Recidivism Rates of Juvenile Correctional Center Educational Credential Earners and Career and Technical Education Class Completers

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ABSTRACT

Research studies have found that residents in juvenile and adult facilities who participate in correctional education are less likely to reoffend, but research on juveniles is limited. While committed to the Department of Juvenile Justice, residents may earn academic credits for a high school diploma, prepare for and complete a General Education Development (GED) credential, and participate in Career and Technical Education (CTE) vocational training. Based on rearrest and reconviction rates and logistic regression models examining 1,337 residents released from juvenile correctional centers (JCCs) in fiscal years (FY) 2009-2010, juveniles who earned diplomas while in JCCs were less likely to reoffend within one year. This relationship was especially true for juveniles who were 18 or older at the time of release. Earning a GED while in a JCC did not have a statistically significant relationship with rearrest or reconviction. Completing a CTE course in a JCC was related to a lower likelihood of reoffending, regardless of age at release.

LITERATURE REVIEW

Education is an important part of programming within adult correctional centers and juvenile correctional centers (JCCs). It allows residents to complete high school degrees, earn General Education Development (GED) credentials, take post-secondary courses, and learn vocational skills that may assist them in finding a job after release. Furthermore, research studies have found that residents in juvenile and adult facilities who participate in correctional education programs are less likely to reoffend (Esperian, 2010; Katsiyannis, Ryan, Zhang, & Spann, 2008).

A number of research studies have been conducted in adult prisons and jails on the relationship between correctional education programs and recidivism (Esperian, 2010). A study by the Correctional Education Association observed that adult inmates in Maryland, Minnesota, and Ohio who participated in correctional education were rearrested, reconvicted, and reincarcerated at significantly lower rates than inmates who did not participate (Steurer & Smith, 1997).

The relationship between earning a GED and criminal behavior is more varied. For instance, a 2003 report by the Correctional Education Association found that inmates who earned a GED were substantially less likely to return to custody within three years; the study found that this effect was especially prominent for inmates 21 years of age or younger at the time of release (Nuttall, 2003). However, a 2006 study of low-income minority youth in Chicago found that the crime rates of GED-earners and high school dropouts were not significantly different (Ou, 2008), and similar studies found that earning a GED was not associated with the same labor market success as earning a high school diploma (Heckman & LaFontaine, 2006).

Fewer studies have been conducted to examine the relationship between correctional education programs and juvenile offender recidivism; however, the existing literature reflects many similarities to research in the adult system: lower levels of academic achievement are correlated with a higher likelihood of recidivism (Katsiyannis, et al., 2008). Studies have evaluated the effectiveness of additional educational programming and wraparound services within the facilities, finding that both reduce the probability of reoffending (Carney & Butell, 2003; Williams, 1996). For example, a study of 531 juveniles released from the Oregon juvenile correctional system found that those who were released and returned to school or began working in a job were less likely to return to confinement within 12 months (Bullis, Yovanoff, Mueller, & Havel, 2002).

CORRECTIONAL EDUCATION AT THE DEPARTMENT OF JUVENILE JUSTICE

On July 1, 2012, the Virginia Department of Juvenile Justice (DJJ) became the operational agency for providing educational services to committed juveniles when the Virginia Department of Correctional Education (DCE) was abolished and the juvenile educational and vocational programs merged with DJJ. These services are now administered in the JCCs by the DJJ Division of Education. While committed, residents may earn academic credits for a high school diploma, prepare for and complete a GED, and participate in Career and Technical Education (CTE) vocational training. The DJJ direct care budget for fiscal year (FY) 2013, excluding the Reception and Diagnostic Center, was $68,681,886, with $15,532,236 (approximately 23%) dedicated to the Division of Education.

STATEMENT OF THE PROBLEM

DJJ routinely calculates recidivism rates for juveniles released from the JCCs but had never examined recidivism rates for the educational programs previously operated by DCE. After the merger, DJJ administration and community stakeholders requested this information. An analysis was completed to provide preliminary data on recidivism rates for juveniles earning a high school diploma or GED and completing CTE training while in a JCC.

