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THE EFFECTS OF EDUCATION ON YOUTH CRIME PARTICIPATION USING SELF- REPORTED DATA FROM NLSY97

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THE EFFECTS OF EDUCATION ON YOUTH CRIME PARTICIPATION USING
SELF-REPORTED DATA FROM NLSY97

A Thesis
Presented to
the Graduate School of
Clemson University

In Partial Fulfillment
of the Requirements for the Degree
Master of Arts
Economics

by
Aiwei Mao
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Accepted by:
Dr. Robert D. Tollison, Committee Chair
Dr. Scott L. Baier
Dr. Daniel Wood

ABSTRACT

This paper empirically examines the impacts of education on crime participation among youth aged between 18 -24, using data from National Longitudinal Survey of Youth 97(NLSY97). First, it estimates the reduction effects of high school graduation on general crime participation, which shows significant negative effects. Then this paper predicts the effects of high school graduation on three types of crime. A robust finding is that all of the three types of crimes are negative associated with high school graduation whether or not controlling family background and cognitive skill. Also, this paper classifies education level into three levels and predicts the effects of crime participation for each education level. The results reflect that more higher education level has larger crime reduction effects than lower education level. In order to check the robustness of the findings above, this paper explores the effects of high school graduation and ability on incarceration. The implications of these findings are clear and could give policy suggestion. That is, improving education could exert a key policy tool to reduce crime.

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TABLE OF CONTENTS

	Page
TITLE PAGE	i
ABSTRACT	ii
ACKNOWLEDGMENTS	iii
CHAPTER	
I. INTRODUCTION	1
II. LITERATURE REVIEW	3
III. DATA	6
IV. MODEL AND MOTHEDED.....	10
V. RESULTS	13
VI. CONCLUSION.....	17
REFERENCES	35

LIST OF TABLES

Table		Page
1	Crime Category	8
2	Crime Participation Rate of 2004	8
3	Summary Statistics.....	20
4	Probit Estimates of High School Graduation on Crime Participation.....	21
5	Marginal Effects of High School Graduation on Crime Participation.....	23
6	Estimates the effects of high school graduation on violent crime, drug crime an property crime.....	25
7	Probit estimates of the effects of different education level on three types of crime.....	26
8	Marginal Effects estimates of the effects of different education level on three types of crime.....	28
9	Probit Estimate the effects of high school graduation on incarceration.....	29
10	Marginal Effects the effects of high school graduation on incarceration...	30
11	Probit Estimate the effects of high school graduation on incarceration.....	31
12	Marginal Effects the effects of high school graduation on incarceration...	33

CHAPTER ONE

INTRODUCTION

Crime is an insecure factor for a society. So crime reduction is one of the important policies that government needs to take into account. Crime reduction not only brings economic benefits but also bring social benefits. So here is the question: How to reduce crime? Some view of points focus on increasing police or improving crime-fighting technologies; others focus on the factors that may lead to the crime. Education is one of the most crucial factors that may reduce the crime. In 1997, over two-thirds of all prison inmates in the US were high school dropouts (Harlow 2003). Harlow (2003) also indicates that State prison inmates without a high school diploma and those with a GED were more likely to be repeat offenders than those with a diploma. Lochner and Moretti (2004) use the change in compulsory school leaving age laws to identify the effects of education on crime. They conclude that education is an alternative method to reduce crime instead of increasing the size of police forces.

In this paper, I follow Lochner (1999)'s method to estimate the impacts of education on crime participation by using self-reported data from NLSY97. Firstly, I analyze how the high school graduation impacts youth's crime participation from a theoretical perspective, which suggests that increasing in schooling could reduce most type of crimes. Then I use empirical method to estimate the effects of education on general crime participation. Besides the general crime participation, I follow Lochner's (2004) method classify crimes into violent crime, property crime and drug crime, which finds that high school graduation could reduce the probability of violent crime

participation by 3.38 percent, reduce the probability of property crime by 2.03 percent and 2.92 percent for property crime. Further, education level is also classified into three types: high school graduation, some college and college graduation. The results show that after controlling all the specifications, people with some college has the largest crime reduction effect on violent crime, people with college graduation degree exerts largest reduction effect on drug crime. The reduction effects of some college and college graduation are similar for property crime. Except for estimating the effects of education on crime participation, this paper also predict the effects of education on crime incarceration using subsequent analysis, which also find significant reduction effects.

The rest of the paper is organized as follows. Section 2 gives a brief literature review on the relationship between education and crime participation. Section 3 introduces the data source and the variables this paper will be included. Section 4 explains model and empirical method. Section 5 shows the results on how the high school graduation affects crime reduction from probit regression. Section 6 gives the conclusion and a few policy suggestions.

CHAPTER TWO

LITERATURE REVIEW

Some economic literatures indicate some evidences between high school graduation and criminal activities. Harlow (2003) finds that in year 1997, 75% of state and 59% federal prison inmates in the US did not hold a high school diploma; this number has increased over time. And this group of people is more likely to be the recidivists than those with a high school diploma. Raphael (2004) points out only 5 percent of black male will be incarcerated in 2000 if they have a high school diploma or attend some college and for white male, only 1 percent will be incarcerated. As for specific criminal behaviors, a ten percent increase in male graduation rate would decrease vehicle theft by 13 percent, murder and assault arrest rate by 20 percent based on Moretti (2005)'s study.

