

The Intergenerational Effects of Education on Delinquency

Aaron Chalfin¹

University of Pennsylvania

Monica Deza

University of Texas at Dallas

Abstract

Children of parents with low education are more likely to engage in delinquent behavior. One explanation for this is that parents that are more likely to obtain education are also inherently more likely to raise children in ways that are less conducive to crime. Alternatively, additional parental education may change parents' behavior in ways that ultimately reduces their children's propensity to commit crime. Using data from the NLSY79 and variation induced by changes in compulsory schooling laws in the United States, we find that increasing compulsory schooling reduces delinquent behavior among their children. In particular, an additional year of combined parental education decreases the propensity to damage property by 6 percentage points, assault by 4 percentage points and shoplifting by 4.5 percentage points. Higher parental education also results in smaller family size, higher expected number of years of education, less TV time and higher measures of self control, thus revealing several mechanisms through which these intergenerational effects are transferred. This study highlights the effect that compulsory schooling laws can have on improving intergenerational outcomes in contexts that have not been previously documented. Previous cost-benefit analysis of compulsory schooling laws appreciably underestimate their full benefits.

Keywords: Intergenerational effects, education, crime, delinquency

¹ Corresponding author: monica.deza@utdallas.edu
800 West Campbell Rd GR31, Richardson TX 75080

Highlights:

- We study the intergenerational effects of education on crime
- Children of more educated parents are less likely to engage in crime
- An additional year of combined parental education decreases assault by 4, shoplifting by 4.5 and property damage by 5 percentage points.
- Children of parents with additional education have fewer siblings, expect to ultimately obtain more education watch less television and have more self control than children of parents with lower education.

JEL Code: I20

1. Introduction

The standard economic model of criminal behavior draws on a simple expected utility model introduced in a seminal contribution by the late Gary Becker. This model envisions crime as a gamble undertaken by a rational individual. According to this framework, the aggregate supply of offenses will depend on social investments in police and prisons as well as on labor market opportunities which increase the relative cost of time spent in illegal activities. Using Becker's work as a guide, a large empirical literature has developed to test the degree to which potential offenders are deterred. The papers in this literature fall into three general categories – those that consider the responsiveness of crime to the probability that an individual is apprehended (typically proxied by police), those that study the sensitivity of crime to changes in the severity of criminal sanctions and those that identify the responsiveness of crime to the opportunity cost of its commission. This research considers whether crime is responsive to human capital investments or, alternatively, local labor market conditions.

Critically, while the first two policy mechanisms – police and prisons – create large and enduring collateral costs for communities, the third policy mechanism, increasing human capital, is associated with positive spillovers. The problem, of course, is that human capital investments are costly – consequently, the magnitude of these spillovers is critical for making sound policy decisions. This paper considers the extent of those spillovers and argues that previous literature has underappreciated the extent to which investments in human capital play an enduring role in reducing crime. In particular, we study the intergenerational effect of parents' education on crimes committed by the next

generation, finding effects that are at least as large as those associated with police and prisons.

Quantifying the extent to which teenagers' criminal participation can be reduced by increasing their parents' education is crucial for estimating the social benefits of policies that increase educational attainment.² While the effects of education on long term outcomes such as earnings (Acemoglu and Angrist, 2000), crime (Lochner and Moretti, 2004; Machin, Olivier and Vujic, 2011), fertility (Black, Devereaux, Salvanes, 2004), subjective well being (Oreopoulos, 2007), and mortality (Lleras-Muney, 2005) among other outcomes for the generation directly affected by compulsory schooling laws have been well documented, comparatively little research identifies the intergenerational effects of education on their children's outcomes. This paper documents an important and previously underappreciated intergenerational dividend to education. The implication is that previously documented effects of education on crime are only a fraction of the total effect. Crucially, the fact that parental education affects children's criminal behavior indicates that education can play a role in creating a "virtuous cycle," whereby external benefits continue to accrue to communities for many years. Given that many urban poor are in the words of sociologist, Patrick Sharkey, "stuck in place," the external intergenerational benefits are likely to be highly concentrated among those who are in greatest need.

