

# **The Effects of Prison Labor on Institutional Misconduct, Post-Prison Employment and Recidivism**

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## **ABSTRACT**

We used a retrospective quasi-experimental design to assess the impact of prison labor on institutional misconduct, post-prison employment, and recidivism among 6,144 offenders released from Minnesota prisons between 2007 and 2011. In addition to using multiple measures of prison labor participation, we relied on propensity score matching to minimize observable selection bias. Participation in prison labor significantly improved post-prison employment outcomes, but it yielded mixed results for prison misconduct and had little overall impact on recidivism. When we examined the extent to which prisoners participated in prison labor, the best outcomes were observed for those who spent a greater proportion of their overall confinement time working a job in prison. As the percentage of prison time spent working increased, we found significant improvements in prison misconduct, post-prison employment, and several measures of recidivism.

**Keywords:** Prison Labor, Prison Misconduct, Employment, Recidivism

## INTRODUCTION

Several criminological theories emphasize the importance of employment for reducing criminal behavior. Rational choice theorists argue that legal income should reduce the motivation for crimes that involve financial gain (Becker, 1968; Cornish & Clarke, 1986). According to anomie theory, failure to find employment—an indication of success in mainstream culture—creates strain and, thus, can lead to crime (Merton, 1938; Cloward & Ohlin, 1960). Social control theories point to employment as a way to increase stakes in conformity, making crime less likely because employed individuals have too much to lose (Kornhauser, 1978; Sampson & Laub, 1993). Opportunity theories suggest that spending more time at work decreases one's time for unstructured leisure activities that are associated with crime (Cohen & Felson, 1979; Osgood et al., 1996).

Consistent with these theories, there is evidence that work is a turning point to divert offenders from criminal behavior. According to Sampson & Laub's study of crime over the life course (1993), delinquent adolescents were more likely to desist from crime as adults if they found stable employment (see also Wolfgang, Figlio, & Sellin, 1972; Farrington, Gallagher, Morley, St. Ledger, & West, 1986). Research on employment of released prisoners has shown that recidivism is lower among those who find stable, high-quality employment after release (Berg & Huebner, 2010; Horney, Osgood, & Marshall, 1995; Skardhamar & Telle, 2012; Visher, Debus-Sherrill, & Yahner, 2011). Notably, job quality is more important than simply obtaining employment: those in "career jobs" experience greater reductions in criminal behavior than those in "survival jobs" (Uggen, 1999; Huiras, Uggen, & McMorris, 2000; Uggen & Staff, 2001; Bucklen & Zajac, 2009; Lageson & Uggen, 2013). For example, in Bucklen & Zajac's study of former prisoners released from Pennsylvania

prisons (2009), while simply finding a job did not seem to differentiate between parole success and parole failure, offenders who were successful on parole (compared to parole violators) had higher wages, greater job security (i.e., they were employed the entire time they were on parole), and reported greater job satisfaction.

Although employment is an important factor in desistance from crime, most released prisoners have difficulty obtaining work due to the stigma of a criminal record, low levels of education and job training, and a lack of social capital (Lemert, 1951; Becker, 1963; Uggen & Staff, 2001; Raphael, 2010). It is suggested that prisoners who work while incarcerated will have more job skills, and therefore more job prospects after release. Accordingly, prior research suggests that prison employment has positive effects on obtaining a job after release (Saylor & Gaes, 1997; Northcutt Bohmert & Duwe, 2012; Duwe, 2015), as well as on hours worked and overall wages (Duwe, 2015). By increasing the odds that offenders obtain employment, prison labor should also be associated with lower rates of recidivism. While some evaluations showed reduced recidivism among offenders who participated in prison employment programs (Saylor and Gaes, 1997; Duwe, 2015), other studies found no effect on recidivism (Maguire, Flanagan, & Thornberry, 1988; Wilson, Gallagher, & MacKenzie, 2000; Northcutt Bohmert & Duwe, 2012; Richmond, 2014). In addition to employment and recidivism outcomes after release, scholars and practitioners suggest that participation in prison labor leads to lower levels of misconduct while incarcerated. While some studies suggest that prison employment reduces misconduct (Saylor & Gaes, 1997; Gover, Perez, & Jennings, 2008; Steiner & Wooldredge, 2008, 2014; Wooldredge, 1994; but for null results see French & Gendreau, 2006), few evaluations of employment programs have included institutional misconduct as an outcome measure.

Despite increased attention to the theoretical importance of employment for offender reentry and the potential benefits of prison labor on multiple pre- and post-release outcomes, there is limited research on the effects of prison labor on these outcomes. Further, the results of the available studies are inconsistent, possibly because many of them did not account for selection bias or time at risk. Therefore, the present study uses a retrospective quasi-experimental design to evaluate the effects of prison labor participation in Minnesota's prison system on institutional misconduct, post-release employment, and recidivism.

## **PRIOR EVALUATIONS OF PRISON LABOR**

### **Prison Labor and Misconduct**

Prison labor has been promoted as a way to reduce offender idleness, reducing behavioral problems and improving prison safety. It is argued that prison employment increases offenders' commitment to convention, discouraging involvement in deviance (Gaes & McGuire, 1985). In addition, prison employment provides structure and control for inmates, providing incentives for appropriate behavior (Colvin, 1992) and, from a lifestyle perspective, reduces leisure time in which inmates are likely to engage in misconduct (Wooldredge, 1994, 1998; Steiner & Wooldredge, 2008). Consistent with this idea, although there have been exceptions (e.g., French & Gendreau, 2006), employment and vocational programming has generally been found to reduce prison misconduct.

Prison-level studies show that violent misconduct is less likely when more inmates are involved in work programs. Gaes and McGuire's study of federal prisons (1985) found that higher work-related program participation (as opposed to educational programs, vocational training programs, or counseling) was related to lower rates of inmate-against-inmate assaults with weapons. Similarly, in McCorkle, Miethe, and Drass' study of state and

local correctional facilities (1995), facilities with higher proportion of inmates participating in employment, education, or industry programs had lower rates of inmate assaults against other inmates and inmate assaults against staff, but program participation had no effect on prison riots. However, Steiner and Wooldredge (2008) found the proportion of inmates with work assignments was not related to violent or nonviolent misconduct.

Individual- and multi-level studies have also shown that misconduct is lower among inmates who work in prison industries, controlling for individual differences. Saylor and Gaes (1997) found that participation in the Federal Bureau of Prison's Post Release Employment Project (PREP) significantly reduced misconduct. Further, Gover, Perez, and Jennings (2008) reported that employment in prison reduced disciplinary infractions. Similarly, Steiner and Wooldredge (2008) indicated that the number of hours spent per week in a work assignment was negatively associated with violent misconduct, alcohol or drug use, and other non-violent misbehavior (see also Steiner & Wooldredge, 2014). Steiner and Wooldredge (2014) found that time spent in educational/vocational programming reduced non-violent misconduct. However, French and Gendreau's meta-analysis of 68 studies (2006) showed that, overall, educational/vocational programs did not have significant effects on institutional misconduct.

### **Prison Labor and Post-Release Employment**

In addition to affecting institutional behavior, participation in prison industry is expected to have effects on post-release outcomes. It is believed that employment during incarceration provides offenders with marketable job skills, improving employment prospects after release. However, few studies have examined whether employment during incarceration increases the odds of obtaining adequate employment after release. Visher et al. (2011)

examined post-release outcomes among inmates released from Illinois, Ohio, and Texas prisons. Using percent of time employed during the follow-up period, Visher and colleagues found that prison work experience was positively related to employment after release. Saylor and Gaes' (1997) evaluation of the Federal Bureau of Prison's Post-Release Employment Project (PREP), which provided prison work experience and vocational training, showed that prison employment was related to post-release employment. One year after release from prison, program participants were 14 percent more likely to be employed. However, there were no statistically significant differences in wages earned.