According to the evidences above, it could be raises a question: Is there contain a causal effect of education on crime? While, Lochner (2010) casts doubt on the standard regression studies on the causal effect of education on crime. He reasons that there contains unobserved individual characteristics like risk aversion and patience that may directly affect schooling and criminal decisions. Also, utilizing variation in education and crime across local communities or state may lead to biased estimates. Further, it may contain an opposite casual effect. People who engage in crime are more likely to drop out of school at a youth age. In order to solve these problems, several studies attempt to explore causal effect by using instrumental variable methods. An ideal instrumental variable is that it induces variation in schooling but is uncorrelated with other factors that

may directly affect criminal inclination. Lochner and Moretti (2004) use changes in state compulsory attendance laws as an instrumental variable for high school graduation; it is a valid instrument because changes in compulsory schooling laws are exogenous and not related to schooling. Lochner and Moretti use both ordinary least squares (OLS) and instrumental variables (IV) to estimate the quantitative impact of schooling on incarceration and arrest. They find that an additional year increase in state-level average education reduces state-level arrest rate by 11 percent by using OLS estimators. IV estimators indicate a slightly larger effect. Additional year of schooling reduce the probability of imprisonment by about 0.1% for white and 0.3%-0.5% for black. They also estimate the effects of education for different types of crime by using OLS estimate, they report additional year of average schooling reduce violent crime by almost 30 percent. Machin, Marie and Vujic (2010) use British data to estimate the effects of education on property crime from 1984 to 2002. They use the change of the minimum school leaving age as instrumental variable and find that additional year increase in average education attainment decreases property crime conviction rate by about 30 percent. Their estimates are more than twice greater than Lochner and Moretti (2004) 's estimates. Randi, Helena and Matthew (2011) utilized Sweden's compulsory schooling reform as an instrument variable for years of schooling to estimate the causal effects between education attainment and incarceration. He finds that additional year of schooling decreases the likelihood of male incarceration by 16 percent.

Besides the empirical results above, some theoretical reasons why education could affect crime participation are worth to be considered. Machin, Marie and Vujic

(2012) indicate three explanations regarding education's impact on crime. First are the income effects. Education could increase the returns to legitimate work and increase the opportunity cost of crime behaviors. Lochner (2004) utilizes human capital approach to estimate the effects of wages and opportunity costs on criminal behaviors. He concludes that more educated and intelligent people commit less crime due to the higher income and human capital. And also he estimates the impact of education on white-collar crime by using Uniform Crime Reports' data. The empirical results show that additional year of schooling could raise the white collar by 11 percent. Thus, there exists counter-evidence that education could increase criminal earnings. Secondly, Risk aversion and patience need to be considered, Oreopoulos (2007) concludes that people who drop out of school tend to more focus on immediate costs from schooling. Education could increase patience so that it could reduce the discount rate of future earnings. As a result, education could reduce the probability of committing a crime. Another explanation is the self-incapacitation effect, Tauchen et al. (1994) finds that time spent at school is negative with the probability of being arrest.

CHAPTER THREE

DATA

The data used in this paper is from the National Longitudinal Survey of Youth 1997 (NLSY97). NLSY97 contains approximately 9000 youths who were 12 to 16 years old as of December 31, 1996. Thus individuals in this sample are all born in year 1980 to year 1984. NLSY97 collects detailed information ranging from education attainment, annual earnings from work, family background to criminal behaviors. Individuals are interviewed annually started from year 1997. This data is suitable for studying the effects of education on crime for several reasons. Firstly, it consists a large sample group, which has substantial variation in response for criminal behavior questions. Secondly, NLSY97 is representative of the American youth born between 1980 to 1984. Thirdly, some fields of the survey that is potentially sensitive like criminal behavior or drug use were asked to use a self-administered portion of interview via a laptop computer rather than a face-to-face interview or a written survey. The better protection of personal privacy may lead to a more trustful and truthful responses. Although there still contains underreporting problem for criminal behaviors, the degree of such underreporting is much less than NLSY79, which is based on a written survey.

NLSY97 started annually survey from 1997 when the individuals aged from 12 to 16, this paper focuses on studying the effects of education on crime participation aged from 18 to 24. So I will select year 2003, which is round 7 because individuals are all aged 18 to 24 in this year, which is the age range I am interested in. As for criminal variables, I will choose year 2004, because criminal questions in 2004 survey are asked

whether individuals commit crime during the year 2003 to year 2004. The dependent variable is a binary variable and it equals to one if individuals commit at least one of the following crimes or do not respond to that question. Lochner (1999) regards individuals as criminal participants if they do not answer that question. According to Bjerck (2006)'s measurement method (Table 1), crime participation includes the following questions: Have you ever carried a gun since last interview? Have you ever purposely destroy property since last interview? Have you ever stolen anything less than \$50? Have you ever steal anything greater than \$50 including cars since last interview? Have you ever commit other property crimes since last interview? Have you ever attack anyone to hurt or fight since last interview? Have you ever sell or help sell illegal drugs since last interview? Have you ever sell marijuana? Have you ever sell or help sell illegal hard drugs since last interview? If individuals respond never commit any crimes above, it equals to zero.

In addition, I am not only interested in the effects of high school graduation on the general crime participation, I also interested in the effects of high school graduation on different kinds of crime. The effects of high school graduation may different for each type of crime. So I classify crimes above into three categories (Table 1): violent crime, property crime and drug crime. Each crime is a binary variable. Violent crime equals to one if individuals ever attack someone to hurt or fight since last interview. Property crime equals to one if individuals ever purposely destroy property since last interview, or if individuals ever steal anything less than \$50 since last interview, or if the individuals ever steal anything greater than \$50 including cars since last interview, or if individuals

ever commit other property crimes since last interview. Drug crimes equal to one if individuals sell or help sell illegal drugs since last interview, if individuals ever sell marijuana, or if individuals ever sell or help sell hard illegal drugs.

Table 1

Crime Category

	Crime Category	Questions in the survey
General Crime		1. Have you ever carried gun since last interview?
	Violent Crime	2. Have you ever attack anyone to hurt or fight since last interview?
	Property Crime	1. Have you ever purposely destroy property since last interview? 2. Have you ever steal anything greater than \$50 including cars since last interview? 3. Have you ever commit other property crimes since last interview? 4. Have you ever steal anything less than \$50?
	Drug Crime	1. Have you ever sell or help sell illegal drugs since last interview? 2. Have you ever sell marijuana? 3. Have you ever sell or help sell illegal hard drugs since last interview?