While this study examines the relationship between educational programs and recidivism, it is not a program evaluation. DJJ does not have the appropriate test and control groups needed to analyze the effectiveness of educational services in the JCCs. The results of the study show the correlation between educational programs and recidivism but do not assume causation. The likelihood to reoffend can be influenced by any number of factors that are not addressed in this study. Further analyses are being planned to investigate the relationship more closely and to evaluate the effectiveness of educational services.

This analysis will create a foundation for future data collection practices and analyses on the relationship between recidivism and education as it relates to program effectiveness. Through this analysis, DJJ will be able to provide baseline recidivism rates to compare in future years and will create a foundation for evaluating the quality of specific DJJ educational and vocational programs.

METHODS

DATA

The data used in this study were collected from two separate data systems: one from DJJ and one from DJJ's Division of Education. The data was then merged by unique juvenile number identifiers used by both DJJ and the Division of Education, names, and dates of birth[1].

Data on 1,452 juveniles released in FY 2009-2010 were collected from DJJ's database. Data included the following variables:

- Name
- Unique juvenile number identifier used by DJJ and the Division of Education
- Date of birth
- Sex
- Race
- Age at release
- Released to parole (yes/no)

[1] Data collected by DJJ and data collected by DJJ's Division of Education are not fully comparable due to the use of different unique identifiers. The Division of Education used a combination of student testing identification numbers (STI) issued by the state Department of Education and juvenile numbers issued by DJJ as unique identifiers. For two of the years included in this analysis, juveniles had only STI numbers with no JTS numbers in the Division of Education's data. Juveniles had to be matched using name and date of birth, if available. Due to this method, the data may contain matching errors.

- Classification level at admission
- Classification level at release
- Rearrest date (if applicable)
- Days from release to rearrest (if applicable)
- Reconviction date (if applicable)
- Days from release to reconviction (if applicable)

Names and unique juvenile number identifiers of students who earned diplomas, earned GEDs, and completed CTE classes[2] while in a JCC were collected from DJJ's Division of Education for school years 2005-2006 through 2009-2010 to match with the data from DJJ's database. The Division of Education tracked juveniles by school year enrollment while DJJ tracked juveniles by admission or release date in FYs. In order to ensure that all school years in which a juvenile could have earned a credential or completed a course were captured in the analysis, three school years prior to the FY in which the juvenile was released were included in the analysis. Data was collected for the minimum of three years prior to release because the maximum length of stay for most juveniles is 36 months. For example, a juvenile may have been admitted in July 2005 (FY 2006), earned a credential in December 2005 (FY 2006; school year 2005-2006), and then released in June 2009 (FY 2009). He would appear in the FY 2009 sample in the DJJ database, but the CTE completion record would appear in the 2005-2006 school year in the Division of Education database.

In order to make race a binary variable for the statistical analysis, black and white were the only races included in this study. In the original dataset, 115 (7.9%) juveniles were not white or black and were excluded. The remaining 1,337 juveniles comprised the sample used in this analysis.

Of those in the sample, 92.7% of juveniles were male, and 7.3% were female. 71.5% of juveniles in the sample were black, and 28.5% were white. The age range of the juveniles in the sample at the time of release was 13 to 20 years old. 23.6% of juveniles in the sample were 16 years old or younger, 30.4% were 17 years old, 28.8% were 18 years old, and 17.2% were 19 or 20 years old.

In addition to examining the total sample, a subsample of 615 juveniles who were 18 years of age or older at the time of release was used. Juveniles released without a GED or diploma may re-enroll in school and earn a credential in the community; juveniles under the age of 18 are subject to compulsory school attendance requirements. In order to exclude juveniles more likely to re-enroll after release due to the compulsory school requirements, rearrest and reconviction rates were calculated excluding juveniles who were under the age of 18 at the time of release. It was assumed that juveniles 18 or older were less likely to re-enroll in academic programs after release because they were over-age by high school standards and not legally required to be in school.

Table 1 shows the recidivism rates for juveniles in the sample by the FY in which they were released. Juveniles ages 18 or older at the time of release are listed along with all releases.

[2] Successful CTE completions include any resident who completes 80% of a CTE course, has a passing grade, and completed required seat time.