Previous literature on the intergenerational effects of parental education on their children's outcomes focuses primarily on the intergenerational transmission of human

² While economists have long been pessimistic about the cost-effectiveness of academic remediation among older children, recent research suggests that such programs can be both efficacious and cost-effective (Heller et al 2016).

capital and, possibly due to data limitations, most of these studies use data from outside the United States. For instance, Black, Devereaux, and Salvanes (2005) exploit changes in compulsory schooling laws in Norway during the 1960s and finds that increases in maternal education yield corresponding increases their son's educational attainment. Similarly, Chevalier (2003) exploits changes in the compulsory schooling requirements in Great Britain in 1957 and finds a large effect of mother's education on children's education attainment with no effect from the father's education. Using data from the United States, Oreopolus, Page and Stevens (2006) exploit variation in compulsory schooling laws across states and find that a one year increase in the education of either parent reduces the probability that a child will repeat a grade.

To the best of our knowledge, Meghir, Palme and Schnabel (2012) is the only study that evaluates the intergenerational effects of education on crime. In their working paper, Meghir and his coauthors find that children and grandchildren of individuals who were educated under the education reform in Sweden are disproportionately less likely to be convicted of a crime than the children and grandchildren of individuals of the same cohort who were not exposed to the reform.

This study contributes to the literature of the intergenerational effects of education in four ways. First, to the best of our knowledge, this is the first research that studies the intergenerational effects of education on crime in the United States. Second, our outcome of interest is self-reported delinquency, which includes delinquent acts that are more prevalent among adolescents than crimes observed from administrative data on arrests which represent only a fraction of crimes committed (Thornberry and Krohn 2000). Third, this study explores whether parental education affect potential behavioral and non-

cognitive outcomes among the children of parents who were affected by more strict compulsory schooling laws. Finally, this research considers the mechanisms through which education does and does not have an intergenerational effect on crime.

The key to disentangling the causal effect of parental education on their children's propensity to commit crime is to identify an exogenous source in variation that affects parental education without directly affecting their abilities or directly affecting potential determinants of their children's outcomes. Exploiting changes in compulsory schooling laws that occurred between 1914 and 1974 in the United States, which affected, in particular, the lower tail of the socioeconomic distribution, this research evaluates whether *children of parents* affected by the policy are less likely to engage in delinquent behavior than children of parents not affected by compulsory schooling laws.

The empirical results suggest that compulsory schooling laws decreased the propensity to damage property among their children by 1.8 percentage points (relative to the average share of respondents who report having damaged property of 18%), decreased the propensity to assault by 1.3 percentage points (relative to the average share of respondents who report having committed assault of 27%) and the probability to shoplift by 1.3 percentage points (relative to the average share of respondents who report having shoplifted of 17%). These effects are important in comparison to standard policy mechanisms used to control crime – crime elasticities are larger, for example, than elasticities of crime with respect to police or the prison population.

Empirically, children of parents with low education are more likely to engage in delinquent behavior. One explanation for this is that parental education causally

decreases their children's criminal participation. Alternatively, this pattern could simply reflect the fact that parents that are more likely to obtain more education are also inherently more likely to raise children in ways that are less conducive to crime. We address several potential mechanisms through which compulsory schooling laws may affect criminal behavior of their children such as higher human capital transmission, lower fertility which results in more resources per child, or through parental attitudes towards crime. We find that increasing parental education results in a cohort that has fewer siblings, one that expects to ultimately obtain higher levels of education, one that watches less television and one that feels more in control over their lives.³ On the other hand, we do not detect differences in parental investments in formal training as proxied by summer educational activities and job training. Interestingly we also do not find that children of more educated parents get more sleep, a mechanism which has been linked to a range of negative outcomes among poor youth in the psychology literature (Barnes, 2011).

This paper is organized as follows. The next section discusses the data, while Section 3 presents the empirical strategy and discusses the findings. Finally, section 4 summarizes and concludes.