Note: Crime measurement method referenced from Bjerk (2006) and Lochner (2004). All the criminal variables are binary variables and equals to one if individuals ever commit that crime or do not answer that question, it equals to zero if individuals never commit that crime. Property crime equals to one if individuals ever answered one yes to the four questions related to property crime or do not answer this question. Drug Crime equals to one if individuals ever answered one yes to the three questions related to property crime or do not answer that question.

Table 2

Crime Participation Rate of 2004

Crime equals to 1	Frequency	Total	Percent
Total Crime	199	2846	6.99
Violent Crime	44	2846	1.55
Property Crime	148	2846	5.20
Drug Crime	46	2846	1.62

Note: All the dependent variables are binary variables. If individuals ever commit at least one crime or refuse to answer that question, it equals to one. Otherwise is zero.

Table 2 is a summary of crime participation rate in 2004. It shows that about 7 percent of individuals committed crime, and about 1.6 percent of individuals committed violent crime and drug crime, 5.2 percent of individuals committed property crime.

Variable summary statistics in Table 3 shows some detailed information for each variable. I classify education level into high school graduation and high school dropouts. High school graduation equals to one if the individuals' highest grade completed equals to or greater than 12. It equals to zero if less than 12 grade. Intact family refers to that individuals live with their parents at age 14. Teenage mother equals to one if individuals' mother given birth between 15 to 19 years old. SMSA equals to one if individuals live in a metropolitan city. Asvab test is a military enlistment test to reflect cognitive skill. Regional unemployment rate is obtained by calculating the weighted average. Besides predicting the effects of high school graduation on different crimes, I also interested in the effects of different degree of education attainment on three kinds of crime. So I sort education level into high school graduation, some college and college graduation. All of the three variables are binary variables. Incarceration equals to one if total number of incarceration equals to or greater than one, High school graduation equals to one if individuals' highest grade is 12 grade. Some college equals to one if individuals' highest grade between 13 grade to 15 grade. College graduation equals to one if individuals' highest grade is greater than 16 grade.

CHAPTER FOUR

METHOD AND MODEL

Lochner (1999) considers criminal participants if individuals report any income from criminal activities. However, this measurement method is problematic and may arise serious measurement error. Because NLSY97 is a self-reported survey, many individuals may either report zero or do not report any earnings from criminal activities. Also, the categories listed for the proportion of income from crime is broad, so it may difficult to obtain the true estimate results. This paper uses different measurement method to define criminal participation. If individuals ever commit at least one crime listed in Table 1 or refuse to answer that question, they will be considered as criminal participants and criminal participation variable equals to one. Otherwise, it equals to zero. Firstly, I will estimate the effects of high school graduation on general crime participation by using probit estimates. I would like to see whether or not high school graduation could reduce crime participation in some degree. Besides the general crime, the reduction effects of high school graduation may different for different types of crime. So I classify crime into violent crime, property crime and drug crime and use probit model to predict the impacts. Additionally, different degree of education levels may have different crime reduction effects for a certain type of crime. So I classify education level into high school graduate, some college and college graduate. I would like to estimate whether or not violent crime reduction effect is larger for college graduate individuals. Moreover, I am not only interested in crime participation but also interested in crime incarceration. I will use

subsequent analysis to estimate the effects of high school graduation on incarceration. Unlike Lochner (1999) 's paper use whether or not individuals were interviewed in jail between 1981 and 1985 to measure incarceration, this paper use the total number of incarcerations from round 1 to round 13 to estimate the subsequent effects of high school graduation on incarceration.

According to Locher's (2004) paper. The general model is generated by including factors that may affect crime participation or crime incarceration.

$$Pro(Crime_i = 1) = \alpha + \beta * HS_i + \gamma * X_i + \omega * M_i + \tau * Z_i + \rho * Q_i + \theta * Inter_i + \varepsilon_i$$

$Crime_i$ is a binary variable represents crime participation or crime incarceration of respondent i. HS_i is a dummy variable indicate whether the respondent is high school graduate or high school dropouts. X_i is a personal characteristic vector includes individuals' age, age Square, whether the respondent is Black or Hispanic. M_i is a family background vector consists of the highest grade completed by individuals' mother and father. Whether or not individuals live with parents at age 14. Whether or not individuals' mother give birth between 15 to 19 years old, family income. Z_i is a geographic vector indicates respondent's living region, whether he lives in the metropolitan area. Also, Z_i include regional unemployment rate and regional incarceration rate, which is calculated based on respondent's living region. Q_i is Asvab score, which represents personal cognitive skill, $Inter_i$ are the interaction terms Asvab* Black and Asvab*Hispanic. In this model, I include unemployment rate and incarceration rate these two macro variables

that may affect criminal behaviors. According to Lochner's paper (1999), they include local unemployment rate and state punishment rate of year 1980 by using NLSY79.

While in NLSY97, these macro variables are not the public data; Instead, I calculate the weighted average regional unemployment rate rather than use local unemployment rate.

Because regional unemployment rate and incarceration rate are both collinear with living region variables, so I will not include all of them when running regression.

CHAPTER FIVE

RESULTS

Table 4 reports the estimated coefficients of the effects on general crime participation using probit model. The effect of high school graduation on general crime participation is substantially and statistically significant. Column (1) - column (4) based on controlling different specifications. The first column does not control the cognitive skill (Asvab). Controlling for Asvab score, the coefficient on high school graduation drops a little. The coefficient of Asvab is negative which reflects the reduction effect of cognitive skill on crime participation, although it is not statistically significant. Controlling for the interaction terms between Asvab and race, I find that cognitive skill reduces criminal participation most for blacks, although the coefficient is statistically insignificant. Controlling for enrollment, there is a little change in the estimated coefficient for high school graduation. Column (5) includes regional unemployment and regional incarceration rate instead of living region; the coefficient on high school graduation is statistically significant and similar as column (1) - column (4). As a whole, high school graduation and cognitive skill could reduce crime participation for controlling any specifications. Following the probit estimates, Table 5 presents marginal effects of high school graduation on crime participation. All the coefficients of high school graduation are around -0.05, which indicates that high school graduation could reduce the probability of general crime participation for about 5 percent. The reduction effect of high school graduation is largest without controlling any other specifications.