TABLE 1. REARREST AND RECONVICTION RATES, FY 2009-2010 JCC RELEASES SAMPLE[3]

	All Releases		Releases 18+	
	Rearrest	Reconviction	Rearrest	Reconviction
2009	49.7%	36.6%	45.0%	34.4%
2010	46.1%	34.4%	43.1%	33.0%

Each juvenile was given a binary value (1 = yes, 0 = no) for four independent variables measuring educational attainment: a) high school diploma earned, b) GED earned, c) no credential earned, and d) CTE course completed. Likewise, the days to rearrest and days to reconviction data were used to calculate binary values (1 = yes, 0 = no) for two dependent variables: a) rearrest within one year of release and b) reconviction within one year of release.

STATISTICAL ANALYSIS

Logistic regression models were created to test the relationship between educational attainment within a JCC and rearrest and reconviction within one year. The independent variables included in the models are shown in Table 2. The non-educational data collected from DJJ's database were included to serve as control variables but were also tested for a relationship with the dependent variables of rearrest and reconviction within one year.

TABLE 2. INDEPENDENT VARIABLE LIST

Variable	Description	Numerical Value
Sex	Male or female	1 - male, 0 - female
Race	Black or white; all other races excluded	1 - black, 0 - white
Age at release	Age at the time of release from a JCC	13 - 20
Released to parole	Parole status at the time of release from a JCC	1 - released to parole, 0 - not released to parole
Classification level at admission	DJJ operates an objective classification system to assess juveniles' appropriate security and custody levels. Class levels range from 1 to 4 with 1 being the lowest security level and 4 being the highest. This variable is the juvenile's classification level when admitted to a JCC.	1 - 4
Classification level at release	Same classification system as explained in *Classification level at admission*. This variable is a juvenile's classification level at the time of release from a JCC.	1 - 4
GED	GED status according to Division of Education records	1 - earned a GED, 0 - did not earn a GED

[3] Data in this table is not comparable to data presented in other reports because of the exclusion of juveniles of other races in this study. The table shows only the recidivism rates of juveniles included in this study who were released in FY 2009-2010.

Diploma	High school diploma status according to Division of Education records	1 - earned a diploma, 0 - did not earn a diploma
No credentials	Credential status according to Division of Education records	1 - no credentials, 0 – earned credentials in JCC (diploma and/or GED)
CTE completion	CTE course completion according to Division of Education records	1 - completed a CTE course, 0 - did not complete a CTE course

Four models were created using forward conditional logistic regression. A forward conditional model calculates the equation by adding each variable to the model one at a time and discarding variables that do not have a statistically significant relationship with the dependent variable, resulting in a final model with all statistically significant independent variables. The four models tested a) rearrest and earning a credential (GED or diploma), b) reconviction and earning a credential, c) rearrest and completing a CTE course, and d) reconviction and earning a CTE course. Credentials and CTE course completion were tested separately because juveniles can complete a CTE course with or without earning a credential. Each model was also completed using the subsample of juveniles 18 years of age or older at the time of release.

RESULTS

BASIC RECIDIVISM RATE COMPARISONS

Rates presented in Tables 3 and 4 show that juveniles who earned a diploma during their stay in a JCC had rearrest and reconviction rates lower than both juveniles who earned a GED and juveniles who did not earn a credential. These differences were larger in the analysis for juveniles released at 18 years of age or older. Additionally, juveniles who earned a GED while in a JCC had rearrest and reconviction rates lower than juveniles who did not earn a credential.

TABLE 3. CREDENTIAL REARREST RATES, FY 2009-2010 JCC RELEASES SAMPLE

	All Releases			Releases 18+		
	Diploma	GED	No Credential	Diploma	GED	No Credential
2009	28.6%	48.8%	52.3%	22.2%	47.2%	49.1%
2010	37.8%	39.4%	49.0%	30.0%	37.4%	50.0%

TABLE 4. CREDENTIAL RECONVICTION RATES, FY 2009-2010 JCC RELEASES SAMPLE

	All Releases			Releases 18+		
	Diploma	GED	No Credential	Diploma	GED	No Credential
2009	19.6%	35.9%	38.7%	11.1%	32.7%	42.4%
2010	26.7%	32.1%	35.5%	20.0%	28.0%	39.0%

Rates presented in Tables 5 and 6 show that juveniles who completed CTE courses during their stay in a JCC had rearrest and reconviction rates lower than those who did not complete CTE courses. Similar differences existed when examining juveniles 18 years of age or older at release.

