current stay	16%	9%	0.009 **	17%	0.798
Length of Post-Release Supervision, in months	23.25	24.60	0.727	21.79	0.262
Intensity of Post-Release Supervision					
Supervised Release	37%	67%	0.000 ***	38%	0.771
Work Release	60%	23%	0.000 ***	60%	0.773
CIP and ISR	2%	6%	0.000 ***	1%	0.412
Discharge	1%	5%	0.000 ***	2%	0.412
Number of Supervised Release Revocations, prior to current stay	0.46	0.33	0.056	0.45	0.884
Release Year	2002.24	2001.82	0.003 **	2002.04	0.356
N	224	4540		224	

*p<.05 **p<.01 ***p<.001

Prior to the use of the propensity-score matching technique, the results from independent samples t-tests showed that there were significant differences between the two groups on almost all the control variables. However, after the matching process, there was not a significant difference between the two groups on any control variable.

Post-Release Employment and Recidivism Outcomes

The findings presented in Table 3 reveal that although AHP participants had significantly higher rates of post-release employment and hours worked, compared to those in the comparison

group, the differences were not statistically significant. For example, 71.9 percent of AHP participants obtained post-release employment whereas only 63.4 percent of comparison group members did so. Focusing on the subset of program completers, their rate of post-release employment was 14.7 percent higher than the comparison group. Likewise, this group worked 228.63 hours more, on average, and earned $3,351.15 more, on average, than the comparison group. However, among program terminations, the rate of post-release employment, average hours worked, and average wages earned were not only lower than the program completers but also lower than the comparison group members.

Table 3. Post-Release Employment and Recidivism Outcomes, by Group Type

Outcome Type	*Group Type*			
	Comparison Group	AHP Completion	AHP Termination	All AHP
Employment Outcomes				
Obtained Post-Release Employment				
Any Field	142 (63.4%)	114 (78.1%) **	47 (60.2%) *	161 (71.9%) †
Construction Field	38 (16.9%)	58 (39.7%) ***	14 (17.9%) **	72 (32.1%) ***
Average Hours Worked	466.04	694.67 **	414.89 †	597.25 *
Average Wages Earned	$7,457.59	$10,808.74 *	$6,128.75 †	$9,179.10
Recidvisim Outcomes				
Event That Ended Time at Risk				
Rearrest	146 (65.2%)	84 (57.5%) *	59 (75.6%) *	143 (63.8%)
Reconviction	95 (42.4%)	46 (31.5%) **	41 (52.5%) *	87 (38.8%)
Reincarceration -- New Commit	75 (33.5%)	33 (22.6%) **	32 (41.0%) *	65 (29.0%)
Reincarceration -- Any Reason	120 (53.5%)	63 (43.1%) **	50 (64.1%) *	113 (50.4%)
N	224	146	78	224

†p<.10, *p<.05, **p<.01, ***p<.001

Note: Results starred are significantly different than the comparison group

Looking at recidivism measures, a similar pattern emerges. The findings presented in Table 3 reveal that while AHP participants had lower recidivism rates than the comparison group for all four measures (i.e., rearrest, reconviction, reincarceration, and any return to prison), the differences were not statistically significant. Breaking out the AHP group into program completers and program terminations revealed a starker contrast with the comparison group. The rates for felony reconviction, reincarceration, and return to prison for any reason (i.e., including supervision revocations) were significantly lower for program completers than for comparison group members. For example, the rate of reconviction for program completers was 10.9 percentage points lower compared to the comparison group. Similarly, the rate of reincarceration

for a new crime rate was 10.9 percentage points lower and the rate of reincarceration was 10.4 percentage points lower for program completers. On the other hand, the rate of rearrest (75.6%) was significantly higher for program terminations than the rate of rearrest for comparison group members (65.2%).

Data Analysis

For the post-release employment analyses, logistic regression was used. Logistic regression is well suited to address dichotomous outcome measures in which the interest was in predicting the probability that an event would occur or for estimating the likelihood that, for example, an offender would obtain post-release employment or gain employment in a construction-related field.

Cox regression was used in the recidivism analyses. As a type of survival analysis, Cox regression is preferable in that it utilizes time-dependent data, which are important in determining not only *whether* offenders recidivate but also *when* they recidivate. To incorporate the time element with the event information, Cox regression utilizes both "time" and "status" variables in estimating the impact of the independent variables on recidivism outcomes. The "time" variable measures the amount of time from the date of release until the date of first rearrest, reconviction, reincarceration, or December 31, 2008, for those who did not recidivate. The "status" variable, on the other hand, is a dichotomous variable that measured whether one of the three recidivism variables mentioned above had occurred (i.e., rearrest, reconviction, reincarceration).