Several studies conducted in Minnesota show that prison work programs can improve employment prospects after release. Northcutt Bohmert & Duwe's (2012) evaluation of the Affordable Homes Program (AHP), a prison work crew program that trains Minnesota offenders in the construction trade while they are serving time in prison, revealed that participants had significantly higher odds of gaining employment in a construction-related field than members of the comparison group; however, they did not have significantly higher odds of gaining employment in "any field." More recently, an evaluation of Minnesota's EMPLOY program—which provides inmates with pre-release employment training and post-release community support—found the odds of gaining post-release employment were 72 percent higher for program participants (Duwe, 2015). In addition to having greater odds of obtaining employment, program participants worked a greater number of hours than non-participants, resulting in higher overall wages (Duwe, 2015). Finally, according to Duwe and Clark's study predicting post-release employment (2017a), offenders who participated in prison labor were more likely to find employment, work more hours, and earn higher wages than offenders who did not.

## **Prison Labor and Recidivism**

Despite the arguments that employment is a protective factor against crime, few evaluations have examined the effects of correctional employment on offender recidivism. In their meta-analysis of corrections-based educational, vocational, and work programs, Wilson et al. (2000) were able to identify only four comparisons between offenders who participated in a correctional work/industry program and offenders who did not participate in this type of programming. Although the odds ratio for these four contrasts was 1.48, which amounts to a recidivism reduction of 20 percent, the effect was not statistically significant.

Among the correctional work/industry program evaluations analyzed by Wilson and colleagues (2000) were studies of New York's Prison Industry Research Project (PIRP; Maguire et al., 1988) and the Federal Bureau of Prison's PREP (Saylor & Gaes, 1997). In their evaluation of PIRP, Maguire and colleagues did not find a statistically significant difference in recidivism between offenders who worked in prison industries and those who did not. Unlike Maguire et al. (1988), Saylor and Gaes (1997) used propensity score matching and a Cox proportional hazards model to control for rival causal factors, including selection bias and time at risk. Using this more sophisticated and rigorous design, Saylor and Gaes (1997) found that prison employment significantly lowered recidivism.

More recently, Richmond (2014) evaluated the impact of a federal prison industry program, UNICOR, on recidivism among female prisoners. Relying on propensity score matching, Redmond (2014) found the program did not reduce recidivism. Likewise, Northcutt Bohmert and Duwe (2012) reported that AHP, a prison work crew program, had no effect on recidivism. However, other Minnesota work programs have been effective in reducing recidivism: Participation in Minnesota's EMPLOY program, which provides



offenders with employment assistance during the last several months of their incarceration and in their first year after release from prison, reduced the hazard ratio for recidivism by 32 to 63 percent (Duwe, 2015).

### **MINNESOTA'S PRISON INDUSTRY**

Minnesota prisons have provided inmates with employment opportunities since the late 19th century. In 1994, however, Minnesota Correctional Industries (MINNCOR) was created to organize and centralize prison industry operations within the Minnesota Department of Corrections (MnDOC). According to state law, MINNCOR's purpose is "sustaining and ensuring MINNCOR industries' self-sufficiency, providing educational training, meaningful employment and the teaching of proper work habits to the inmates" (Minnesota Statutes 2008, 241.27, subd. 1). The industries that make up MINNCOR involve a diverse set of products and services, including furniture, clothing, printing, and laundry. MINNCOR also offers subcontracting to companies in Minnesota's public and private sectors.

To participate in MINNCOR, prisoners must be in an assignable status and a secondary degree is required. However, prisoners who are on a waiting list for education programming can be assigned to industry until an education opening is available. Once a prisoner is in an assignable status, he or she can bid into an assignment. Prisoners can be fired from a prison industry job if they commit rule violations that occur during work (e.g., theft of a product) or are severe enough to invoke a segregation sentence. On a given day, about 15 percent of Minnesota prisoners are working in prison industry.

As noted above, Duwe and Clark (2017a) found that participation in MINNCOR significantly improved post-release employment outcomes, including odds of obtaining a job,

hours worked, and wages earned. However, because that study did not account for selection bias in offender work assignments, more investigation of the effect on MINNCOR on post-release employment is warranted. Further, the effects of MINNCOR participation on other relevant outcomes (i.e., institutional misconduct and recidivism) are still unknown.

## **DATA AND METHOD**

We used a quasi-experimental design to evaluate whether prison labor has an impact on misconduct, recidivism, and post-release employment. We compared outcomes between MINNCOR participants and a matched comparison group of non-participants who were released from Minnesota prisons between January 2007 and December 2011. Previous research has demonstrated that pre-prison employment is the strongest predictor of post-prison employment (Duwe & Clark, 2017a). To ensure we had at least one year of pre-prison employment data, which did not first become available until 2005 on the offenders in this study, we only included prisoners who had been admitted to prison after 2005. To allow for a sufficient follow-up period for the recidivism and post-release employment analyses, we included prisoners released through 2011.

Between 2007 and 2011, there were 3,072 offenders who had MINNCOR work assignments. During this same five-year period, there were 23,853 additional offenders released from prison who met the basic eligibility requirements for MINNCOR but did not participate in the program. Therefore, the overall sample for this study consisted of 26,925 offenders, of whom 11 percent entered MINNCOR. Complete data for each of the measures we analyzed were obtained on all 26,925 offenders. Data were fully available on each As discussed later, propensity score matching (PSM) was used to individually match the 3,072 MINNCOR participants with a comparison group of 3,072 offenders from the larger pool of

non-participants.

## **Outcome Measures**

### *Prison Misconduct*

We obtained data on prison misconduct from the Correctional Operations Management System (COMS) database maintained by the MnDOC. Prison misconduct, which was operationalized as a discipline conviction, includes behavior that ranges from disobeying orders from correctional staff to assaults against other inmates or staff. We used three different measures of prison misconduct. First, we examined whether offenders had any prison misconduct following the point at which they entered, or could have entered, MINNCOR. Second, because the misconduct data included information on when the infraction occurred, we analyzed the impact of MINNCOR participation on time to first prison misconduct. Finally, we examined the total number of discipline infractions that prisoners in the prison labor and comparison groups had after they entered, or could have entered, MINNCOR.

### *Post-Release Employment*

We obtained data on post-prison employment from the Minnesota Department of Employee and Economic Development (DEED) for the 26,925 prisoners in this study through June 2016. The main limitation with using the unemployment insurance (UI) data collected by DEED is that it does not capture any labor (or compensation for that labor) not reported to DEED, which can occur in situations where employees are paid “under the table” for their labor. In addition, because these data are compiled on a quarterly basis, information was not available on the specific date(s) when offenders entered and/or exited a job. Still, the DEED data provide important information not only on whether offenders obtained

employment, but also on how much they worked and the extent to which they were compensated. As a result, the post-release employment measures included: 1) any employment (dichotomized as “1” for employment and “0” for no employment), 2) total number of hours worked, 3) total wages earned, and 4) hourly wage.

### *Recidivism*

We defined recidivism as a 1) rearrest, 2) reconviction, 3) reimprisonment for a new felony sentence, or 4) return to prison for a technical violation revocation. While the first three recidivism variables strictly measure new criminal offenses, technical violation revocations (the fourth measure) is a broader measure of rule-breaking behavior. When prisoners are released to correctional supervision (i.e., parole), they can have their parole revoked for violating the conditions of their supervision. Because these violations can include activity that may not be criminal in nature (e.g., use of alcohol, failing a community-based treatment program, failure to maintain agent contact, failure to follow curfew, etc.), technical violation revocations do not necessarily measure reoffending. Yet, because “remaining law-abiding” is a common parole condition by which released prisoners must abide, technical violations also include revocations for lower-level criminal behavior (i.e., misdemeanor and gross misdemeanor crimes) that would not result in being resentenced to prison for a new felony offense (the third measure).