The coefficient of Hispanic is negative, indicating Hispanic commit less crime than non-Hispanic. As for Black, the coefficient is positive after controlling skill, interaction terms and enrollment status. The coefficient of regional unemployment in Column (5) is 0.0075, which reflects that regional unemployment may increase the probability of crime participation by 0.75 percent.

After predicting the effects of high school graduation on general crime participation, I also interest in the effects of high school graduation on different types of crime participation. As classified in Table 1, there are violent crime, drug crime and property crime. Controlling for age, region of residence and enrollment status, the coefficient on high school graduation for each type of crime is negative and statistically significant for violent crime and property crime. The crime reduction effect on violent crime is the largest effect compare to drug crime and property crime. High school graduation could decrease the probability of committing violent crime by 4.42 percent. It could decrease the probability of committing property crime by 3.95 percent. Controlling for other family background variables and skill, the coefficient on high school graduation for each type of crime changed a little. As for both violent crime and property crime, the coefficients drop by about 0.01. While as for drug crime, the coefficient increases by about 0.005.

Then I further divide education level into high school graduate, some college and college graduate. This paper estimates the crime reduction effects on different education level. Table 7 presents the estimated coefficients from probit model using different specifications. Without controlling family background variables, the coefficients on

different education level for violent crime are all negative and statistically significant. If controlling for family background specifications, the negative effects for violent crime are still statistically significant across three education levels. The coefficients on some college and college graduate for drug crime and property crime are statistically significant after controlling specifications. Table 8 reports the marginal effects results. As for violent crime, the largest violent crime reduction effect is the individual with some college degree; people with some college degree could reduce the probability of committing violent crime by 2.98 percent without controlling for family background information. As for drug crime, individual with college graduate has the largest effect, which indicates that college graduate decrease the probability of committing drug crime by 1.49 percent. As for property crime, the largest crime reduction effect occurred in some college education level. Taking into account of family background variables, the effects are similar as those without controlling family background variables and have a slight different. The reduction effect for violent crime is a little larger than those without family background variables. As a whole, some college education level has the largest crime reduction effect for violent crime. College graduate has the largest crime reduction effect for drug crime. As for property crime, both some college and college graduate have the largest crime reduction effects, and these effects are much larger than those for high school graduation.

In order to check the robustness of results, this paper further estimates the effects on subsequent crime incarceration. The difference between crime participation and crime incarceration is that people participate crime may not be incarcerated. According to

Lochner's (1999) method, he measured incarceration if individual were interviewed in jail between year 1981 to 1985. Following Lochner's subsequent analysis, I use the total number of incarceration from round 1 to round 13 to measure incarceration. If the total number of incarceration equals to or greater than one, the dependent variable equals to one, otherwise is zero. Table 9 and Table 11 report the probit estimate results for male and female. In all the specifications, high school graduation significant reduces incarceration for both male and female. The reduction effects for male is larger than female in all specifications. Highest grade by individuals' father significant reduce incarceration in all specifications. It reduces the probability of incarceration by 5.4 percent if including all variables. Controlling for Asvab has little effect on schooling coefficient. The effect of Asvab on incarceration is negative significant for male although the magnitude is small. As for the effects of living region on crime incarceration, Female who lives in northeast will reduce the probability of crime incarceration by about 9.93 percent. Controlling for the interaction term, cognitive skill and race, black people could increase the probability of incarceration for male and decrease for female.

CHAPTER SIX

CONCLUSIONS

From a theoretical perspective, education could reduce crime participation since it increases the returns to legitimate work, raising the opportunity cost of crime participation and the cost of time for incarceration. Also, education may impact crime participation through its effect on risk aversion and patience. People with more patience have low discount rate of future so that they value future earnings. Education can increase patience, which leads to the low discount rate of future earnings. Thus, it may reduce the inclination on criminal behaviors. This paper use empirical method to estimate the effects of education on crime participation by using self-reported data from NLSY97.

As for the impacts on general crime participation, high school graduation significantly reduces general crime participation. In addition to the general crime participation, this paper also estimates the crime reduction effects on violent crime, property crime and drug crime. High school graduation reduces all three types of crime even when controlling individual cognitive skill and family background. High school graduation has the largest reduction effect on violent crime. Furthermore, I classify education attainments into high school graduation, some college and college graduate; the results show that some college has the largest crime reduction effects on violent crime. College graduate has the largest reduction effects on drug crime. Both some college and

college graduate have the substantially reduction effect on property crime. As for the effects on incarceration, the reduction effect for male is greater than female.

As a whole, education has a significant reduction effect on crime participation. From human capital- based model of crime and work, it has some policy implications for crime reduction in the long run. Policies like subsidizing schooling may have substantial effects on crime reduction. Hence, increasing offenders and potential offenders' education attainment, especially high school graduation can be one of the key methods to reduce crime.

APPENDICES

Appendix A

Table 3

Summary Statistics					
Variable	Observation	Mean	Sted.Dev	Min	Mac
High school graduate	2846	0.8862	0.3177	0	1
Age month	2846	256.169	17.1422	226	293
Age Square	2846	65916.31	8809.717	51076	85849
Black	2846	0.1521	0.3592	0	1
Hispanic	2846	0.1792	0.3836	0	1
Intact Family	2846	0.7273	0.4454	0	1
South	2846	0.3640	0.4812	0	1
Northeast	2846	0.1339	0.3406	0	1
North Central	2846	0.2600	0.4387	0	1
Teenage Mother Family	2846	0.0791	0.2699	0	1
Income(\$1000)	2846	69.706	83.0015	0.01	421.368
SMSA	2846	0.3640	0.3876	0	1
Asvab Score	2846	52.9890	28.7959	0	100
Asvab*Black	2846	5.4940	16.5626	0	99.655
Asvab*Hispanic	2846	7.1361	18.9593	0	98.086
Enroll in School	2846	0.9649	0.1842	0	1
Highest Grade Completed by Mother	2846	13.0464	2.9660	1	20
Highest Grade Completed by Father	2846	13.1627	3.2222	2	20
Regional Unemployment Rate	2846	7.1076	0.7059	6.4	8.2
Regional Incarceration Rate	2846	436.4834	85.9623	304	541
Incarceration High School graduation	2846	0.0436	0.2042	0	1
Some College	2846	0.3342	0.4718	0	1
College Graduation	2846	0.4575	0.4983	0	1
College Graduation	2846	0.0945	0.2926	0	1

Note: Data resource is from NLSY97 in 2003. Regional Unemployment Rate is calculated by weighted average unemployment rate in south, northeast north central.