2. Data

Identifying the causal effect of parental education on criminal activity among teenagers using an instrumental variables approach requires data on parents' education,

³ The NLSY79 collected a Rotter scale score (Rotter, 1966) which measures the extent to which individuals believe they have control over their lives (internal control) relative to the environmental circumstances such as chance or luck determining their outcomes (external control). In particular, a high score indicates that the individual places higher value on external controls and hence have less control over their life outcomes. <https://www.nlsinfo.org/content/cohorts/nlsy79/topical-guide/attitudes>

parents' state of birth, parents' year of birth, and self-reported delinquent activity. In order to match parents to the compulsory schooling laws they were subject to, I use the state and year of birth of parents, and assign the compulsory schooling laws that were in place in the parent state of birth when this parent was 14 years old. The National Longitudinal Survey of Youth 1979 (NLSY79) is a near ideal dataset for this study because it provides measures of self reported delinquent activities as well as information about their parents' education, year and state of birth for a cohort of parents that were subject to changes in compulsory schooling laws at the age of 14⁴.

Previous literature measures compulsory schooling laws with two variables: (i) compulsory attendance laws (CA) and (ii) child labor laws (CL). Compulsory attendance laws state an age at which the students were required to begin school and an age at which they could drop out of school, as well as a minimum number of years of education the child was required to obtain. The initial laws had 8 as the entry age and 14 as the exit age but these changed over time (Clay, Lingwall, Stephens, 2016). On the other hand, child labor laws exempted working children from full time school attendance after certain age and allowed them to drop out of school before the exit age determined by the compulsory attendance laws (CA) (Clay, Lingwall and Stephens, 2016).

⁴ I use the variable R00065.00 and R00079.00 for the highest grade completed (years of education) by respondent mother and father, respectively. The variables R23035.00 and R25057.00 report the mother's year of birth in survey year 1987 and 1988, respectively. The variables R23031.00 and R25053.00 report the father's year of birth in survey year 1987 and 1988, respectively. Finally, the restricted variables R00062.00 and R00074.00 indicate the state of birth of mother and father, respectively.

Acemoglu and Angrist (2000) define CA laws as “the minimum years required before leaving school, taking account of age requirements⁵ and CL laws as minimum years in school required before work was permitted⁶. I use the CA and CL levels corresponding to each state between the years 1914-1974 from Moretti and Lochner (2003)⁷. During this period, states exhibited variation in compulsory schooling laws and the level of mandated education did not always move upwards (Moretti and Lochner, 2003). After obtaining CA and CL for the mother and father separately, we use as our instrument the variable compulsory schooling laws CSL, which is the larger of schooling required before leaving school and is defined as $CSL = \max\{CA, CL\}$ for the parent with the most strict laws.

The NLSY79 collected longitudinal information for a nationally representative sample of 12,686 individuals between the ages of 14 and 22 in 1979. From this sample, I delete the 6466 individuals whose mother and father have missing state of birth, were born in island territories or Alaska or Hawaii, or we could not assign a valid compulsory attendance laws to both parents, either because the year of birth was missing or because the parent turned 14 in years outside the period for which we have changes in compulsory schooling laws. After these deletions, we have 6220 observations.

Individuals also report in the NLSY79 the number of times they engaged in delinquent acts in the year prior to the interview conducted in 1980, when they were

⁵ CA is the “larger of schooling required before dropping out and the difference between the minimum dropout age and the maximum enrollment age” (Acemoglu and Angrist, 2000) and is defined as follows $CA = \max\{\text{reqsch}; \text{drop-age} - \text{enroll-age}\}$

⁶ CL is “the larger of schooling required before receiving a work permit and the difference between the minimum work age and the maximum enrollment age” and is defined as follows $CL = \max\{\text{work_sch}; \text{work_age} - \text{enroll_age}\}$

⁷ That data was obtained from <http://eml.berkeley.edu/~moretti/data.html>

between the ages of 14 and 22. I use this variable to compute an indicator for whether individuals engaged in any of the following 14 delinquent acts and report the respective probabilities in Panel A of Table 1⁸: Property damage, assault/fight, shoplifting, stealing an item worth less than \$50, stealing an item worth more than \$50, using force to obtain things, threatening to hit/hit someone, attacking someone with the intent to injure or kill, selling marijuana or hashish, trying to “con” someone, auto theft, breaking or entering, selling stolen goods, and gambling. While there are limitations to study self-reported crime, there is value in studying these minor delinquent behaviors that could potentially turn into more serious crime, and rarely become an arrest⁹. Panel B reports the probability of having been ever stopped by a police officer, ever been charged, ever been convicted, ever been referred to court-related counseling, ever been on probation and ever been sentenced to any type of correctional facility. A benefit of measuring criminal activity using self-reported data instead of arrests is that many crimes, especially adolescent crimes, do not ultimately result in an arrest and hence criminal participation is more prevalent than implied by arrest data (Levitt and Lochner, 2001).