We collected recidivism data on the 26,925 released prisoners through June 30, 2015. Because the offenders in this study were released between 2007 and 2011, the follow-up time for recidivism ranged from 42-102 months. Data on arrests and convictions were obtained electronically from the Minnesota Bureau of Criminal Apprehension, whereas resentenced and revocation data were derived from COMS. Because these data measure only arrests,

convictions, or returns to prison that took place in Minnesota, the findings presented later likely underestimate the true recidivism rates for the offenders examined here.

## **Independent Variables**

### *MINNCOR Participation*

Our main variable of interest in this evaluation was participation in MINNCOR, which we measured three different ways. First, we used a binary measure in which MINNCOR participants were assigned a value of “1” while non-participants were given a value of “0”. Second, we measured the total number of days that prisoners worked a MINNCOR job during their time in prison. Finally, we measured the extent to which prisoners worked a MINNCOR job relative to their overall confinement period. More specifically, for the MINNCOR participants, we calculated the percentage of their time spent working a MINNCOR job compared to the total amount of time they spent in prison. For example, if a MINNCOR participant worked 100 of the 300 days spent in prison, then the MINNCOR percent value for this individual would be 0.33.

### *Control Variables*

The control variables we used in this study include those that were not only available in the COMS database but have also been shown to have an impact on prison misconduct, post-release employment, and/or recidivism for Minnesota prisoners. Even though prison misconduct and recidivism represent different behavioral outcomes, they share many of the same risk and protective factors due to a common underlying propensity for deviance (Jang et al., 2017). Given that past behavior is often the best predictor of future behavior, we included measures for prior prison misconduct, employment, and criminal history. Our prior prison misconduct variable measures the total number of discipline convictions that offenders

had during previous imprisonment with the MnDOC. Because existing research has shown that pre-prison employment is the strongest predictor of post-prison employment (Duwe and Clark, 2017a), we used the DEED data to measure whether offenders were employed in the year before they were admitted to prison. We also included several measures for criminal history, the strongest predictor of recidivism (Caudy, Durso, & Taxman, 2013; Duwe, 2014). In addition to measuring the total number of supervision failures (i.e., probation and/or parole revocations), the criminal history measures comprise the total number of convictions and the total number of convictions for felonies, violent offenses, drug offenses, and property crimes. Further, we included measures that assess the degree to which offenders specialized in felony, violent, drug, and property offending.

Along with demographic measures pertaining to gender, race/ethnicity, age, and marital status, we included measures for suicidal history and gang (i.e., security threat group or STG) involvement. We also accounted for prison admission type, offense type, commitment county (Twin Cities metro area versus Greater Minnesota), length of stay, and type of post-release supervision (i.e., supervised release, intensive supervised release or discharge/released to no supervision) because prior studies have indicated these variables are significant predictors of recidivism for Minnesota prisoners (Duwe, 2010; Duwe and Clark, 2013). In addition, because MINNCOR participation largely depends on educational achievement, we included a variable that measures whether individuals had a secondary degree. Finally, existing research on Minnesota prisoners has shown that involvement in effective interventions has a significant impact on recidivism (Duwe and Clark, 2017b) and post-prison employment (Duwe and Clark, 2017a) outcomes. As a result, our dataset includes a variable that measures the number of effective interventions in which individuals

participated while they were in prison.<sup>1</sup>

### **Propensity Score Matching**

PSM has been a popular method used in program evaluations to help achieve “balance” between the treatment and comparison groups among multiple covariates. In doing so, PSM can be used to control for observable selection bias. PSM provides estimates of the conditional probability of selection to a particular treatment or group given a vector of observed covariates (Rosenbaum & Rubin, 1985), and these estimates (i.e., propensity scores or predicted probabilities) are typically generated by estimating a logistic regression model in which program selection (0 = no selection; 1 = selection) is the dependent variable while the predictor variables consist of those that theoretically have an impact on the selection process. Once the propensity scores have been estimated, they are used to match individuals who entered programming with those who did not.

The main drawback with PSM is that, because propensity scores are based on observed covariates, PSM cannot control for any “hidden bias” from unmeasured variables that are associated with both program selection and the outcome variable. Moreover, in order for PSM to be effective, there must be substantial overlap among propensity scores between the treatment and comparison groups (Shadish, Cook & Campbell, 2002). If not, the matching process will yield incomplete or inexact matches and, thus, will not effectively control for observable selection bias. In addition, Rubin (1997) has noted that PSM tends to work best with larger samples.

We attempted to address these limitations by estimating a logistic regression model that included as many theoretically-relevant predictors as possible on a relatively large

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<sup>1</sup> The effective interventions include chemical dependency treatment, sex offender treatment, employment programming, cognitive-behavioral therapy, a correctional boot camp, and prisoner reentry programming.

**Table 1. Logistic Regression Model for MINNCOR Selection**

<u>Predictors</u>	<u>Predictor Description</u>	<u>OR</u>	<u>SE</u>
Minority	Minority = 1; White = 0	1.007	0.046
Age at Release (years)	Offender age in years at time of release from prison	1.002	0.002
Prior Employment	Employment prior to prison admission	1.003	0.045
Prior Prison Misconduct	Number of prior discipline convictions	0.999	0.001
Prior Supervision Failures	Number of prior revocations while under correctional supervision	1.010	0.015
Total Convictions	Total number of convictions, including index conviction(s)	1.006	0.004
Felony Convictions	Total number of felonies, including index conviction(s)	1.003	0.011
Felony Specialization	Specialization/diversity in felony offending	1.039	0.126
Violent Convictions	Total number of violent offenses, including index conviction(s)	1.017	0.014
Violent Specialization	Specialization/diversity in violent offending	0.978	0.164
Drug Offense	Total number of drug offenses, including index conviction(s)	0.977	0.019
Drug Offense Specialization	Specialization/diversity in drug offending	0.990	0.200
Property Offense	Total number of property offenses, including index conviction(s)	1.000	0.009
Property Specialization	Specialization/diversity in property offending	1.085	0.184
Marital Status	Married = 1; Unmarried = 0	1.102	0.069
Metro Commit	Prison commit from Twin Cities metropolitan area = 1; Greater Minnesota = 0	1.196**	0.044
New Court Commitment	New court commitment = 1; probation or release violator = 0	1.632**	0.050
Offense Type	Person offense serves as the reference		
Sex Offense	Sex offense = 1; non-sex offense = 0	0.959	0.095
Drugs	Drug offense = 1; non-drug offense = 0	1.171*	0.075
Property	Property offense = 1; non-property offense = 0	1.325**	0.071
Felony DWI	Felony DWI offense = 1; non-Felony DWI offense = 0	0.791*	0.099
Other	Other offense = 1; non-other offense = 0	1.233**	0.069
Length of Stay (months)	Number of months between prison admission and release dates	1.069**	0.002
Suicidal Tendencies	History of suicidal tendencies = 1; no history of suicidal tendencies = 0	0.793**	0.058
STG Criteria	Security threat group (STG) or gang affiliation criteria; 0-10	1.028*	0.013
Secondary Degree	Secondary degree = 1; less than secondary degree = 0	3.789**	0.064
Constant		0.011	0.341
N		26,925	
Log-likelihood		7512.998	
AUC		0.777	
Nagelkerke R <sup>2</sup>		0.181	

\*\*  $p < .01$

\*  $p < .05$



sample (see Table 1). In particular, we calculated propensity scores by estimating a logistic regression model in which the dependent variable was participation in MINNCOR. The variables included in a propensity score estimation model should consist of those related to the outcome—even if it is a weak association—that affect treatment selection and are not caused by the treatment (Shadish et al., 2002). Therefore, the covariates included in the logistic regression model presented in Table 1 were those that temporally preceded the beginning of MINNCOR employment. As such, the propensity score model did not include covariates such as participation in effective interventions, post-release supervision, or release year. However, we included these covariates in the multivariate models estimating the effects of MINNCOR on prison misconduct, recidivism, and post-prison employment.