Cox regression was unable to be used for the post-release employment analyses for two reasons. First, there were not valid measures for the "time" variable; i.e., data were not able to indicate a specific employment start date. Second, ideally, the "time" variable would begin the day an offender is released from prison for all members of the sample. However, as discussed previously, because post-release employment data did not become available until January 2005, this was the earliest date employment information was available for 371 of the 448 offenders in the sample. This means that the majority of the sample had been left-truncated with regard to employment data, and Cox regression would not have been an appropriate analytical technique because it could not accurately predict the "timing" until the event of employment occurred.

RESEARCH QUESTION #2: DOES AHP IMPACT POST-RELEASE EMPLOYMENT?

AHP was designed to provide a specific set of skills to offenders—construction skills. Therefore, there was reason to believe that offenders who have participated in AHP, and who had gained construction experience, should have had greater odds of securing employment in construction-related fields such as plumbing, masonry, highway, bridge or street construction, installing drywall, or electrical work. Additionally, evaluations of vocational educational programs have shown that these programs effectively increase the employment rate of offenders (MacKenzie, 2008). Consistent with these findings, it was expected that AHP would increase post-release employment in "any field." To test both hypotheses, logistic regression was used to estimate the impact of AHP on post-release employment in both "construction-related" fields, as well as in "any field."

In Table 4, two dichotomous dependent variables measured whether offenders obtained post-release employment in the construction field, specifically, or in "any field" (1 = yes, 0 = no). Although the dependent variables captured whether an offender was able to obtain employment, they omitted the amount of time an offender had to pursue employment. Therefore, more sophisticated measures were also included in the analyses that captured how much time offenders spent in the community and, thus, were able to pursue employment. For example, some offenders were released prior to others and would therefore have had more time to gain employment. As a result, a measure of how many months offenders had lived in the community was included. Further, it was necessary to include control variables that captured the events that likely removed an offender from his community, thereby impacting his opportunities to gain employment, such as a supervised release revocation or a reincarceration. Finally, because post-release employment data were only available after January 2005, the 379 offenders released prior to this date had missing employment data. In response, a variable measuring the number of months an offender lived in the community prior to January 2005 was included to show whether being released earlier had an impact on offenders' ability to gain employment. To investigate both hypotheses, the dependent variables were regressed on the collection of control variables presented in Table 2; however, only the significant effects were presented in Table 4.

Table 4. Logistic Regression Models Predicting Post-Release Employment, Significant Effects Shown

Predictors	Construction Field	Any Field
	Odds Ratio (Exp(B))	Odds Ratio (Exp(B))
Participation in AHP	2.413 **	n.s.
Race/Ethnicity		
White	3.323 **	n.s.
(Minority)		
Age at Release	0.956 **	0.959 **
Length of Stay, in months	0.973 *	0.984
Offense Type		
Property	0.360 *	n.s.
Drug	n.s.	n.s.
Other	n.s.	n.s.
(Person)		
Length of Post-Release Supervision, in months	1.042 **	1.057 **
Likelihood Ratio (-2 log L)	397.642	486.924
R-Square	0.203	0.158
Number of Parameters	19	19
N	448	448

*p<.05 **p<.01 ***p<.001

The results of the post-release employment analyses, presented in Table 4, showed that offenders who participated in the AHP program were 2.42 times more likely to gain construction-related employment than comparison group members. The odds (not shown) were slightly better for program completers (odds ratio = 2.65; p <.001) and were worse for program terminations (odds ratio = 1.842; p = .126). The findings also showed that the odds of securing construction-related employment were significantly greater for offenders who were white, younger, drug offenders, and on supervised release.

When focusing on "any field," while also controlling for all other variables in the model, the results indicated that AHP did not significantly impact the odds of obtaining post-release employment in "any field." Offenders who had the greatest odds of obtaining employment in "any field" were those who were younger, had longer periods of post-release supervision, and had been released from prison in more recent years.

Overall, the results of the post-release employment analyses revealed that AHP participants did have significantly higher odds of gaining employment in a construction-related field (i.e., 2.62 times greater odds for program completers and 2.42 times greater for all

participants) than members of the comparison group but did not have significantly higher odds of gaining employment in "any field." The latter finding deviates from prior research that has examined the impact of vocational education (broadly defined) on post-release employment in any field. However, AHP is a very specific type of vocational training (i.e., construction skills) and, therefore, it may be more reasonable to expect that skills gained in this program would be most marketable in the construction field.

RESEARCH QUESTION #3: DOES AHP REDUCE COSTS TO THE STATE?