The descriptive statistics of the NLSY79 presented in Table 1 can be summarized as follows. First, Panel A indicates that among the five most common delinquent acts among the NLSY79 respondents are assault/fights (27%), shoplift (26%), threat to hit/hit someone¹⁰ (37%) and steal something worth less than \$50 (19%) and damage property

⁸ The main analysis of this paper focuses on crimes where at least 15% of the sample reported having committed.

⁹ Comparisons between crime self-reports and official arrest data are usually highly correlated (Farrington, 1973)

¹⁰ Because we cannot separately identify whether the individual threatened to hit or actually hit someone, we do not use this outcome as one of the delinquent behaviors of interest.

(18%). Second, only 17% of the relevant sample have been stopped by police at least once (Panel B). Third, the respondents' mothers have on average 11.3 years of education and fathers have 11.4 years of education. Finally, the parents of the NLSY respondents were 14 years old between years 1914 and 1964, which span part of the period in which compulsory schooling laws change.

3. Methods and Findings

The main goal of this study is to establish a relationship between delinquent behavior and parental education. If parental education was randomly assigned, estimating a simple OLS regression would suffice and would capture the causal effect of parental education on their children's delinquent behaviors. However, parental education is far from random and largely correlated with other outcomes that could potentially affect their children's propensity to commit crime which implies that estimating such regression using OLS would produce a biased estimate. These effects would be contaminated by omitted factors that are correlated to both parental education and their children's delinquent outcomes.

To overcome the endogeneity problems, we rely on the exogenous variation in compulsory schooling laws which affected parental education and are unrelated to unobservable factors that affected their children's propensity to commit crime and use an instrumental variables approach to address the endogeneity issue.

We define the instrument as $CSL = \text{Max } CACL = \text{Max}\{CA, CL\}$ for the parent with the most strict compulsory schooling laws because mandated years of schooling as defined by CA or CL are positively correlated. Because state of birth and year of birth are highly correlated between mother and father, and hence mandated years of education are highly correlated between mother and father, we define the instrument as the

highest one between mother and father. This was explained in more detail in the data section.

The instrument is nearly ideal since it induces exogenous variation in parental schooling but is uncorrelated with characteristics that affect their children's propensity to commit crime. For instance, the instrument would not be valid if compulsory schooling laws were associated with increases in public expenditures aimed at decreasing crime in the future generation. Even if the implementation of compulsory schooling laws was accompanied by increases in police expenditures, this changes in police expenditure at the time parents were 14 years old should be unrelated to delinquent behavior in the period where their kids are teenagers or young adults (Lochner and Moretti, 2004). Interestingly, Lochner and Moretti (2004) find evidence that compulsory attendance laws were accompanied by slight decreases in per capital police expenditures, which is consistent with tradeoffs associated with strict state budget constraints. Finally, there are no trends in schooling during the years preceding changes in compulsory schooling ages (Lochner and Moretti, 2004).