With an area under the curve (AUC) value of 0.78 (see Table 1), the propensity score model performed well overall in predicting MINNCOR selection. As shown in Table 1, there were several covariates that significantly predicted whether prisoners participated in MINNCOR. Prisoners were significantly more likely to be selected when they had a secondary degree, were committed to prison from the Twin Cities metropolitan area, were admitted to prison as a new court commitment, were in prison for a drug or property offense, had a longer length of stay in prison, and had a stronger gang (i.e., STG) affiliation. Conversely, prisoners were significantly less likely to be selected when they were in prison for a felony DWI offense and had a history of suicidal tendencies. None of the other covariates, including those for prior employment, misconduct or criminal history, had a significant impact on MINNCOR selection.

After obtaining propensity scores on the 26,925 prisoners included in the

**Table 2. Propensity Score Matching and Covariate Balance for MINNCOR Selection**

<i>Variable</i>	<i>Sample</i>	<i>MINNCOR Mean</i>	<i>Comparison Mean</i>	<i>Bias (%)</i>	<i>Bias Reduction</i>	<i>t test p Value</i>
Propensity Score	Total	22.82%	11.24%	<b>66.31</b>		<b>0.00</b>
	Matched	22.82%	22.74%	0.42	-99.37%	0.85
Minority	Total	48.90%	49.30%	0.65		0.72
	Matched	48.90%	49.70%	1.31	100.00%	0.52
Age at Release (Years)	Total	34.43	33.77	5.60		<b>0.00</b>
	Matched	34.43	34.69	2.17	-61.22%	0.30
Pre-Prison Employment	Total	66.60%	66.40%	0.35		0.86
	Matched	66.60%	67.40%	1.39	300.90%	0.48
Prior Prison Misconduct	Total	7.20	7.34	0.68		0.67
	Matched	7.20	6.60	3.00	341.80%	0.15
Prior Supervision Failures	Total	1.60	1.83	10.85		<b>0.00</b>
	Matched	1.60	1.54	2.68	-75.28%	0.20
Total Convictions	Total	14.16	13.31	6.79		<b>0.00</b>
	Matched	14.16	14.24	0.60	-91.10%	0.77
Felony Convictions	Total	2.78	2.45	10.86		<b>0.00</b>
	Matched	2.78	2.86	2.54	-76.63%	0.23
Felony Specialization/Diversity	Total	0.85	0.86	3.52		<b>0.02</b>
	Matched	0.85	0.85	1.10	-68.75%	0.60
Violent Convictions	Total	1.79	1.69	4.02		<b>0.01</b>
	Matched	1.79	1.77	0.98	-75.53%	0.64
Violent Specialization/Diversity	Total	0.92	0.92	0.04		0.98
	Matched	0.92	0.92	0.62	1286.21%	0.77
Drug Convictions	Total	1.09	1.02	3.70		<b>0.02</b>
	Matched	1.09	1.10	0.59	-84.09%	0.78
Drug Specialization/Diversity	Total	0.96	0.96	3.35		<b>0.02</b>
	Matched	0.96	0.96	0.23	-93.21%	0.92
Property Convictions	Total	3.74	3.32	6.79		<b>0.00</b>
	Matched	3.74	3.73	0.20	-97.04%	0.93
Property Specialization/Diversity	Total	0.90	0.90	1.05		0.51
	Matched	0.90	0.90	1.10	4.35%	0.60
Marital Status	Total	10.70%	8.40%	6.27		<b>0.00</b>
	Matched	10.70%	11.20%	1.31	-79.10%	0.60
Metro	Total	55.20%	50.40%	7.87		<b>0.00</b>
	Matched	55.20%	55.20%	0.00	-100.00%	0.96
New Commitment	Total	57.10%	29.90%	<b>45.98</b>		<b>0.00</b>
	Matched	57.10%	59.20%	3.47	-92.45%	0.09
Sex Offense	Total	6.90%	7.40%	1.60		0.34
	Matched	6.90%	7.20%	0.96	-39.85%	0.65
Drug Offense	Total	24.30%	23.90%	0.76		0.62
	Matched	24.30%	25.00%	1.33	74.05%	0.52
Property Offense	Total	22.70%	22.50%	0.39		0.82
	Matched	22.70%	23.70%	1.94	397.18%	0.38
DWI Offense	Total	6.90%	6.40%	1.63		0.29
	Matched	6.90%	7.30%	1.28	-21.45%	0.55
Other Offense	Total	18.20%	14.50%	8.05		<b>0.00</b>
	Matched	18.20%	17.80%	0.85	-89.46%	0.72
Length of Stay	Total	15.43	7.68	<b>66.10</b>		<b>0.00</b>
	Matched	15.43	15.09	2.62	-96.03%	0.21
Suicidal Tendencies	Total	14.60%	17.10%	5.65		<b>0.00</b>
	Matched	14.60%	15.20%	1.38	-75.59%	0.52
STG Criteria	Total	1.00	0.82	8.64		<b>0.00</b>
	Matched	1.00	0.95	2.35	-72.83%	0.28
Secondary Degree	Total	89.60%	67.00%	<b>49.98</b>		<b>0.00</b>
	Matched	89.60%	90.00%	1.07	-97.85%	0.53

Total MINNCOR Degree N = 3,072

Total Comparison N = 23,853

Matched MINNCOR N = 3,072

Matched Comparison N = 3,072

propensity score model shown in Table 1, we used a “greedy” matching procedure that utilized a without replacement method in which MINNCOR participants and non-participants were matched within a relatively narrow caliper (i.e., range of propensity scores) of 0.01. Using this caliper, we obtained matches for all 3,072 prisoners who entered MINNCOR, resulting in a final sample of 6,144.

In Table 2, we present statistics that measure the degree to which PSM was effective in reducing observable selection bias. We use a measure (“Bias”) developed by Rosenbaum and Rubin (1985) that quantifies the amount of bias between the treatment and comparison

$$\text{Bias} = \frac{100(\bar{X}_t - \bar{X}_c)}{\sqrt{\frac{(S_t^2 + S_c^2)}{2}}}$$

samples (i.e., standardized mean difference between samples), where  $\bar{X}_t$  and  $S_t^2$  represent the sample mean and variance for the treated offenders and  $\bar{X}_c$  and  $S_c^2$  represent the sample mean and variance for the untreated offenders. If the bias value exceeds 20, the covariate is considered to be unbalanced (Rosenbaum & Rubin, 1985). Prior to matching, there were three imbalanced covariates—secondary degree, length of stay, and new court commitment. The results presented in Table 2 show that, after matching, we achieved balance between the MINNCOR and comparison groups, given that all of the covariates, including the propensity score, had bias values below 20.