There is very little information about how much money it costs to operate prison vocational programs (Crayton and Neusteter, 2008). In line with the one systematic review that has been published (Aos, Miller and Drake, 2006b), it was expected that AHP could potentially reduce costs to the State of Minnesota and local non-profits agencies in six areas.

First, while participating in AHP, offenders were moved from MCFs to local correctional facilities, which may have provided the State with a less-costly housing option for offenders and brought needed financial resources to local jails. Second, AHP could have produced a benefit to the local non-profit agencies by offering construction labor at a reduced rate. Third, AHP may have saved local non-profit agencies additional monies by providing them with no-interest loans to fund remodeling or new construction projects. Fourth, to the extent that construction skills gained in AHP assisted offenders in obtaining post-release employment, the program may have produced a benefit to the State of Minnesota through municipal and state income taxes paid by offenders who, without gaining that construction experience, may not have been able to secure an income. Fifth, to the extent that AHP participants had a lower incidence of recidivism, and, as a result, spent fewer days incarcerated in prison or committed less violent and, therefore less costly crimes, against society, the program may have reduced recidivism costs to the state.

Housing AHP Participants in Local Correctional Facilities

To examine whether moving AHP participants from prison to local correctional facilities may have provided the State with a less costly housing option for offenders, housing costs were calculated for the time period between April 1998 (the beginning of the study) and December 2008 (the end of the follow-up period). To be included in the study, AHP participants must have entered the program after April 1998 and exited prison before December 2005. During this

period of time, the 224 AHP offenders spent an average of 312.02 days participating in the program and, during that time, were housed in local correctional facilities (mostly county jails).

Consistent with other cost-benefit analyses conducted by the Minnesota Department of Corrections (see Duwe & Kerschner, 2008), this study used marginal costs, rather than fixed costs, so as to avoid inflating the magnitude of costs avoided. Fixed costs contain start-up costs associated with the construction and staffing of a prison, whereas marginal costs include only food, clothing, medical, and other expenses that vary with the size of the inmate population. The findings presented here, utilizing the marginal costs, represent the most conservative cost-avoidance estimates available. Further, the marginal per diem used is an average of each yearly per diem over the course of the study.

The results show that it costs less to house offenders in county facilities (an average of $50.50 over the study time period) than in DOC prisons (an average of $65.25 for the study time period). Therefore, each day an offender participated in AHP saved $14.75 for the State of Minnesota. Because each AHP offender spent 312 days, on average, in the program, at a savings of $14.75 per day, the State of Minnesota avoided a little more than $1 million ($1,030,914) in housing costs due to housing AHP participants in local correctional facilities. And these costs helped bring, as noted earlier, needed financial resources to local jails.

Labor Costs for AHP Contracts

In 1998, when the Minnesota Legislature appropriated $700,000 to the DOC to initiate the AHP, the commissioner of corrections was directed to develop a program that would generate income and be self-supporting. To accomplish these goals, the program decided to place the entire $700,000 into a special account and finance the program, instead, by charging non-profit agencies for the use of DOC inmate labor. The contract for the services of the AHP crew provided for the cost of the crew leader's salary and benefits, vehicle expenses, some equipment, and inmate wages ($1 to $1.50 per hour).

The non-profit agencies served as the general contractor for all projects and were responsible for identifying the work to be done; purchasing materials; subcontracting for labor not provided by the AHP crew (e.g., electrical, mechanical, excavation); and obtaining licenses, permits, and inspections. The non-profit agency was also responsible for purchasing the lots, marketing the houses to qualified buyers, assisting buyers with finding financing, and providing

home buyer education classes. These non-profit agencies often contracted with other work crews for general labor, in addition to AHP, and when they did they generally paid considerably more money for these crews.

Program administrators reported that AHP work crews contracted for 763,316 hours from 1998 to 2009. Over the 12 years, crews worked between 3,530 to 98,828 hours per year—resulting in an average of 63,609 hours per year. However, estimating the precise amount of money saved by these non-profit agencies by utilizing AHP work crew labor was challenging. Although it was known what agencies actually paid for AHP labor, these contracts do not elucidate what agencies would have paid for a non-AHP work crew to perform the same labor. To obtain this information, non-profit agencies were contacted and asked how much they would have paid if AHP labor were unavailable for those projects.

While it was not possible to contact each non-profit agency ever contracted with, the four non-profit agencies that currently have contracts for AHP work crews were contacted. All four agencies contacted (i.e., Southwest Minnesota Housing Partnership, West Central Community Action, Headwaters Regional Development Commission of Bemidji, and Common Ground) responded with information that shaped the estimates presented. Three of the agency representatives explained that it would be too labor-intensive to calculate hourly costs for both AHP and non-AHP general labor. However, one agency, Common Ground, a metro-area non-profit, estimated that the average hourly cost for an AHP inmate in 2008 was $6.73, whereas the average hourly cost for other workers was $22.28. Because Common Ground contracted for 17,170 hours of labor in 2008, at $15.55 less than the market rate, their agency saved $266,993.50 in hourly wages by contracting for AHP offenders.