Before estimating an instrumental variables model, we present evidence that the number of years of education mandated by the compulsory schooling laws that parents experienced at age 14 strongly predicts their level of education. To quantitatively measure the first stage effects of compulsory schooling laws on parental education, we estimate the following OLS regression using two measures of parental education (i) Combined parental education, or the sum of the number of schooling years of both

parents¹¹ (ii) Number of schooling years of each parent separately. Following Oreopolus et al (2006), I include indicators of state of birth and year of birth of one parent¹². The outcome of interest is

$$(2) \quad \text{Parental_Education}_i \\ = \gamma_0 + \gamma_1 \text{CSL}_i + \gamma X_i + \gamma_s^{\text{parent}} + \gamma_t^{\text{parent}} + \gamma_{\text{south}}^{\text{parent}} + \epsilon_i$$

We control for the age of the respondent in the first wave, an indicator for whether the respondent is black or Hispanic and an indicator for whether the respondent is male. While ideally we would be able to include fixed effects for each parent's state and year of birth, these are highly correlated between parents so we only include the state and year of birth fixed effects for one parent (Oreopolus et al 2006). Finally, because southern states changed compulsory schooling laws sometimes downwards in response to Brown versus Board in order to avoid requiring white children to attend school with black children (Lawrence Kotin and William Aikman, 1980; Lochner and Moretti, 2004), we include an indicator for whether one of the parents is from the south¹³. We cluster the standard errors by state of mother's birth. The compulsory schooling laws $\text{CSL}_i^{\text{mother}}$ and $\text{CSL}_i^{\text{father}}$ are defined as the maximum between CA and CL separately for each parent while CSL_i is defined as the toughest CSL faced by parents or $\text{CSL}_i = \max \{ \text{CSL}_i^{\text{mother}}, \text{CSL}_i^{\text{father}} \}$.

¹¹ While 5% of the sample have missing years of schooling as the mother 10% have missing years of schooling as the father's education. Hence missing father information is rare, and does not imply that the father is present..

¹² To follow Oreopolus et al (2006), I estimated a first stage for where the dependent variable was father's education and a separate regression where the dependent variable was mother's education and the results were similar.

¹³ For instance South Carolina and Mississippi repealed the compulsory attendance statutes in 1958 in order to avoid requiring white children to attend racially missed schools (Lawrence Kotin and William Aikman, 1980; Lochner and Moretti, 2004).

Before estimating an instrumental variables approach, we establish the relationship between the compulsory schooling laws that the parents were exposed to at age 14 and their children's propensity to engage in delinquent acts without imposing a restriction on the effect being through parental education. We estimate the following reduced form equation for the four most prominent crimes among teenagers in this sample: (1) Damage property, (2) Assault/fight, (3) Shoplifting, and (4) Stealing an item of value less than \$50. Equation 2 presents a reduced form equation that allows us to capture the relationship between compulsory schooling laws that the parents faced and their children's delinquent outcomes without having to commit to a singular mechanism.

$$(2) Y_i = \beta_0 + \beta_1 CLS_i + \beta X_i + \gamma_s^{parent} + \gamma_t^{parent} + \gamma_{south}^{parent} + \epsilon_i$$

Finally, we estimate the effect of combined years of parental education on their children's propensity to engage in delinquent behavior. Estimating a regression where the dependent variable is delinquent behaviors and the independent variable is the years of combined parental education as in equation 3 would be contaminated by endogeneity.

$$(3) Y_i = \theta_0 + \theta_1 Parental_Education_i + \theta X_i + \gamma_s^{parent} + \gamma_t^{parent} + \gamma_{south}^{parent} + \epsilon_i$$

Because parental education is endogenous with respect to crime, we exploit variation in state compulsory schooling laws and finally estimate an instrumental variables specification with the ultimate goal to evaluate whether parental education affects their children's propensity to engage in delinquent behavior.

4. Results

4.1 First Stage

First, we present evidence that the compulsory schooling laws affect parental education by estimating equation 1 separately for each parent and present the estimated

effects in Table 2. In particular, an additional CA required year of schooling results in 0.2 additional average years of education for the father. While compulsory schooling laws increased years of education for fathers, the effect was larger among low educated fathers.

Compulsory schooling laws as measured by CL have a stronger effect on average years of father's completed education. In particular, an additional year of mandated CL results in an additional 0.21 years of schooling on average among fathers with at most 12 years of education and only an additional 0.15 years of schooling on average among fathers with more than 12 years of education. On the other hand, the effect of compulsory schooling laws on average number of years of education of the mother is not statistically significant at the conventional level and smaller in magnitude than the effect on the father. This is the case whether we focus on CA or CL laws.