## **Analytical Procedures**

### *Prison Misconduct*

Release from prison represents the point at which we begin tracking whether participation in MINNCOR had an impact on post-prison employment and recidivism. To

evaluate whether MINNCOR had an impact on prison misconduct, however, the date when prisoners began working a MINNCOR job represents the point at which we begin measuring whether prison labor affects misconduct. While the MINNCOR entry date was available for each of the 3,072 prisoners who entered MINNCOR, it was necessary to create hypothetical entry dates for the 3,072 offenders in the comparison group. If we did not create the hypothetical MINNCOR entry dates for the comparison group and instead looked at prison misconduct over the whole confinement period for these prisoners, it would almost assuredly bias the prison misconduct results in favor of the MINNCOR group. That is, the MINNCOR participants would likely fare better on the prison misconduct measures because their at-risk periods would be shorter than those for the comparison group.

Because the matching process yielded one-to-one matches, each MINNCOR participant had a counterpart in the comparison group. For MINNCOR participants, we calculated the point at which they entered MINNCOR relative to their total imprisonment. For example, if a MINNCOR participant was in prison for 500 days and he began working a MINNCOR job on day 100, he entered MINNCOR at the 20 percent mark of his confinement. We then applied this program entry percentage to create the potential entry date for his counterpart in the comparison group. For example, if the counterpart was in prison for 450 days, we identified day 90 (20% of 450 days) as the point when he would have entered MINNCOR. We used this same approach to calculate potential entry dates for all 3,072 prisoners in the comparison group. In evaluating the impact of MINNCOR on prison misconduct, we measured the occurrence of prison misconduct after the date of actual program entry for MINNCOR participants and after

the date of potential program entry for those in the comparison group.

We used three types of regression models—logistic, Cox, and a generalized linear model (GLM)—for each of the three prison misconduct measures. To estimate the effects of prison labor on whether individuals had any prison misconduct, we used logistic regression. In addition, to estimate the effects of MINNCOR on the total number of discipline convictions offenders had after their program entry date, we used GLM with a gamma distribution and a log link, as opposed to either ordinary least squares (OLS) or negative binomial regression models, because the errors for prison misconduct were not normally distributed and it best minimized all four measures of fit (deviance, Pearson, Akaike information criterion, and Bayesian information criterion). We used Cox regression, a survival analysis model, to examine the effect of MINNCOR on time to first misconduct. In estimating the impact of the covariates on prison misconduct, Cox regression contains both “time” and “status” variables. The “time” variable measures the number of days from the date of actual or potential program entry until the date of first discipline infraction, or the date of release for those without misconduct. The “status” variable, on the other hand, measures whether an offender has misconduct during the period in which s/he was at risk to recidivate.

#### *Post-Release Employment*

As noted above, the quarterly DEED data do not provide information on the specific date(s) when offenders entered and/or exited employment. Because employment start date information would be needed to use Cox regression, multiple logistic regression was used to assess the impact of MINNCOR on obtaining employment. Considering that logistic regression assumes the lengths of follow-up periods do not vary among

offenders, we examined post-prison outcomes over follow-up periods of one year (four quarters) and five years (20 quarters). Similar to the analyses for the impact of MINNCOR on total discipline convictions, a gamma log-link GLM was the most appropriate model to use to estimate the effects of prison labor on the total numbers of hours worked, total wages earned, and hourly wage.

### *Recidivism*

We used Cox regression to analyze the impact of MINNCOR on recidivism. In these analyses, the “time” variable measures the amount of time from the date of release until the date of first rearrest, reconviction, reincarceration, technical violation revocation, or June 30, 2015, for those who did not recidivate. The “status” variable, meanwhile, measures whether an offender recidivated (rearrest, reconviction, reincarceration for a new crime, and technical violation revocation) during the period in which s/he was at risk to recidivate.

To accurately measure the total amount of time offenders were actually at risk to reoffend (i.e., “street time”), it was necessary to account for supervised release revocations in the recidivism analyses. More specifically, for the three recidivism variables that strictly measure new criminal offenses (rearrest, reconviction, and resentenced), we deducted the amount of time they spent in prison for technical violation revocations 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, to achieve a more accurate measure of “street time”, 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 rearrest, a reconviction, a reincarceration

for a new offense, or if the offender did not recidivate prior to July 1, 2015.

## RESULTS

In Table 3, we present descriptive statistics comparing MINNCOR participants and offenders in the comparison group for the three outcome measures. For this table, we dichotomized the MINNCOR days and percent measures to better illustrate the effects of these variables on the outcomes. For MINNCOR days, we split participants into two categories: 1) less than 130 days working a MINNCOR job and 2) 130 days or more working a MINNCOR job. Likewise, for MINNCOR percent, we separated participants into two categories: 1) less than 33 percent of total confinement time working in MINNCOR and 2) 33 percent or more of total confinement time spent working in MINNCOR.

**Table 3. Prison Misconduct, Employment and Recidivism by MINNCOR Participation**

<i>Outcomes</i>	<i>Comparison</i>	<i>MINNCOR</i>	<i>MINNCOR Days</i>		<i>MINNCOR Percent</i>	
			<i>&lt;= 130 Days</i>	<i>&gt; 130 Days</i>	<i>&lt;= 33%</i>	<i>&gt; 33%</i>
<u>Misconduct</u>						
Any Misconduct	33.3%	40.4%	41.6%	38.3%	50.0%	28.1%
Total Misconduct	2.01	2.42	2.62	2.06	3.43	1.12
<u>Employment: 1 Year</u>						
Employment	47.0%	51.6%	52.1%	50.7%	52.6%	50.0%
Total Hours	319.4	355.1	362.7	341.26	375.08	550.98
Total Wages	\$3,721.84	\$4,138.05	\$4,160.46	\$4,097.71	\$4,287.66	\$7,757.25
Hourly Wage	\$12.02	\$11.95	\$11.74	\$12.33	\$12.18	\$11.64
<u>Recidivism</u>						
Rearrest	74.3%	75.4%	76.5%	73.6%	76.0%	74.6%
Reconviction	54.1%	55.9%	56.7%	54.3%	55.9%	55.7%
Reincarceration	40.2%	40.6%	41.5%	39.1%	41.0%	40.2%
Revocation	42.0%	43.4%	44.6%	41.3%	46.8%	39.0%
N	3,072	3,072	1,975	1,097	1,732	1,340

The results show that 40 percent of MINNCOR participants had a discipline conviction compared to 33 percent in the comparison group. In addition, the average number of discipline convictions for MINNCOR participants (2.42) was greater than that for the comparison group (2.01). More than half (52%) of MINNCOR participants found

work in the first year after release from prison compared to 47 percent for the comparison group. Moreover, MINNCOR participants worked nearly 40 more hours, on average, than the comparison group, and their overall wages were higher. Compared to the prisoners in the comparison group, those in MINNCOR had slightly higher recidivism rates, but not by much, for each of the four measures.

When we take a closer look at the number of days spent working in MINNCOR, the prison misconduct and recidivism results are better for participants with 130 days or more in MINNCOR compared to those with less than 130 days. However, when we compare those with 130 days or more to the comparison group, the misconduct and recidivism results are not much better, if at all. For the employment outcomes, the participants with 130 days or more in MINNCOR generally fared better than the comparison group. Still, the participants with less than 130 days in MINNCOR had slightly better employment outcomes, except for hourly wage, than those with 130 days or more.

By far, the best outcomes were observed for those who spent a greater proportion of their prison time in MINNCOR. Although the differences for recidivism appear to be minimal, participants who worked a MINNCOR job for 33 percent or more of their confinement periods had less misconduct, they worked more hours after getting released from prisons, and they earned more total wages. The above findings suggest prison labor may have some effects on the outcomes, especially employment, but they do not account for involvement in other programming or the presence and type of post-release supervision. To control for these factors, we estimated a series of multivariate statistical models, which we discuss below.