Common Ground is located in the seven-county metro area, whereas many of the other non-profits are in more rural locations and may have been able to hire labor at a rate lower than $22.28. However, all three of the four contractors who currently operate AHP work crews said that they would likely have paid $30-$50 per hour for comparable non-AHP general labor. Therefore, it is more likely that the estimate of $22.28 is below the actual value contractors would have to pay if AHP work crews were not available. However, because hourly estimates were not available from each non-profit agency, the hourly estimates from Common Ground were used for each contracted agency.

Third, according to all agencies contacted, the efficiency of AHP crew members varied. Some produced work equivalent in quality and efficiency as non-inmate crew members, whereas others were slower or produced lower quality work. This variation, the contractors explained, was largely dependent on the abilities of the crew leader to focus the crew and keep the men busy. One contractor emphatically explained the central role played by an efficient and skilled crew leader in constructing a quality home in a timely manner, "If you have a knowledgeable crew leader, it is not as important to have skilled laborers. The crew leader can train one group of men how to lay concrete while simultaneously training another to frame." Another contractor explained that it is very important for the crew leader to be "in the trench," setting the pace and quality. Nevertheless, three of the four agencies agreed that because there is a common standard in construction there was not a final quality difference between what the AHP crew produced in comparison to what another non-inmate crew could produce. The fourth contractor explained that, while he had concerns about his AHP crew who had produced lower-quality work, he was working closely with program administrators and believed these issues would be resolved.

Therefore, it is possible that AHP crews may have required a greater number of hours to complete a project than another non-inmate work crew. However, the third agency contacted shared that he felt utilizing AHP labor significantly shortened the length of his projects, compared to when he hires other subcontractors, for several reasons. First, with AHP crews, he can control the pace and quality of the work performed. Second, he is not tied to a subcontractor's schedule; instead, the AHP crew is available every day, which allows him to schedule out their time and keep a project moving. Third, with AHP crews, he can change aspects of a building project without having to renegotiate a contract with a subcontractor. He does not need to pay the change-order fees that are associated with changing aspects of a project along the way. He thus believes he is able to build homes 40 percent faster than other "outstate" contractors (who do not contract for inmate labor) because he is able to keep crews moving quickly. Nevertheless, because there was not agreement between the agencies and no one was able to quantify to what extent workers may be more or less productive per hour, this limitation was not figured into the savings estimate.

For these reasons, it is difficult to state whether the estimate provided is a conservative estimate or an overestimate of the true savings to local non-profit agencies. That being said, AHP offenders worked for 763,316 hours and, at the hourly rate differential supplied by

Common Ground ($15.55), AHP produced a benefit of $11,869,563.80 to local non-profit agencies by offering construction labor at a reduced rate.

No-Interest Loans Issued to Non-Profit Agencies

In the interest of generating a greater number of affordable housing projects, AHP program administrators resolved to lend money to non-profit agencies in the form of interest-free loans. As a result, this action may have saved local non-profit agencies money.

In 1998, program administrators used the full legislative appropriation of $700,000 to establish the AHP revolving loan fund. Over the years, program administrators have added $240,000 to the fund. Although only $940,000 has ever been available at one time, over $3.1 million has been allotted from this fund for the financing of construction projects.

Six non-profit agencies have been the recipients of these no-interest loans. If these agencies had financed their projects through other lenders, it is estimated that they would have been charged at least two percent interest on their loans. Program administrators kept an excel spreadsheet that detailed how much money each agency was given and the date the loan was disbursed. The spreadsheet also contained dates for when the loans had been paid back. Accounting for the amount of time they took to pay back their loans, these agencies would have collectively paid $71,170 in interest for the loans they received interest-free from the AHP revolving loan fund. Therefore, these agencies avoided paying over $71,000 in interest.

Post-Release Employment Earnings

The fourth area where AHP could reduce costs to the State involves tax revenue resulting from employment. To examine whether AHP participants, using their newly-acquired construction skills to obtain employment, contributed more money to state income tax revenue than comparison group members, DEED data were utilized. During the 17 quarters (January 2005-March 2009) in which DEED information was available, the 161 AHP participants who were employed earned an annual income of approximately $12,203. Collectively, AHP participants earned a total of $8,350,101, whereas the 142 comparison group members earned $6,834,764. Therefore, AHP participants earned $1,515,337 more than the comparison group members during the time in which data were available.