Table 4

Probit Estimates of High School Graduation on General Crime Participation					
Variable	(1)	(2)	(3)	(4)	(5)
High School Graduate	-0.3535*** (0.1031)	-0.3251*** (0.1064)	-0.3218*** (0.1065)	-0.3354*** (0.1070)	-0.3096*** (0.1076)
Age	-0.0980 (0.0664)	-0.0969 (0.0664)	-0.0970 (0.0665)	-0.1015 (0.0665)	-0.1010 (0.0665)
Age Square	0.0002 (0.0001)	0.0002 (0.0001)	0.0002 (0.0002)	0.0002 (0.0001)	0.0002 (0.0001)
Black	-0.0348 (0.1082)	-0.0674 (0.1126)	0.0717 (0.1834)	0.0724 (0.1835)	0.0502 (0.1829)
Hispanic	-0.1495 (0.1130)	-0.1609 (0.1168)	-0.2788 (0.1981)	-0.2920 (0.1990)	-0.2321 (0.1960)
Highest Grade by Mother	0.0064 (0.0164)	0.0094 (0.1392)	0.0089 (0.0168)	0.0087 (0.0168)	0.0106 (0.0168)
Highest Grade by father	-0.0255* (0.0148)	-0.0225 (0.0151)	-0.0242 (0.0152)	-0.0245 (0.0152)	-0.0240 (0.0153)
Intact Family	0.0277 (0.0833)	0.0311 (0.0834)	0.0304 (0.0837)	0.0285 (0.0837)	0.0266 (0.0841)
Teenage Mother	-0.1276 (0.1395)	-0.1304 (0.1392)	-0.1393 (0.1399)	-0.1463 (0.1402)	-0.1420 (0.1404)
Family Income	0.0001 (0.0005)	0.0001 (0.0005)	0.0001 (0.0005)	0.0001 (0.0005)	0.0001 (0.0005)
South	-0.1163 (0.0979)	-0.1140 (0.0980)	-0.1195 (0.0983)	-0.1173 (0.0984)	—
Northeast	-0.2431* (0.1323)	-0.2330* (0.1326)	-0.2352* (0.1327)	-0.2424* (0.1330)	—
North Central	-0.0882 (0.1050)	-0.0825 (0.1052)	-0.0808 (0.1052)	-0.0796 (0.1054)	—

SMSA	-0.0975 (0.0928)	-0.0932 (0.0928)	-0.0918 (0.0930)	-0.0880 (0.0932)	-0.0786 (0.0939)
Asvab	---	-0.0016 (0.0015)	-0.0015 (0.0018)	-0.0016 (0.0018)	-0.0019 (0.0018)
Asvab*Black	---	---	-0.0043 (0.0042)	-0.0044 (0.0042)	-0.0043 (0.0042)
Asvab*Hispanic	---	---	0.0030 (0.0037)	0.0031 (0.0037)	0.0031 (0.0037)
Enroll in School	---	---	---	0.3847 (0.2362)	0.3807 (0.2370)
Regional Unemployment Rate	---	---	---	---	0.0578 (0.0751)
Regional Incarceration Rate	---	---	---	---	0.0005 (0.0006)
Intercept	11.9008 (8.5066)	11.7269 (8.5080)	11.7573 (8.5151)	0.3847 (0.2362)	11.1273 (8.5268)
Observations	2846	2846	2846	2846	2830

Note: All estimate use individuals ages 18-24 in the 2003 NLSY97. Dependent variable crime participation is a dummy variable. Column (2) control for cognitive skill (Asvab), Column (3) control for interaction terms of Asvab and race, Column (4) include all the controlling variables. Column (5) includes regional unemployment rate and regional incarceration rather than the living region.

Standard errors in parentheses

P<0.05, ** P<0.01, *** P<0.001

Table 5

Marginal Effects of High School Graduation on General Crime Participation

Variable	(1)	(2)	(3)	(4)	(5)
High School Graduate	-0.0560*** (0.0194)	-0.0506*** (0.0195)	-0.0499** (0.0194)	-0.0521*** (0.0196)	-0.0477** (0.0194)
Age	-0.0128 (0.0086)	-0.0126 (0.0086)	-0.0125 (0.0086)	-0.0130 (0.0085)	-0.0131 (0.0086)
Age Square	0.00002 (0.00002)	0.00002 (0.00002)	0.00002 (0.00002)	0.00003 (0.00002)	0.00002 (0.00002)
Black	-0.0044 (0.0135)	-0.0084 (0.0136)	0.0096 (0.0255)	0.0097 (0.0254)	0.0067 (0.0249)
Hispanic	-0.0181 (0.0127)	-0.0193 (0.0126)	-0.0315 (0.0194)	-0.0326* (0.0191)	-0.0268 (0.0201)
Highest Grade by Mother	0.0008 (0.0021)	0.0012 (0.0022)	0.0011 (0.0022)	0.0011 (0.0022)	0.0014 (0.0022)
Highest Grade by Father	-0.0033* (0.0019)	-0.0029 (0.0020)	-0.0031 (0.0020)	-0.0031 (0.0020)	-0.0031 (0.0020)
Intact Family	0.0036 (0.0106)	0.0040 (0.0106)	0.0039 (0.0106)	0.0036 (0.0105)	0.0034 (0.0107)
Teenage Mother	-0.0153 (0.0153)	-0.0156 (0.0152)	-0.0165 (0.0150)	-0.0171 (0.0149)	-0.0168 (0.0151)
Family Income	0.00001 (0.00006)	0.00002 (0.00006)	0.00001 (0.00006)	0.00001 (0.00006)	0.00001 (0.00006)
South	-0.0148 (0.0121)	-0.0144 (0.0121)	-0.0151 (0.0121)	-0.0147 (0.0120)	---
Northeast	-0.0276** (0.0130)	-0.0266** (0.0132)	-0.0267** (0.0131)	-0.0272** (0.0129)	---
North Central	-0.0111 (0.0128)	-0.0104 (0.0128)	-0.0101 (0.0128)	-0.0099 (0.0128)	---