In a nutshell, Table 2 indicates that compulsory schooling laws are a good predictor of parental education mostly for the father, since his years of education are positively correlated with both the number of years mandated by CA and CL that were in place when he was 14 years old. These results strongly evidence a positive and strong first stage where both parents are responsive to some extent but the father is more responsive.

Following Oreopolus et al (2006), for the remaining of the paper we use combined years of parental education as our preferred measure of parental education and the maximum CSL between parents as the preferred measure of compulsory schooling laws $CSL_i = \max \{CSL_i^{mother}, CSL_i^{father}\}$. The CSL present a similar pattern and only increases average number of education years for the father, in particular for low educated fathers.

Table 3 presents the effect of compulsory schooling laws on combined parental education and indicates that an additional year of mandated compulsory education laws for either parent increases combined number of years of parental education by 0.27, which is only statistically significant among parents with at most 12 years of education each.

4.2 Reduced Form Effects of Compulsory Schooling Laws on Delinquency

We estimate the effects of exogenous changes in compulsory schooling laws on delinquent outcomes as specified in equation 2. The dependent variable Y_i is an indicator of the four most prevalent delinquent behaviors in the sample: (1) Damage property, (2) Assault/fight, (3) Shoplifting, and (4) Stealing an item of value less than \$50.

Increasing mandated education for parents is associated with a decrease in the propensity that their children damage property, engage in assault or fights, and shoplift. In particular, an additional year of CSL results in a 0.02 percentage point decrease in property damage (average of 18%), a 0.013 percentage decrease in assault (average share of 27%), a 0.013 percentage point decrease in shoplifting (average share of 26%) and no effect on stealing¹⁴.

4.3. The Effects of Parental Education on Delinquent Behaviors, 2SLS

The previous section establishes the relationship between compulsory schooling laws without making any assumptions about the mechanisms through which compulsory schooling laws that were in place when the parents were 14 affect their children's delinquent behaviors. This section examines directly the effect of parental education on crime and uses compulsory schooling laws as the instrument as in equation 3.

¹⁴ We perform the Anderson (2008) multiple hypothesis test and the p-values remain statistically significant.

Table 6 indicates that an additional year of combined parental education decreases the probability that their children engage in damaging property by 5.8 percentage points (average share of 18%), assault or fighting by 4 percentage points (average share of 27%) and shoplifting by 4.5 percentage points (average share of 17%) with no effect on stealing¹⁵.

Parental education may alter several outcomes that affect the way their children are being raised such as the size of their family, their expected completed education, the way they use their leisure time and even some personality traits. We estimate an instrumental variables model as in equation 3 using several family and demographic measures as the outcome of interest. The results can be summarized as follows. First, an additional year of education results in 0.19 fewer siblings, particularly older siblings, which indicates that these respondents are more likely to be first child which is in line with parents delaying fertility in response to higher education. Because there is a tradeoff between quality and quantity of children (Becker, 1960), children from smaller families may be receiving more attention from parents which could potentially affect their propensity to engage in crime. Second, an additional year of parental education results in an additional 0.17 years of expected completed education among children. Because children who expect to obtain higher education face a higher cost of criminal records, the expectations of higher education may deter some teens from committing delinquent acts. Third, parental education does not affect the summer activities of children, but it decreases the amount of time they spend watching TV. In particular, an additional year of combined parental education results in a 1.5 hour decrease in the number of hours

¹⁵ Because we are testing several outcomes, we perform the Anderson (2008) test where these outcomes remain with statistically significant p-values.

watching television in the week prior to interview. Finally, we also explore whether parental education affects non-cognitive personality tests such as the Rotter (Rotter Locus of Control Scale) score. Table 7 indicates that increasing parental education decreases the Rotter score, indicating that individuals with higher parental education place higher value on internal control and hence feel more in control of their lives.

5 Conclusions

This paper contributes to the literature on the intergenerational effect of schooling laws on delinquent behavior. This paper shows that increases in parental education driven by changes in compulsory schooling laws decreases the probability of committing crime, in particular damaging property, committing assault and shoplifting. In particular, an additional year of mandated education for parents results in a 0.018 lower probability of damaging property (average share 18%), 0.013 lower probability of committing assault (average share 27%) and a 0.013 lower probability of shoplifting (average share 26%).