Although it was beyond the scope of this project to obtain actual tax records to determine what percentage of these funds contributed to municipal and state tax bases each year, an estimate was calculated using the State of Minnesota's Individual Income Tax Tables for the years 2005 through 2008. According to the tax tables, individuals earning $12,203 would have paid $655 each year to the State of Minnesota, or 5.3 percent of their annual income. Therefore, it is expected that AHP participants paid $80,313 to the State of Minnesota in excess of what the comparison group was able to contribute (i.e., 5.3% of $1,515,337).

A few caveats should be included. It was probable that AHP participants claimed deductions and, as a result, paid less than $655 per year in taxes. This would have lowered the estimate provided. A second caveat is that actual incomes may have varied from year to year, placing offenders into a higher or lower tax bracket. It is difficult to speculate whether this would have subsequently raised or lowered their overall income tax contribution. Finally, since financial data were not available from 1998 through 2004, taxes paid on income earned during that time period were not included in the above estimate. Therefore, it was more likely that the actual amount of taxes paid was greater than the estimate provided.

Costs of Recidivism

There are two components to this hypothesis: costs associated with reincarceration and costs associated with the tangible and intangible costs associated with the crimes committed. To the extent that AHP participants had a lower incidence of recidivism, and as a result spent fewer days incarcerated in prison, the program may have reduced reincarceration costs to the State. Finally, to the extent that AHP group members committed less violent and therefore less costly crimes against society, the State of Minnesota may have avoided the tangible and intangible costs associated with the crimes committed.

Estimation of Reincarceration Costs

Fewer AHP participants were reincarcerated during the follow-up period than the comparison group (as shown in Table 3) and, as a result, may have spent fewer days reincarcerated in a DOC prison, thereby reducing post-release incarceration costs to the state. When an offender is reincarcerated, either for a supervision revocation or to serve a sentence for a new crime, the housing, clothing, and food costs for that incarceration must be calculated.

To examine whether AHP reduced reincarceration costs to the state, it is important to examine not only the reincarceration rates but also to calculate the length of stay for each reincarceration in order to determine which group spent fewer days in a DOC prison. Table 3 shows that, during this time, 120 offenders from the comparison group were reincarcerated after their initial release from prison. By comparison, 113 AHP participants returned to prison for any reason. Although fewer AHP participants returned to prison, those who did return stayed for a greater number of days. Comparison group members who returned to prison were housed in a DOC prison for a total of 601 days on average after their initial release from prison, whereas the average was 668 days for AHP participants.

To calculate the cost of reincarceration-related housing, the number of AHP offenders who were reincarcerated (113) was multiplied by the average number of days they spent in prison (668). The result indicates that AHP participants required post-release housing for a total of 75,442 days. This number was then multiplied by the average marginal per diem of $65.25 (i.e., the per diem was averaged over the course of the study). Using these calculations, this group cost the State approximately $4,922,603 in reincarceration-related housing costs. By contrast, the 120 comparison group inmates who returned to prison spent a total of 72,143 days in prison at a cost of $4,707,318.

Cost of Crimes Committed Estimates

To the extent that AHP group members committed less violent and therefore less costly crimes against society, the State of Minnesota may have avoided costs associated with the crimes committed. Researchers have estimated the "bottom up" costs of crimes to society in terms of victim costs, risk of homicide costs, mental health care costs, criminal justice system costs, and criminal career costs for a broad range of crime categories (Rajkumar and French, 1997; McCollister, French, and Fang, Forthcoming). Researchers have also surveyed citizens regarding what they would be willing to pay (WTP) for crime reductions in certain crime categories (Cohen 1998, Cohen et al., 2004). Cohen and Piquero (2007) estimated both "bottom up costs" and WTP estimates, in 2007 dollars, based on the actual offending behavior of a 1958 cohort comprised of more than 27,000 individuals. Using their calculations, Table 5 illustrates the estimated cost to Minnesota communities for crimes committed by participants in the study (n=448) from the time after their release from prison until the end of the follow-up period.

Only convictions that occurred in Minnesota were included in these calculations. The reconviction data show that members of the sample were convicted of 630 crimes (i.e., felony, gross misdemeanor, and misdemeanor) during this time period. However, because 90 of these convictions were for unknown offenses, costs for these crimes were unable to be estimated. The remaining 540 convictions were placed into the crime categories estimated by Cohen & Piquero (2007). Note that, because the authors did not provide a cost estimate for drug crimes, these crimes were grouped into the "other" category.