SMSA	-0.0133 (0.0132)	-0.0126 (0.0131)	-0.0124 (0.0131)	-0.0118 (0.0130)	-0.0105 (0.0131)
Asvab			-0.0002 (0.0002)	-0.0002 (0.0002)	-0.0002 (0.0005)
Asvab*Black			-0.0006 (0.0005)	-0.0006 (0.0005)	-0.0006 (0.0005)
Asvab*Hispanic			0.0004 (0.0005)	0.0004 (0.0005)	0.0004 (0.0005)
Enroll in School				0.0376** (0.0167)	0.0375** (0.0170)
Regional Unemployment Rate					0.0075 (0.0097)
Regional Incarceration Rate					0.00006 (0.00008)

Note: All estimate use individuals ages 18-24 in the 2003 NLSY97. Dependent variable crime participation is a dummy variable. Column (2) control for cognitive skill (Asvab), Column (3) control for interaction terms of Asvab and race, Column (4) include all the controlling variables. Column (5) includes regional unemployment rate and regional incarceration rather than the living region.

Standard errors in parentheses

P<0.05, ** P<0.01, *** P<0.001

Table 6

Estimates the effects of high school graduation on violent crime, drug crime an property crime

Self-Reported Crime	Probit	Marginal Effects	Probit	Marginal Effects
Violent Crime	-0.7520*** (0.1723)	-0.0442*** (0.0163)	-0.6686*** (0.1899)	-0.0338** (0.0156)
Drug Crime	-0.2891 (0.1853)	-0.0159 (0.0126)	--0.3650* (0.2048)	-0.0203 (0.0148)
Property Crime	-0.3061** (0.1336)	-0.0395* (0.0204)	-0.2435* (0.1439)	-0.0292 (0.0199)
Age	Y	Y	Y	Y
South	Y	Y	Y	Y
Northeast	Y	Y	Y	Y
North Central	Y	Y	Y	Y
Enroll	Y	Y	Y	Y
Highest Grade By Mother	---	---	Y	Y
Highest Grade By Father	---	---	Y	Y
Intact Family	---	---	Y	Y
Teenage Mother	---	---	Y	Y
Family Income	---	---	Y	Y
Asvab Status	---	---	Y	Y

Standard errors in parentheses

P<0.05, ** P<0.01, *** P<0.001

Table 7

Probit estimates of the effects of different education level on three types of crime						
Self-Reported Crime	High School Graduate	Some College	College Graduate	High School Graduate	Some College	College Graduate
Violent Crime	-0.5189** (0.1517)	-0.9834*** (0.1774)	-0.9962*** (0.3674)	-0.5682*** (0.1594)	-1.0724** (0.2029)	-1.1339** (0.4033)
Drug Crime	-0.0895 (0.1773)	-0.2774 (0.1782)	-0.7324* (0.3828)	-0.1754 (0.1852)	-0.4571** (0.2023)	-0.9968* (0.4136)
Property Crime	-0.1522 (0.1184)	-0.4237*** (0.1195)	-0.6202*** (0.1966)	-0.1579 (0.1219)	-0.4027** (0.1338)	-0.5815** (0.2174)
Age	Y	Y	Y	Y	Y	Y
South	Y	Y	Y	Y	Y	Y
Northeast	Y	Y	Y	Y	Y	Y
North	Y	Y	Y	Y	Y	Y
Central						
Enroll	Y	Y	Y	Y	Y	Y
Highest Grade By	---	---	---	Y	Y	Y
Mother						
Highest Grade By	---	---	---	Y	Y	Y
Father						
Intact	---	---	---	Y	Y	Y
Family						
Teenage	---	---	---	Y	Y	Y
Mother						
Family	---	---	---	Y	Y	Y
Income						
Asvab	---	---	---	Y	Y	Y
SMSA	---	---	---	Y	Y	Y

Note: Self-reported crimes are based on individual's age between 18-24 in 2003. Violent crime corresponds to attack or hurt someone. Property crime includes purposely destroy,

steal other's belongs greater than \$50 including cars, steal less than \$50 and commit other property crimes. Drug Crime includes sell marijuana, illegal drugs and hard drugs. Each row represents a separate probit estimate. The dependent variables are dummy variables equals to one if respondent ever participated in that type of crime.

Standard errors in parentheses

P<0.05, ** P<0.01, *** P<0.001

Table 8

Marginal Effects estimates of the effects of different education level on three types of crime

Self-Reported Crime	High School Graduate	Some College	College Graduate	High School Graduate	Some College	College Graduate
Violent Crime	- 0.0125*** (0.0037)	- 0.0298*** (0.0061)	- 0.0128*** (0.0027)	- 0.0134*** (0.0039)	- 0.0327*** (0.0073)	- 0.0132*** (0.0028)
Drug Crime	-0.032 (0.0061)	-0.0100 (0.0064)	- 0.0149*** (0.0038)	-0.0057 (0.0056)	-0.0155** (0.0069)	- 0.0160*** (0.0031)
Property Crime	-0.0147 (0.0110)	- 0.0418*** (0.0116)	- 0.0413*** (0.0081)	-0.0149 (0.0110)	- 0.0389*** (0.0092)	- 0.0388*** (0.0092)
Age	Y	Y	Y	Y	Y	Y
South	Y	Y	Y	Y	Y	Y
Northeast	Y	Y	Y	Y	Y	Y
North	Y	Y	Y	Y	Y	Y
Central						
Enroll	Y	Y	Y	Y	Y	Y
Highest Grade By Mother	---	---	---	Y	Y	Y
Highest Grade By Father	---	---	---	Y	Y	Y
Intact Family	---	---	---	Y	Y	Y
Teenage Mother	---	---	---	Y	Y	Y
Family Income	---	---	---	Y	Y	Y
Asvab	---	---	---	Y	Y	Y
SMSA	---	---	---	Y	Y	Y

Note: Self-reported crimes are based on individual's age between 18-24 in 2003. Violent crime corresponds to attack or hurt someone. Property crime includes purposely destroy, steal other's belongs greater than \$50 including cars, steal less than \$50 and commit other property crimes. Drug Crime includes sell marijuana, illegal drugs and hard drugs. Each row represents a separate probit estimate. The dependent variables are dummy variables equals to one if respondent ever participated in that type of crime.