## The Impact of Prison Labor on Prison Misconduct

As shown in Table 4, the results for the impact of MINNCOR on prison misconduct are mixed. Participation in MINNCOR significantly increased the odds of any misconduct by 37 percent, and it significantly hastened the time to first misconduct, increasing the hazard ratio by 20 percent. Moreover, MINNCOR participation significantly increased the total number of discipline convictions.

**Table 4. Impact of MINNCOR on Prison Misconduct**

	<i>Any Misconduct</i>		<i>Time to 1<sup>st</sup> Misconduct</i>		<i>Total Misconduct</i>	
	Logistic Regression		Cox Regression		Gamma Regression	
	<u>OR</u>	<u>SE</u>	<u>HR</u>	<u>SE</u>	<u>B</u>	<u>SE</u>
MINNCOR	1.366**	0.054	1.196**	0.042	0.275**	0.062
Effective Interventions	0.792**	0.028	0.685**	0.023	-0.339**	0.031
Release Year	1.220**	0.023	1.050**	0.019	0.352**	0.026
MINNCOR Days	1.001**	0.000	0.999**	0.000	0.000	0.000
Effective Interventions	0.791**	0.027	0.677**	0.023	-0.341**	0.031
Release Year	1.210	0.023	1.055**	0.019	0.337**	0.026
MINNCOR Percent	0.440**	0.112	0.439**	0.090	-1.384**	0.127
Effective Interventions	0.771**	0.028	0.663**	0.023	-0.348**	0.031
Release Year	1.220**	0.023	1.046*	0.019	0.321**	0.025
N	6,144		6,144		6,144	

Notes: OR = odds ratio; SE = standard error; HR = hazard ratio

\*\*  $p < .01$

\*  $p < .05$

The number of days in MINNCOR significantly increased the odds of any misconduct, although it was associated with slower times to first misconduct in the Cox regression model. Number of days spent in MINNCOR, however, did not have a significant effect on total misconduct. Percentage of prison time spent in MINNCOR, on the other hand, had a significant impact on all three prison misconduct measures. Increases in the percentage of prison time served in MINNCOR significantly reduced the odds of any misconduct by 56 percent and the hazard of time to first misconduct by 56 percent. Moreover, a greater percentage of time in MINNCOR was associated with fewer

discipline convictions overall.

### The Impact of Prison Labor on Post-Prison Employment

As shown in Table 5, the results for MINNCOR's impact on post-prison employment are generally positive. Participating in MINNCOR significantly increased the likelihood of finding a job in the first year by 24 percent. Within five years of release from prison, participation in MINNCOR still had a significant effect, increasing the odds by 21 percent. Although it did not have a significant effect on hourly wage, MINNCOR significantly increased the number of hours worked and total wages earned.

**Table 5. Impact of MINNCOR on Post-Prison Employment**

	<i>Logistic Regression</i>				<i>Gamma Log-Link GLM</i>					
	One Year		Five Years		Hours Worked		Wages Earned		Hourly Wage	
	<u>OR</u>	<u>SE</u>	<u>OR</u>	<u>SE</u>	<u>B</u>	<u>SE</u>	<u>B</u>	<u>SE</u>	<u>B</u>	<u>SE</u>
MINNCOR	1.238**	0.054	1.209**	0.055	0.173**	0.049	0.175**	0.056	0.001	0.048
Effective Interventions	1.815**	0.030	1.686**	0.031	0.476**	0.026	0.488**	0.030	-0.021	0.022
ISR	1.596**	0.063	1.419**	0.067	0.256**	0.057	0.230**	0.064	0.095	0.052
Discharge	0.735**	0.103	0.911	0.097	-0.203*	0.092	-0.180	0.104	0.106	0.109
Release Year	0.933**	0.022	0.940**	0.022	-0.038*	0.019	-0.042	0.022	0.023	0.019
MINNCOR Days	1.000	0.000	1.000	0.000	0.000	0.000	0.001	0.000	-0.000	0.000
Effective Interventions	1.811**	0.030	1.685**	0.032	0.475**	0.026	0.488**	0.030	-0.021	0.022
ISR	1.583**	0.063	1.411**	0.067	0.248**	0.056	0.220**	0.064	0.095	0.052
Discharge	0.721**	0.103	0.896	0.097	-0.206*	0.091	-0.180	0.104	0.106	0.109
Release Year	0.931**	0.022	0.939**	0.022	-0.040*	0.019	-0.045*	0.021	0.023	0.019
MINNCOR Percent	1.653**	0.106	1.541**	0.109	0.441**	0.099	0.482**	0.111	-0.086	0.095
Effective Interventions	1.839**	0.030	1.705**	0.032	0.490**	0.026	0.505**	0.030	-0.023	0.022
ISR	1.600**	0.063	1.423**	0.067	0.256**	0.057	0.229**	0.065	0.092	0.051
Discharge	0.715**	0.103	0.891	0.097	-0.219*	0.092	-0.186	0.105	0.104	0.109
Release Year	0.933**	0.022	0.939**	0.022	-0.036	0.019	-0.041	0.022	0.022	0.019
N	6,144		6,144		6,144		6,144		6,144	

Notes: GLM = generalized linear model; OR = odds ratio; SE = Standard Error; ISR = intensive supervised release

\*\*  $p < .01$

\*  $p < .05$

The total number of days spent in MINNCOR did not have a significant effect on any of the post-prison employment measures. The percentage of prison time spent in MINNCOR, however, had significant effects on finding employment, number of hours worked, and total wages earned. For example, a one-unit increase in MINNCOR percent increased the odds of finding post-prison employment by 65 percent within the first year

and by 54 percent after five years. A greater percentage of prison time spent working a MINNCOR job was also associated with a significant increase in hours worked and wages earned.

### The Impact of Prison Labor on Recidivism

In Table 6, we present the results from the Cox regression models for each of the four measures of recidivism. Participation in MINNCOR did not have a significant effect on any of the four measures, and the hazard ratio was in the positive direction for all but one of the measures (resentenced). Likewise, days in MINNCOR did not have a significant impact on any of the four recidivism measures.

**Table 6. Impact of MINNCOR on Recidivism**

	<i>Rearrest</i>		<i>Reconviction</i>		<i>Resentenced</i>		<i>Reimprisoned</i>	
	<u>HR</u>	<u>SE</u>	<u>HR</u>	<u>SE</u>	<u>HR</u>	<u>SE</u>	<u>HR</u>	<u>SE</u>
MINNCOR	1.009	0.030	1.030	0.034	0.993	0.040	1.050	0.039
Effective Interventions	0.832**	0.016	0.787**	0.019	0.754**	0.023	0.841**	0.020
ISR	0.919*	0.035	0.806**	0.043	0.899*	0.049	1.738**	0.043
Discharge	1.162**	0.053	1.268**	0.058	1.326**	0.066	0.382**	0.100
Release Year	1.201**	0.014	0.976	0.014	1.013	0.017	1.007	0.017
MINNCOR Days	1.000	0.000	1.000	0.000	1.000	0.000	1.000	0.000
Effective Interventions	0.832**	0.016	0.787**	0.019	0.754**	0.023	0.840**	0.020
ISR	0.918*	0.035	0.804**	0.043	0.899*	0.049	1.732**	0.043
Discharge	1.159**	0.053	1.263**	0.058	1.324**	0.066	0.380**	0.100
Release Year	1.203**	0.014	0.977	0.014	1.015	0.017	1.007	0.017
MINNCOR Percent	0.890*	0.059	0.910	0.068	0.819*	0.080	0.862	0.080
Effective Interventions	0.830**	0.016	0.785**	0.019	0.751**	0.023	0.836**	0.020
ISR	0.916*	0.035	0.803**	0.043	0.896*	0.049	1.730**	0.043
Discharge	1.160**	0.053	1.264**	0.058	1.325**	0.066	0.380**	0.100
Release Year	1.201**	0.014	0.975	0.014	1.013	0.017	1.006	0.017
N	6,144		6,144		6,144		6,144	

Notes: HR = hazard ratio; SE = Standard Error; ISR = intensive supervised release

\*\*  $p < .01$

\*  $p < .05$

The only positive recidivism effects we see are for MINNCOR percent. Here, the hazard ratio is in the negative direction for all four recidivism measures, and the results are significant for two of the measures (rearrested and resentenced). More specifically, a one-unit increase in MINNCOR percent significantly reduced the hazard of rearrest by 11

percent and the hazard of being resentenced to prison for a new felony by 18 percent.