As shown in Table 5, AHP participants were convicted of 206 crimes totaling an estimated $2,045,000 in "bottom up" costs to the State of Minnesota. Comparison group members were convicted for 266 crimes totaling an estimated $2,310,400 in "bottom up" costs to the State of Minnesota. Because the offenses committed by the AHP group totaled to a lesser amount of money, the tangible cost of crime for this group was $265,400 of avoided costs to the State of Minnesota. Combining the two areas of recidivism-related costs, the costs incurred by reincarceration ($215,148) were offset by the benefit of committing less-costly crimes against society ($265,400) to produce $50,252 in recidivism costs avoided.

Table 5. Frequency and Cost of Reconvictions, by Group

			Number of Convictions	
Conviction Type	"Bottom Up" Costs	WTP Estimate	AHP -- Total	Comparison Group
Murder	$5,000,000.00	$11,800,000.00	0	0
Rape	$150,000.00	$290,000.00	2	1
Armed Robbery	$50,000.00	$280,000.00	2	2
Robbery	$23,000.00	$39,000.00	0	0
Aggravated Assault	$55,000.00	$85,000.00	7	6
Simple Assault	$11,000.00	$19,000.00	10	16
Burglary	$5,000.00	$35,000.00	28	32
Motor Vehicle Theft	$9,000.00	$17,000.00	11	18
Larceny	$2,800.00	$4,000.00	25	33
Drunk Driving Crash	$30,000.00	$60,000.00	23	32
Arson	$60,000.00	$115,000.00	1	1
Vandalism	$1,000.00	$2,000.00	1	7
Fraud	$3,500.00	$5,500.00	14	18
Other Offenses (Drug, Traffic, Weapons, etc.)	$500.00	$1,000.00	82	100
Total Convictions During Follow-up Period			206	266
Estimated Cost of Crimes --"Bottom Up"			$2,045,000.00	$2,310,400.00
Estimated Cost of Crimes --WTP Estimate			$4,848,000.00	$5,470,000.00
N			224	224

Note: Source for estimates is Cohen & Piquero (2007)

Summary of Benefits and Costs

Although many vocational programs have been reviewed, few have provided estimates of the costs to operate those programs. This study attempted to fill that gap in the literature. Five hypotheses were tested. It was found that AHP did provide financial benefit to the State of Minnesota in five of the hypothesized ways. First, the program reduced incarceration costs to the State by housing program participants in local correctional facilities ($1,030,914) as opposed to state prisons, which are more costly. Second, the inmate labor supplied to non-profit agencies was more affordable than the market rate these agencies would have paid for general construction labor. Non-profits saved an estimated $11,869,564 by using inmate labor. Third, the AHP revolving loan fund extended interest-free lines of credit to non-profit agencies for use in constructing affordable housing, saving these agencies $71,170. Fourth, AHP participants earned more post-release than comparison group members and paid an estimated $80,313 more in state taxes as a result. Finally, AHP produced $50,252 of avoided recidivism costs to the State of Minnesota.

Table 6. Cost-Benefit Analysis Results

Item	Costs Avoided
Reduced Cost of AHP Housing	$1,030,914
Reduced Cost of Inmate Labor	$11,869,564
No-Interest Financing for AHP Loans	$71,170
Tax Revenue from Employment Earnings	$80,313
Costs to Recidivism	$50,252
Total Costs Avoided	$13,102,213
Benefit to Cost Ratio	$61.90: $1.00

After totaling the figures from the five areas discussed above (see Table 6), the results show that AHP has produced an estimated $13.1 million in costs avoided to the State. Given that this estimate was based on a sample of 224 AHP participants, the results suggest that the program produced a reduction of $58,492 in costs to the State per each offender participant. Moreover, the program produced a benefit of $61.90 for every dollar spent. Further, the benefits AHP produced are nearly four times greater than that reported by Aos, Miller and Drake (2006b), who found that their program produced a benefit of $13,738 for each offender who participated.

Limitations of the Cost-Benefit Analysis

There are additional costs and benefits that could have been discussed and included in this section but were unable to be incorporated. First, program operating costs were not included because, according to program administrators, they are largely covered by the contracts with local non-profit agencies. Costs not calculated include portions of program administrator salaries and start-up costs for work crew equipment. The DOC does not employ full-time AHP staff. Instead, there are four program administrator positions that support the program with approximately five to ten percent of their time annually. For the purposes of this study, it was not possible to calculate these costs but they are included as limitations of the cost-benefit analysis. It should be noted, however, that the program was able to increase its legislative endowment of $700,000 to over $900,000 because of money collected in contracts. Therefore, it is unlikely that the inclusion of operating costs would significantly diminish AHP's "costs avoided" to the State of Minnesota.