TABLE 5. CTE REARREST RATES, FY 2009-2010 JCC RELEASES SAMPLE

	All Releases		Releases 18+	
	Completed CTE	Did Not Complete	Completed CTE	Did Not Complete
2009	42.7%	52.7%	37.2%	50.7%
2010	34.1%	50.3%	35.1%	48.1%

TABLE 6. CTE RECONVICTION RATES, FY 2009-2010 JCC RELEASES SAMPLE

	All Releases		Releases 18+	
	Completed CTE	Did Not Complete	Completed CTE	Did Not Complete
2009	32.6%	38.3%	27.6%	39.4%
2010	22.7%	38.5%	24.6%	38.3%

CREDENTIAL STATISTICAL ANALYSIS

Table 7 shows the results from the four logistic regression models in terms of odds ratios. Odds ratios indicate how much more likely a juvenile with that characteristic is to be rearrested or reconvicted within one year than juveniles without that characteristic. For instance, the table below indicates that when examining all releases, males are 2.8 times more likely to be rearrested than females and 3.0 times more likely than females to be reconvicted within one year.

TABLE 7. CREDENTIAL ODDS RATIOS FROM LOGISTIC REGRESSION MODELS

	Rearrest		Reconviction	
	All Releases	Releases 18+	All Releases	Releases 18+
No Diploma	1.6	2.3	----	3.0
Male	2.8	2.4	3.0	2.8
Released to Parole	2.6	2.1	2.8	2.3
Higher Classification Level at Release	1.3	1.4	1.3	1.2
Black	1.8	----	1.4	----
Age at Release	----	N/A	----	N/A
Higher Classification Level at Admission	----	----	----	----
No GED	----	----	----	----
No Credential	----	----	----	----

Diploma, sex, released to parole, classification level at release, and race had a significant relationship with rearrest or reconviction in at least one model. Age at release, classification level at admission, GED,

and no credential were not significant in any models. (Age at release was not tested as a variable in the model for juveniles 18 or older since age was used as the exclusion criterion.)

Based on logistic regression model coefficients, earning a diploma had a negative relationship with rearrest and reconviction, meaning that if a juvenile earned a diploma while in a JCC, his or her likelihood of being rearrested or reconvicted decreased. Because positive odds ratios are presented in the table for all variables, odds ratios for juveniles who did ***not*** earn a diploma are shown above. Juveniles who did not earn a diploma while in a JCC were 1.6 times more likely to be rearrested within one year. Juveniles 18 years of age or older at the time of release who did not earn a diploma were 2.3 times more likely to be rearrested and 3.0 times more likely to be reconvicted within one year.

Although juveniles who earned a GED while committed had slightly lower recidivism rates than those with no credentials, as presented in the "Basic Recidivism Rate Comparisons" section, the logistic regression models indicated that the two groups were not statistically different; therefore, the lower rates may have been due to chance.

While there were some consistencies between all the models, there were some differences. Most notably, earning a diploma reduced the likelihood of being rearrested for all releases, and the relationship was stronger for juveniles 18 years of age or older. Earning a diploma did not reduce the likelihood of being reconvicted for all releases, but the variable had the strongest predictive relationship for juveniles 18 years of age or older. The odds ratios for most of the other significant independent variables, however, decreased from the models for all releases to the models for juveniles 18 years of age or older. In fact, race was no longer statistically significant when juveniles under 18 years of age at the time of release were excluded.

CTE STATISTICAL ANALYSIS

Table 8 shows the results of the four models for CTE completion in terms of odds ratios that were calculated from the logistic regression coefficients.