## **DISCUSSION**

To evaluate the effectiveness of prison labor in Minnesota, we used multiple measures of MINNCOR participation to assess the effects on multiple outcomes. The results showed that having a job in prison increased misconduct, yielded beneficial results for employment, but had no impact on recidivism. When we examined the overall amount of time spent in MINNCOR, the results were not much better. Although more days in MINNCOR did not significantly increase two of the misconduct measures, null effects were found for both post-prison employment and recidivism. Positive results for all three outcome measures were observed, however, for those who spent greater proportions of their overall confinement periods working. In general, as the percentage of prison time spent working increased, we found significant improvements in prison misconduct, post-prison employment, and several measures of recidivism.

The findings for employment and recidivism are, to a large extent, consistent with the literature. Existing research has consistently shown that prison labor yields positive post-prison employment outcomes, while the findings have been more mixed for recidivism. Our findings for prison misconduct, however, are different from prior research and were, to some extent, unexpected. While it is unclear why our results diverged from those of prior research, the difference could be due to the more careful, rigorous approach we used to better account for time at risk for misconduct in the comparison group. The difference could also be specific to Minnesota prison labor, which is one limitation to this study. Another drawback is that we did not have data on the reasons why MINNCOR participants ceased working. Knowing whether MINNCOR

participants stopped working because they quit, were terminated, or completed the job could help better explain the prison misconduct results.

Still, our findings hold several broad implications for prison labor and correctional programming in general. First, the “what works” literature offers some clues as to why we found that prison labor did not consistently achieve positive results, especially for misconduct and recidivism. This literature suggests, for example, that employment is a moderate, rather than a major, criminogenic need (Andrews, Bonta, and Wormith, 2006). Moreover, prior studies have found that correctional programming tends to be more effective when it provides a continuum of care or service delivery from prison to the community (Duwe, 2015; Inciardi, Martin, & Butzin, 2004; Lovell, Gagliardi & Phipps, 2005). While prison labor clearly addresses employment needs that prisoners have, which is borne out by its impact on post-prison employment, it is also an intervention that takes place exclusively within the institution. Therefore, unless the “dosage” is extensive, which we discuss below, the impact of prison labor on outcomes such as recidivism may be limited at best.

Second, in a conventional evaluation of correctional programming, treatment participants are compared against non-participants regardless of treatment duration or outcome (e.g., completed, terminated, quit, etc.). Moreover, if we found better outcomes among those who spent more time in the program, it would be reasonable to question whether the findings were due to increased motivation rather than to the treatment itself. Yet, with most correctional programs, there is a point at which participants complete the program, often by achieving some level of mastery over the curriculum. This is clearly not the case for prison labor, which is not a form of programming that prisoners

complete. Instead, as long as employment is available, eligible prisoners frequently work in prison for as long as they can or at least until they get released.

Accordingly, the effects of prison labor may be similar to what has been observed for post-prison employment. Previous research has found that simply finding a job following release from prison does not necessarily lead to less recidivism. Rather, when it comes to reducing reoffending, maintaining post-prison employment is what appears to be critical (Duwe and Clark, 2014). Similarly, merely having a job in prison may not yield the best outcomes. Instead, as time spent in prison labor increases, especially in relation to the length of an individual's overall prison term, the better the results for outcomes such as institutional misconduct and recidivism.

Finally, the varying effects of prison labor "dosage" on misconduct, employment and recidivism suggest that how individuals spend their time in prison matters. More time in prison labor did not translate to significantly better outcomes, for the analyses examining the overall number of days in MINNCOR neither accounted for the length of stay in prison nor the timing of participation. But when we looked at the percentage of confinement time spent in MINNCOR, we found the best outcomes for those whose time in prison was increasingly occupied with work. Put another way, if we compared an individual who worked 150 out of 1,000 days in prison with another individual who worked 150 out of 300 days in prison, our results suggest that, all else being equal, we should expect to see better outcomes for the latter individual.

These results dovetail, to some extent, with findings from recent research on Minnesota prisoners that has looked at the effects of warehousing and program participation on recidivism. Duwe and Clark (2017b) found, for example, that greater

involvement in effective programming significantly decreased recidivism, while reoffending was significantly higher when prisoners were “warehoused” (i.e., “idle” prisoners who did not participate in any programming while imprisoned). Likewise, in this study, we found much better outcomes for individuals who spent more of their time working in prison.

This evaluation adds to the relatively sparse and mostly outdated prison labor literature. To be sure, more evaluations are needed that examine the effects of prison labor in other jurisdictions on outcomes such as institutional misconduct, post-prison employment, and recidivism. Yet, the cost-effectiveness of prison labor is one outcome we did not examine that warrants greater scrutiny in the future. Prison labor has long been controversial for a variety of reasons, but recent critiques have alleged that it relies on unfair competitive advantages, such as paying low wages to inmate workers, to take both business and jobs away from law-abiding citizens in the private sector. This issue was beyond the scope of this evaluation, but future research is needed to estimate the overall cost-effectiveness of prison labor and whether it has an impact on local economies.

## REFERENCES

- Becker, G. S. (1968). Crime and punishment: an economic approach. *Journal of Political Economy*, 76, 169–217.
- Berg, M. T., & Huebner, B. M. (2010). Reentry and the ties that bind: An examination of social ties, employment and recidivism. *Justice Quarterly*, 28, 382-410.
- Bucklen, K. B., & Zajac, G. (2009). But some of them don't come back (to prison!): Resource deprivation and thinking errors as determinants of parole success and failure. *The Prison Journal*, 89, 3, 239-264.
- Caudy, M.S., Durso, J.M., & Taxman, F.S. (2013). How well do dynamic needs predict recidivism? Implications for risk assessment and risk reduction. *Journal of Criminal Justice*, 41, 458-466.
- Cloward, R., & Ohlin, L. (1960). *Delinquency and opportunity*. New York: Free Press.
- Cohen, L., & Felson, M. (1979). Social change and crime rates. *American Sociological Review*, 44, 588–608.
- Colvin, M. (1992). *The penitentiary in crisis: From accommodation to riot in New Mexico*. Albany: State University of New York Press.
- Cornish, D. B., & Clarke, R. V. (1986). *The reasoning criminal*. New York: Springer.
- Duwe, G. (2010). Prison-based chemical dependency treatment in Minnesota: An outcome evaluation. *Journal of Experimental Criminology*, 6, 1, 57-81.
- Duwe, G. (2012). Evaluating the Minnesota Comprehensive Offender Reentry Plan (MCORP): Results from a randomized experiment. *Justice Quarterly*, 29, 3, 347-383.
- Duwe, G. (2013). *What works with Minnesota prisoners: A summary of the effects of correctional programming on recidivism, employment and cost avoidance*. St.