While the realized costs of the AHP program were easier to calculate, its programmatic benefits to the community were more difficult to quantify and, thus, to calculate. For example, communities profited economically from the presence of affordable housing in their neighborhoods (e.g., through increased property tax revenue paid on new or improved properties); employment for their subcontractors (e.g., electricians and plumbers); materials purchased from their home-improvement retail stores; and increased revenue at local jail facilities (e.g., payments made to local jail facilities for housing AHP participants). Ultimately, it is likely that AHP produced even greater benefits than are represented in this analysis.

RESEARCH QUESTION #4: DOES AHP REDUCE OFFENDER RECIDIVISM?

Even though reductions in recidivism were not stated goals of the program, the evaluation also examined this outcome. The results of the Cox regression models that analyzed time to the three recidivism events (i.e., first arrest, first reconviction, and first reincarceration for a new crime) are shown in Table 7. The results of all three recidivism analyses show that, controlling for other factors, participation in AHP did not have a statistically significant impact on the hazard of experiencing any of the three recidivism measures. All results were in the negative direction but did not reach statistical significance as previous studies have found.

The results from the recidivism analyses further indicate that offenders who were younger, had more previous prison commitments, were property offenders, were chemically dependent, or had a greater number of prior supervised release revocations experienced a significantly increased risk of recidivism (for at least one of the three measures). In contrast, white offenders and those released to supervision (versus released to no supervision) had a significantly lower risk of recidivism for at least one of the three measures.

Although participation in AHP was not a significant predictor of any of the three recidivism events in Table 7, it was worth examining whether AHP outcome (i.e., program completion versus program termination) was associated with recidivism. To investigate whether completing AHP had a stronger impact on recidivism than participation that ended in program termination, the program participation measure was partitioned into program completion, program termination, and comparison group (i.e., no participation; the reference group). The results (not shown) indicated that, compared to the reference group, both types of AHP outcomes did not significantly lower recidivism. However, program completion approached significance in the rearrest model (p =.102) and in the reconviction model (p =.061).

Table 7. Cox Proportional Hazards Model: Time Until Three Recidivism Events, Significant Effects Presented

Measure	Rearrest	Reconviction	Reincarceration
	Hazard Ratio (exp(B)	Hazard Ratio (exp(B)	Hazard Ratio (exp(B)
Race/Ethnicity			
White	0.648 **		
(Minority)			
Age at Release	0.976 **	0.962 ***	0.966 **
Previous Prison Commitments	1.179 ***	1.263 ***	1.266 ***
Offense Type			
Property	1.917 *	2.664 **	3.094 *
Drug			
Other			
(Person)			
Chemically Dependent		1.792 **	
Intensity of Post-Release Supervision			
Supervised Release		0.186 **	0.163 **
Work Release		0.125 **	0.088 **
CIP and ISR		0.090 *	0.050 *
(Discharge)			
Prior Supervision Revocations	1.170 *	1.254 **	1.318 **
Likelihood Ratio (-2 Log L)	111.275 ***	152.924 ***	165.130 ***
df	18	18	18
N	448	448	448

*p<.05 **p<.01 ***p<.001

The results suggest that participation in the AHP program, regardless of the outcome of that participation, did not significantly impact the hazard of recidivism for any of the three recidivism events examined. Yet, due to the fact that program completion approached significance in the rearrest and reconviction models, there was reason to suspect that the effect of program outcome was being moderated by another factor in the models. To explore this hypothesis, interaction terms were entered into the models for each recidivism outcome. The interaction models revealed that, in fact, the relationship between program completion and rearrest is dependent on the number of times an offender was previously incarcerated (interaction coefficient = .819, p =.037) and whether an offender committed a property-offense (interaction coefficient = .497, p = .014). Specifically, the results indicated that completing the program significantly reduced the risk of rearrest for property offenders and those with longer criminal histories. Conversely, the risk of rearrest was significantly greater for offenders who completed AHP but were chemically dependent or had lengthy histories of supervised release revocations.

Although the recidivism analyses did not reveal the same reductions in recidivism that have been reported in other studies, this could be due to the fact that, unlike previous studies that have evaluated multimodal vocational programs, this study was better able to isolate the independent impact of vocational training. Further, the results of the interaction analyses point to another possible explanation for why AHP did not experience the same recidivism reductions as other programs. Because AHP was shown to be more effective for certain offenders (e.g., property offenders), it is possible that other programs service a greater number of these types of offenders while excluding offenders with other characteristics (e.g., drug offenders or those with histories of supervision violations) who, this study found, receive less benefit from the program in terms of recidivism reductions.