Standard errors in parentheses, P<0.05, ** P<0.01, *** P<0.001

Table 9

Probit Estimate the effects of high school graduation on incarceration

Variables	(1)		(2)	
	Male	Female	Male	Female
High School Graduate	-0.9276*** (0.1263)	-0.8158*** (0.2380)	-0.8285*** (0.1312)	-0.8311*** (0.2513)
Age	-0.0388 (0.1009)	-0.2459 (0.1708)	-0.0347 (0.1013)	-0.2461 (0.1709)
Age Square	0.00009 (0.0002)	0.0005 (0.0003)	0.00008 (0.0002)	0.0005 (0.0003)
Black	0.1076 (0.1626)	-0.6603 (0.4093)	-0.0268 (0.1717)	-0.6484 (0.4142)
Hispanic	0.0083 (0.1661)	-0.4415 (0.2990)	-0.0352 (0.1674)	-0.4383 (0.2998)
Highest Grade by Mother	0.0069 (0.0239)	0.0101 (0.0427)	0.0171 (0.0245)	0.0087 (0.0433)
Highest Grade by father	-0.0616*** (0.0226)	-0.0235 (0.0378)	-0.0503** (0.0232)	-0.0248 (0.0384)
Intact Family	-0.0107 (0.1197)	-0.1018 (0.2083)	-0.0012 (0.1203)	-0.1043 (0.2087)
Teenage Mother	-0.0496 (0.1917)	0.2234 (0.2788)	-0.0523 (0.1905)	0.2281 (0.2798)
Family Income	-0.0005 (0.0008)	0.0006 (0.0011)	-0.0005 (0.0008)	0.0006 (0.0011)
South	-0.1391 (0.1618)	-0.4288* (0.2325)	-0.1345 (0.1626)	-0.4314 (0.2328)
Northeast	0.2104 (0.1888)	-0.9128* (0.4671)*	0.2347 (0.1910)	-0.9222* (0.4718)
North Central	0.3137* (0.1612)	-0.4789 (0.2609)	0.3300** (0.1625)	-0.4825* (0.2616)
SMSA	0.1010 (0.1456)	-0.0678 (0.2372)	0.1207 (0.1468)	-0.0678 (0.2374)
Asvab	—	—	-0.0060** (0.0024)	0.0008 (0.0042)
Intercept	3.9183 (12.9691)	30.1939 (21.9504)	3.3223 (13.0138)	30.2334 (21.9610)
Obs	1450	1396	1450	1396

Note: All estimates use individual ages 18-24 the 2003 NLSY97. Individuals are considered incarcerated if they reported the total number of incarcerated is greater than one. All other measures taken from 2003 survey.

Standard errors in parentheses

P<0.05, ** P<0.01, *** P<0.001

Table 10

Marginal Effects the effects of high school graduation on incarceration

Variables	(1)		(2)	
	Male	Female	Male	Female
High School Graduate	-0.1641*** (0.0314)	-0.0427** (0.0212)	-0.1364*** (0.0305)	-0.0441* (0.0228)
Age	-0.0041 (0.0107)	-0.0056 (0.0039)	-0.0036 (0.0104)	-0.0056 (0.0039)
Age Square	9.31e-06 (0.00002)	0.00001 (0.00001)	8.23e-06 (0.00002)	0.00001 (0.00001)
Black	0.0122 (0.0195)	-0.0097** (0.0039)	-0.0027 (0.0171)	-0.0095** (0.0040)
Hispanic	0.0009 (0.0178)	-0.0074* (0.0039)	-0.0036 (0.0166)	-0.0073* (0.0039)
Highest Grade by Mother	0.0007 (0.0025)	0.0002 (0.0009)	0.0018 (0.0025)	0.0002 (0.0010)
Highest Grade by father	-0.0065*** (0.0024)	-0.0025 (0.0054)	-0.0052** (0.0024)	-0.0006 (0.0009)
Intact Family	-0.0011 (0.0128)	-0.0025 (0.0054)	-0.0001 (0.0124)	-0.0025 (0.0054)
Teenage Mother	-0.0051 (0.0189)	0.0064 (0.0098)	-0.0052 (0.0182)	0.0065 (0.0099)
Family Income	-0.0001 (0.0001)	0.00001 (0.00003)	-0.0001 (0.0001)	0.00001 (0.00003)
South	-0.0142 (0.0160)	-0.0090* (0.0048)	-0.0134 (0.0156)	-0.0090* (0.0048)
Northeast	0.0252 (0.0253)	-0.0106*** (0.0035)	0.0277 (0.0255)	-0.0106*** (0.0035)
North Central	0.0377 (0.0217)	-0.0086** (0.0042)	0.0387* (0.0215)	-0.0087** (0.0042)
SMSA	0.0102* (0.0139)	-0.0016 (0.0060)	0.0116 (0.0133)	-0.0016 (0.060)
Asvab	—	—	-0.0006*** (0.0002)	0.00002 (0.00009)

Note: All estimates use individual ages 18-24 the 2003 NLSY97. Individuals are considered incarcerated if they reported the total number of incarcerated is greater than one. All other measures taken from 2003 survey.