TABLE 8. CTE ODDS RATIOS FROM LOGISTIC REGRESSION MODELS

	Rearrest		Reconviction	
	All Releases	Releases 18+	All Releases	Releases 18+
Male	2.9	2.4	3.2	2.8
Released to Parole	2.6	2.2	2.8	2.4
No CTE Completion	1.8	1.6	1.6	1.6
Higher Classification Level at Release	1.3	1.4	1.3	1.2
Black	1.8	1.5	1.5	----
Age at Release	----	N/A	----	N/A
Higher Classification Level at Admission	----	----	----	----

The variables sex, released to parole, CTE completion, classification level at release, and race had significant relationships with rearrest and reconviction within one year in most of the models. Age at release and classification level at admission were not significant in any models. (Age at release was not tested as a variable in the model for juveniles 18 years of age or older since it was used as the exclusion criterion.)

Juveniles who did not complete a CTE course while in a JCC were 1.8 times more likely to be rearrested and 1.6 times more likely to be reconvicted within one year. Juveniles 18 or older at the time of release who did not complete a CTE course were 1.6 times more likely to be rearrested and 1.6 times more likely to be reconvicted within one year.

DISCUSSION

CREDENTIAL ANALYSIS

Based on the recidivism rates and logistic regression models, juveniles who earned diplomas while in a JCC were significantly less likely to be rearrested or reconvicted within one year. Earning a diploma had a stronger relationship with recidivism for juveniles released at 18 years of age or older. Furthermore, earning a diploma mitigated the effects of most other independent variables for juveniles 18 years of age or older. In fact, race was no longer statistically significant when juveniles under 18 years of age at the time of release were excluded. Assuming the models for juveniles 18 years of age and older exclude most juveniles who may re-enroll in high school or a GED program after release, the models for juveniles 18 years of age or older provide a more accurate depiction of the relationship between earning a credential and recidivism.

Earning a GED while in a JCC did not have a statistically significant relationship with rearrest or reconviction. This finding supports the previous research showing that earning a GED does not result in the same benefits as earning a high school diploma. For this reason, many national organizations and local education agencies promote earning a high school diploma over a GED.

CTE ANALYSIS

The CTE completion analysis showed that juveniles who completed CTE courses while in a JCC were rearrested and reconvicted at significantly lower rates than those who did not complete a CTE course. Unlike earning a diploma, the relationship between CTE completion and rearrest and reconviction was not stronger in the model for juveniles 18 years of age or older.

These results indicate that completing a CTE course in a JCC is related to a lower likelihood of reoffending, regardless of age at release. The odds ratios for the other independent variables remained relatively stable with the exception of race, which was no longer significant in the reconviction model for juveniles 18 years of age or older at the time of release.

LIMITATIONS

A number of limitations should be taken into consideration when applying these findings to the JCC population. If a juvenile had a longer length of stay than 36 months, his or her educational data may not be captured in this analysis. In addition, the data may contain errors resulting from data entry or the merging of the two data systems.

This analysis also does not accurately account for juveniles who are released from JCCs without a diploma or GED who re-enroll in school and complete their credentials in the community. Based on the literature mentioned above, these juveniles may be less likely to reoffend than those who never earn credentials. However, in this analysis, they were included in the group for juveniles who did not complete a credential while in a JCC. In an attempt to mitigate the effect of this limitation, an analysis focusing on a subsample of juveniles released at age 18 or older was also completed. Examining only

juveniles 18 years of age or older yielded a stronger relationship between earning a diploma and not reoffending, but some juveniles released at age 18 or older may continue their schooling and earn a credential after release, and some juveniles released before age 18 may never earn a credential. Moreover, excluding all juveniles released under the age of 18 reduced the sample size by more than half, and a smaller sample size makes the findings less generalizable to larger populations.

The CTE analysis is limited because courses offered in the JCCs differ based on the course and the curriculum. While all courses are 36 weeks long, some may be completed within an 18-week timeframe. Industry-based certifications may be obtained after completion of certain CTE courses if students also complete the additional requirements of that industry certification area. Courses are offered in approximately 26 different trade areas, including marketing, horticulture, culinary arts, and barbering. Due to the variation, some courses may have more or less of relationship with recidivism, making the findings difficult to generalize to the entire CTE program.

As previously mentioned, it should also be taken into consideration that this analysis is not an evaluation of educational programming within the JCCs. It does not review the quality or efficacy of educational and vocational programs. It only looks at the relationship between earning a diploma or GED or completing a CTE course and the rate of reoffending within one year of release from a JCC. Conclusions cannot be drawn from this study that educational programming within the JCCs makes juveniles more or less likely to reoffend. Many other factors that contribute to a juvenile's ability to earn a diploma, such as work ethic or intellectual functioning, may have an effect on success after release.