- Paul: Minnesota Department of Corrections.
- Duwe, G. (2014). The development, validity, and reliability of the Minnesota Screening Tool Assessing Recidivism Risk (MnSTARR). *Criminal Justice Policy Review*, 25: 579-613.
- Duwe, G. (2015). The benefits of keeping idle hands busy: An outcome evaluation of a prisoner reentry employment program. *Crime and Delinquency*, 61, 4, 559-586.
- Duwe, G., & Clark, V. A. (2013). Blessed be the social tie that binds: The effects of prison visitation on offender recidivism. *Criminal Justice Policy Review*, 24, 3, 271-296.
- Duwe, G., & Clark, V. A. (2017a). Nothing will work unless you did: The predictors of postprison employment. *Criminal Justice and Behavior*, 44, 5, 657-677.
- Duwe, G., & Clark, V. A. (2017b). The rehabilitative ideal versus the criminogenic reality: The consequences of warehousing prisoners. *Corrections: Policy, Practice and Research*, 2, 41-69.
- Duwe, G., & King, M. (2013). Can faith-based correctional programs work? An outcome evaluation of the InnerChange Freedom Initiative in Minnesota. *International Journal of Offender Therapy and Comparative Criminology*, 57, 7, 813-841.
- Farrington, D., Gallagher, B., Morley, L., St. Ledger, R. and West, D. (1986). Unemployment, school leaving and crime. *British Journal of Criminology*, 26, 335-356.
- French, S. A., & Gendreau, P. (2006). Reducing prison misconducts: What works! *Criminal Justice and Behavior*, 33, 2, 185-218.
- Gaes, G. G., & McGuire, W. J. (1985). Prison violence: The contribution of crowding versus other determinants of prison assault rates. *Journal of Research in Crime*

- and Delinquency*, 22, 1, 41-65.
- Gover, A. R., Perez, D. M., & Jennings, W. G. (2008). Gender differences in factors contributing to institutional misconduct. *The Prison Journal*, 88, 3, 378-403.
- Horney, J., Osgood, D. W., & Marshall, I. H. (1995). Criminal careers in the short-term: Intra-individual variability in crime and its relation to local life circumstances. *American Sociological Review*, 60, 655-673.
- Huiras, J., Uggen, C., & McMorris, B. (2000). Career jobs, survival jobs, and employee deviance: A social investment model of workplace misconduct. *The Sociological Quarterly*, 41, 245-263.
- Inciardi, J.A., Martin, S.S., Butzin, & Butzin, C.A. (2004). Five-year outcomes of therapeutic community treatment of drug-involved offenders after release from prison. *Crime & Delinquency*, 50, 88-107.
- Jang, S.J., Johnson, B.R., Hays, J., Hallett, M., & Duwe, G. (2017). Religion and misconduct in “Angola” prison: Conversion, congregational participation, religiosity, and self-identities. *Justice Quarterly*.  
<https://doi.org/10.1080/07418825.2017.1309057>
- Kornhauser, R. (1978). *Social sources of delinquency: An appraisal of analytic models*. Chicago: University of Chicago Press.
- Lageson, S., & Uggen, C. (2013). How work affects crime - and crime affects work - over the life course. In C. L. Gibson & M. D. Krohn (Eds.), *Handbook of Life-Course Criminology: Emerging Trends and Directions for Future Research*, pp. 201-212. New York: Springer.
- Lovell, D., Gagliardi, G.J., Phipps, P. (2005). *Washington's Dangerous Mentally Ill*

- Offender Law: Was Community Safety Increased?* Olympia, WA: Washington State Institute for Public Policy.
- Maguire, K. E., Flanagan, T. J., & Thornberry, T. P. J. (1988). Prison labor and recidivism. *Journal of Quantitative Criminology*, 4, 3-18.
- McCorkle, R. C., Miethe, T. D., & Drass, K. A. (1995). The roots of prison violence: A test of the deprivation, management, and “not-so-total” institution models. *Crime & Delinquency*, 41, 3, 317-331.
- Merton, R. K. (1938). Social structure and anomie. *American Sociological Review*, 3, 672–682.
- Northcutt Bohmert, M., & Duwe, G. (2012). Minnesota’s Affordable Homes Program: Evaluating the effects of a prison work program on recidivism, employment, and cost avoidance. *Criminal Justice Policy Review*, 23, 327-351.
- Osgood, D. W., Wilson, J. K., O’Malley, P. M., Bachman, J. G., & Johnston, L. D. (1996). Routine activities and individual deviant behavior. *American Sociological Review*, 61, 4, 635-655.
- Raphael, S. (2010). Improving employment prospects for former prison inmates: Challenges and policy. In P. J. Cook, J. Ludwig, & J. McCrary (Eds.), *Controlling Crime: Strategies and Tradeoffs*, pp.521-572. Chicago: University of Chicago Press.
- Richmond, K. M. (2014). The impact of federal prison industries employment on the recidivism outcomes of female inmates. *Justice Quarterly*, 31, 4, 719-745.
- Rosenbaum, P.R., & Rubin, D.B. (1984). Reducing bias in observational studies using subclassification on the propensity score. *Journal of the American Statistical*

- Association*, 79, 516-524.
- Rosenbaum, P.R., & Rubin, D.B. (1985). Constructing a control group using multivariate matched sampling methods that incorporate the propensity score. *The American Statistician*, 39, 33-38.
- Rubin, D.B. (1997). Estimating causal effects from large data sets using propensity scores. *Annals of Internal Medicine*, 127, 757-763.
- Sampson, R. J., & Laub, J. H. (1993). *Crime in the making: pathways and turning points through life*. Cambridge, MA: Harvard University Press.
- Saylor, W. G., & Gaes, G. G. (1997). Training inmates through industrial work participation and vocational and apprenticeship instruction. *Corrections Management Quarterly*, 1, 2, 32-43.
- Shadish, W. R., Cook, T. D., & Campbell, D. T. (2002). *Experimental and quasi-experimental designs for generalized causal inference*. Boston: Houghton Mifflin.
- Skardhamar, T., & Telle, K. (2012). Post-release employment and recidivism in Norway. *Journal of Quantitative Criminology*, 28, 629-649.
- Steiner, B., & Wooldredge, J. (2008). Inmate versus environmental effects on prison rule violations. *Criminal Justice and Behavior*, 35, 4, 438-456.
- Steiner, B., & Wooldredge, J. (2014). Sex differences in the predictors of prisoner misconduct. *Criminal Justice & Behavior*, 41, 4, 433-452.
- Uggen, C. (1999). Ex-offenders and the conformist alternative: A job quality model of work and crime. *Social Problems*, 46, 127-151.
- Uggen, C., & Staff, J. (2001). Work as a turning point for criminal offenders. *Corrections Management Quarterly*, 5, 4, 1-16.

- Visher, C. A., Debus-Sherrill, S. A., & Yahner, J. (2011). Employment after prison: A longitudinal study of former prisoners. *Justice Quarterly*, 28, 698-718.
- Wilson, D.B., Gallagher, C.A., & MacKenzie, D.L. (2000). A Meta-Analysis of Corrections-Based Education, Vocation, and Work Programs for Adult Offenders. *Journal of Research in Crime and Delinquency*, 37, 347-368.
- Wolfgang, M., Figlio, R., & Sellin, T. (1972). *Delinquency in a birth cohort*. Chicago: University of Chicago Press.
- Wooldredge, J. (1994). Inmate crime and victimization in a southwestern correctional facility. *Journal of Criminal Justice*, 22, 367-381.
- Wooldredge, J. (1998). Inmate lifestyles and opportunities for victimization. *Journal of Research in Crime and Delinquency*, 35, 480-502.