Standard errors in parentheses

P<0.05, ** P<0.01, *** P<0.001

Table 11

Probit Estimate the effects of high school graduation on incarceration

Variables	(3)		(4)	
	Male	Female	Male	Female
High School Graduate	-0.8134*** (0.1320)	-0.8247*** (0.2527)	-0.8166 (0.1328)	-0.8851*** (0.2610)
Age	-0.0356 (0.1015)	-0.2483 (0.1715)	-0.0364 (0.1016)	-0.2784 (0.1741)
Age Square	0.0008 (0.0002)	0.0005 (0.0003)	0.0001 (0.0002)	0.0006 (0.0003)
Black	0.1803 (0.2561)	-0.2538 (0.6863)	0.1801 (0.2562)	-0.2569 (0.6990)
Hispanic	-0.0788 (0.2602)	-0.7974* (0.5308)	-0.0815 (0.2606)	-0.8860 (0.5429)
Highest Grade by Mother	0.0181 (0.0245)	0.0055 (0.0442)	0.0179 (0.0245)	0.0049 (0.0447)
Highest Grade by father	-0.0529** (0.0234)	-0.0266 (0.0391)	-0.0529 (0.0234)	-0.0269 (0.0391)
Intact Family	-0.0001 (0.1210)	-0.0970 (0.2110)	0.0001 (0.1209)	-0.0971 (0.2128)
Teenage Mother	-0.0551 (0.1904)	0.2437 (0.2819)	-0.0547 (0.1904)	0.2130 (0.2861)
Family Income	-0.0005 (0.0008)	0.0006 (0.0011)	-0.0005 (0.0008)	0.0007 (0.0011)
South	-0.1448 (0.1631)	-0.4485* (0.2362)	-0.1439 (0.1632)	-0.4631* (0.2393)
Northeast	0.2371 (0.1908)	-0.9339** (0.4753)	0.2359 (0.1909)	-0.9701** (0.4826)
North Central	0.3317** (0.1625)	-0.4822* (0.2623)	0.3331 (0.1626)	-0.4811* (0.2639)
SMSA	0.1256 (0.1475)	-0.0681 (0.2388)	0.1257 (0.1479)	-0.0830 (0.2412)
Asvab	-0.0056** (0.0026)	0.0002 (0.0045)	-0.0056 (0.0026)	-0.00001 (0.0046)
Asvab*Black	-0.0090 (0.0083)	-0.0185 (0.0312)	-0.0091 (0.0083)	-0.0190 (0.0321)
Asvab*Hispanic	0.0016 (0.0055)	0.0084 (0.0094)	0.0016 (0.0055)	0.0103 (0.0096)
Enroll in School	—	—	0.0557 (0.2650)	

Intercept	3.4428 (13.0386)	30.6001 (22.0465)	3.4854 (13.0382)	34.4240 (22.3668)
Obs	1450	1396	1450	1347

Note: All estimates use individual ages 18-24 the 2003 NLSY97. Individuals are considered incarcerated if they reported the total number of incarcerated is greater than one. All other measures taken from 2003 survey.

Standard errors in parentheses

P<0.05, ** P<0.01, *** P<0.001

Table 12

Marginal Effects the effects of high school graduation on incarceration

Variables	(3)		(4)	
	Male	Female	Male	Female
High School Graduate	-0.1316*** (0.0303)	-0.0387* (0.0229)	-0.1322*** (0.0305)	-0.0440*** (0.0256)
Age	-0.0036 (0.0103)	-0.0049 (0.0037)	-0.0037 (0.0103)	-0.0054 (0.0038)
Age Square	8.28e-06 (0.00002)	9.67e-06 (0.00001)	8.44e-06 (0.00002)	0.00001 (0.00001)
Black	0.0204 (0.0321)	-0.0041 (0.0099)	0.0204 (0.0320)	-0.0041 (0.0100)
Hispanic	-0.0077 (0.0243)	-0.0095 (0.0055)	-0.0079 (0.0243)	-0.0100 (0.0057)
Highest Grade by Mother	0.0018 (0.0025)	0.0001 (0.0009)	0.0018 (0.0025)	0.0001 (0.0009)
Highest Grade by father	-0.0054** (0.0024)	-0.0005 (0.0008)	-0.0054** (0.0024)	-0.0005 (0.0008)
Intact Family	-0.00001 (0.0123)	-0.0020 (0.0047)	0.00001 (0.0123)	-0.0020 (0.0047)
Teenage Mother	-0.0054 (0.0179)	0.0062 (0.0091)	-0.0053 (0.0179)	0.0052 (0.0086)
Family Income	-0.0001 (0.0001)	0.00001 (0.00002)	-0.0001 (0.0001)	0.00001 (0.00002)
South	-0.0142 (0.0154)	-0.0081* (0.0049)	-0.0141 (0.0154)	-0.0083* (0.0050)
Northeast	0.0277 (0.0253)	-0.0092** (0.0042)	0.0275 (0.0252)	-0.0093** (0.0044)
North Central	0.0385* (0.0213)	-0.0075 (0.0043)	0.0387* (0.0213)	-0.0074 (0.0044)
SMSA	0.0118 (0.0131)	-0.0014 (0.0053)	0.0119 (0.0131)	-0.0017 (0.0054)
Asvab	-0.0006** (0.0003)	3.92e-06 (0.0001)	-0.0006** (0.0003)	3.26e-07 (0.0001)
Asvab*Black	-0.0009 (0.0008)	-0.0004 (0.0005)	-0.0009 (0.0008)	-0.0004 (0.0005)
Asvab*Hispanic	0.0002 (0.0006)	0.0002 (0.0005)	0.0002 (0.0006)	0.0002 (0.0002)
Enroll in School	—	—	0.0054 (0.0246)	

Note: All estimates use individual ages 18-24 the 2003 NLSY97. Individuals are considered incarcerated if they reported the total number of incarcerated is greater than one. All other measures taken from 2003 survey.

Standard errors in parentheses
P<0.05, ** P<0.01, *** P<0.001

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