CONCLUSION

Summary of Findings

First, AHP increased affordable housing in Minnesota by constructing 285 new homes and renovating at least 60 existing homes. Second, the results of the post-release employment analyses demonstrated that participation in the program significantly increased one's odds of obtaining employment in a construction-related field but not significantly increase one's odds of obtaining post-release employment in general. Third, in ten years of operation, AHP provided

benefits to the State of Minnesota in terms of reduced housing costs for offenders who participated in the program ($1,030,848); reduced cost of construction labor to non-profit agencies ($10,706,704); provided no-interest financing for the construction of affordable homes ($71,000); increased post-release employment earnings ($1,515,337); and lowered costs of recidivism ($50,252). Altogether, the results of the cost-benefit analysis showed that AHP offenders produced over $13.1 million worth of costs avoided to the State of Minnesota. Finally, the results of the recidivism analyses indicated that, although AHP participants had lower rates of recidivism, the program did not significantly reduce the rate at which offenders committed new crimes.

Discussion

The results of this study deviate from findings presented in previous research in several ways. The first way this study deviates from findings presented in previous research is that AHP participants were more likely to gain employment in the construction field but were not more likely to gain employment in general. However, over the course of the study they did earn substantially more than the comparison group ($1,515,337). The apparent marginal impact on employment, however, could be tied to the lack of pre-incarceration employment data available from DEED. This is a potentially important control variable and may be the most important predictor of post-release employment. If the comparison group had greater pre-employment work experience than the AHP group, then the employment results, after controlling for prior work history, could show that AHP had a stronger impact on post-release employment than was presented here. On the other hand, if the opposite were the case, then the results could show no impact. The lack of work history data simply points to the tentative nature of the conclusions about the impact on post-release employment.

The second way this study deviates from findings reported in earlier studies is that the cost-benefit findings are larger than those reported in Aos, Miller and Drake (2006b). This could be attributed to the methods used to calculate the costs and benefits. The authors used projected recidivism and crime rates to estimate whether implementing programs described as “alternatives to prison” could, in the future, reduce costs to the State of Washington. The present study was retrospective and calculated actual costs spent and costs avoided. These calculations were not based on the likelihood of future crimes occurring; rather, the estimated costs were calculated

based on what crimes were actually committed and what it actually cost to house offenders in prisons for the time period examined. Aos, Miller and Drake (2006b) admit to using an extremely conservative calculation and this was perhaps the best explanation for why the benefit calculated in this study far exceeded (i.e., 384% higher) the projections calculated in their study.

Finally, even though reductions in recidivism were not stated goals of the program, the evaluation also examined this outcome. This study did not find that recidivism was *significantly* reduced, as was reported in previous research (Aos, Miller and Drake, 2006a; MacKenzie, 2000; Seiter and Kadela, 2003). One explanation for why vocational programming alone did not (significantly) impact the recidivism outcomes could be that previously evaluated vocational programs have been comprehensive in nature (i.e., the programs have offered a number of services simultaneously). Several previous studies (MacKenzie, 2000; Wilson, Gallagher and MacKenzie, 2000; Gaes, 2008) have shown that programs that provide several prison-based and post-release services to offenders (e.g., chemical dependency treatment, education, vocational training, employment assistance, etc.) have significantly reduced recidivism. However, when evaluators attempted to review these multi-component programs, they found it difficult to isolate the effect of any one component (MacKenzie, 2008). This study, however, was able to isolate the impact of the vocational training, which turned out not to be a significant predictor of recidivism and post-release employment, as other studies had found it to be. This finding could reinforce the belief that a continuum of care is what matters most in reducing recidivism. Stand-alone services may not be enough to change an offender's trajectory; rather, a confluence of programs is what makes the (statistical) difference.

Another explanation for why AHP was not found to significantly impact recidivism is because the program was not designed for this purpose. Because lowering recidivism was never a stated goal of AHP, no therapeutic components were implemented—aside from acquiring construction-related skills and experience—that specifically targeted criminogenic behavior. In general, with any program evaluation, correctional program administrators and evaluators should consider whether the programs they evaluate were designed to achieve the aims they were testing; e.g., reductions in recidivism. Should the reduction of recidivism become one of the goals of the program, several adjustments could be made to the program to help achieve this goal. Perhaps most notably, AHP does not provide any aftercare programming for program completers after their release from prison. Because research has shown that providing a

continuum of care from the institution to the community is critical in reducing recidivism, efforts to redesign AHP so that it produces a decrease in reoffending could include the provision of post-release assistance relating to employment, education, housing, and chemical dependency treatment.

Ultimately, AHP has accomplished what it was legislatively designed to do—increase affordable housing, increase the extent to which offenders find employment in the construction field, and produce a cost-reduction benefit. By these measures, AHP is an effective correctional program.

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