CONCLUSION

The results of this study serve as a preliminary analysis of DJJ's educational data. The findings were consistent with literature on the relationship between educational attainment and recidivism within the juvenile justice system for credential earners and CTE completers. The knowledge gained about DJJ's population from this study creates a foundation for further research on the topic of education and recidivism. DJJ is working to incorporate its educational data into its current database along with all other juvenile information. Once this process is completed, a more accurate analysis of recidivism and educational attainment may be possible.

Additionally, this study reveals the need for program evaluations within DJJ's correctional education programs in order to determine the effectiveness of a program rather than its correlation to recidivism, providing concrete evidence for policy and funding decisions. While this preliminary study of educational data revealed new information about DJJ's population, more research is needed on the topic of education and recidivism.

GLOSSARY

Binary Variable – a variable with only two possible values (e.g., the variable sex has the two possible values of male and female).

CTE Completions – residents who completed 80% of a CTE course, had a passing grade, and completed required seat time. The length of courses and certification availability varies among the disciplines.

Causation – the relationship between two events or variables in which the second event or variable is a consequence of the first. A correlation between two variables does not indicate causation.

Control Group – research participants who do not receive the treatment or program being tested. It is important for the individuals to be randomly assigned to the control group or for the control group to have similar characteristics to the test group in order to conclude effectiveness of the treatment or program (i.e., causation). A control group may also be called a comparison group. A control group is not possible in this study because those juveniles who participate in educational programs may not have the same characteristics as the juveniles who do not participate.

Correlation – the degree of association between two variables. Correlation does not imply causation; it shows a relationship that may or may not be influenced by any number of other variables (e.g., height and basketball ability are usually correlated. Taller people are generally better at basketball; however, this does not mean that being tall always indicates that one plays basketball well). A correlation can be positive or negative.

Credentials – high school diplomas and GED certificates. High school diplomas include all types of Virginia Department of Education-approved diplomas: special, modified standard, standard, and advanced.

Dependent Variable –the observed variable whose changes are determined by the presence or degree of one or more independent variables. Dependent variables may also be called outcome variables.

Independent Variable –a manipulated variable whose presence or degree determines the change in a dependent variable. Independent variables may also be called predictor variables.

Logistic Regression – a statistical technique for estimating the relationships among variables used specifically for predicting the outcome of a binary dependent variable.

Odds Ratio – a measure of effect size describing the strength of association between two variables.

Rearrest – a petitioned juvenile complaint, warrant, or summons for a new criminal offense made at intake or an adult arrest, warrant, or summons for a new criminal offense within one year of release from a JCC.

Reconviction – an adjudication of delinquency for a delinquent act or a guilty conviction for a criminal offense where the rearrest occurred within one year of release from a JCC.

Reincarceration – a return to confinement in a JCC, adult correctional center, or adult jail subsequent to rearrest and reconviction on a new delinquent or criminal offense within one year of release from a JCC. Reincarceration is not used as a dependent variable in this study because a small percentage of juveniles are reincarcerated within one year of release, and a binary dependent variable that is not evenly distributed between values can cause complications with the validity of the statistical model.

Statistical Significance – a mathematical concept used to determine whether the outcome of an experiment is likely the result of a relationship between variables or the result of chance. If the p-value (i.e., the probability that the observations occurred due to chance) is less than the standard significance level of .05, then there is 95% confidence that the outcome was due to a relationship instead of chance.

Test Group – research participants who receive treatment or program being tested. It is important for the individuals to be randomly assigned to the test group or for the test group to have similar characteristics to the control group in order to conclude effectiveness of the treatment or program (i.e., causation). A test group may also be called a treatment group. A test group is not possible in this study because those juveniles who participate in educational programs may not have the same characteristics as the juveniles who do not participate.

Variable – an operationally defined attribute (e.g., in this study, the variable of reconviction was operationally defined as an adjudication of delinquency for a delinquent act or a guilty conviction of a criminal offense within one year of release from a JCC).

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