When using an instrumental variables approach and imposing a restriction that compulsory schooling laws only affects crime through parental education, we find that an additional year of combined parental education decreases the propensity to damage property by 0.05 percentage points, decreases the propensity to assault someone by 4 percentage points and the probability of shoplifting by 0.45 percentage points with no effect on stealing.

Finally, we also examine how several demographic, behavioral and non-cognitive outcomes respond to increased parental education. In particular, we find that respondents with higher parental education had fewer siblings, expected to obtain higher education,

spent less time watching television, and felt more in control of their lives as measured by the Rotter score.

Previous cost benefit analysis may underestimate the full effect of education since there are consequences on the second generation and this should be taken into consideration going forward.

References

Acemoglu, Daron and Joshua Angrist (2000) How Large and the Social Returns to Education? Evidence from Compulsory Schooling Laws” NBER Macroeconomics Annual

Anderson Michael (2008) Multiple Inference and Gender Differences in the Effects of Early Intervention: A Reevaluation of the Abecedarian, Perry Preschool, and Early Training Projects. Journal of the American Statistical Association 103(484): 1481-1495

Barnes, Christopher (2011) Lack of Sleep and Unethical Conduct. Organizational Behavior and Human Decision Processes 115(2): 169-180

Becker, Gary (1960) “An Economic analysis of Fertility” Demographic and Economic Change in Developed Countries. Princeton. Princeton University Press.

Black, Sandra, Paul Devereaux and Kjell Salvanes (2004) Fast Times at Ridgemont High? The Effect of Compulsory Schooling Laws on Teenage Births. NBER Working Paper 10911

Chevaliers, Arnaud (2003) Parental Education and Child’s Education: A Natural Experiment. Mimeo, University of College Dublin, 2003.

Kotin, Lawrence and William Aikman (1980) Legal Foundations of Compulsory School Attendance (Port Washington, NY; Kernikat Press)

Levitt, Steven and Lance Lochner (2001) The Determinants of Crime. Risky Behavior Among Youths: An Economic Analysis. Jonathan Gruber, editor. University of Chicago.

Lleras-Muney, Adriana (2004) The Relationship Between Education and Adult Mortality in the United States. *The Review of Economic Studies* 72(1): 189-221.

Lochner, Lance, and Enrico Moretti (2003) The Effect of Education on Crime: Evidence from Prison Inmates, Arrests, and Self-Reports. *American Economic Review* 94(1). Pp 155-189

Machin, Stephen, Olivier Marie and Suncica Vujic (2012) Youth Crime and Education Expansion. *German Economic Review* 13(4): 366-384.

Meghir, Costas, Marten Palme and Marieke Schnabel (2012) The Effect of Education Policy on Crime: An Intergenerational Perspective. NBER Working Paper Series, WP 18145

Oreopoulos, Phillip, Marianne E. Page and Ann Huff Stevens (2006) The Intergenerational Effects of Compulsory Schooling. *Journal of Labor Economics* 24(4), pp. 729-760

Oreopoulos, Phillip (2007) "Do Dropouts Drop Out Too Soon? Wealth, Health, and Happiness from Compulsory Schooling. *Journal of Public Economics* 91. Pp. 2213-2229

Thornberry, Terence and Marvin Krohn (2000) The self-report method for measuring delinquency and crime. Criminal justice 4

Table 1: Summary Statistics of Measures of Crime

	Mean	Min	Max
Panel A: Probability Ever Committed the Following Crimes			
Damage Property (Delin 4)	0.18	0	1
Assault/Fight (Delin 5)	0.27	0	1
Shoplift (Delin 6)	0.26	0	1
Steal Worth Less than \$50 (Delin 7)	0.19	0	1
Steal Worth More than \$50 (Delin 8)	0.05	0	1
Used Force to Obtain Things (Delin 9)	0.05	0	1
Threatened to Hit/Hit Someone (Delin 10)	0.38	0	1
Attack Someone with Intent to Injure/Kill (Delin 11)	0.11	0	1
Sell Marijuana/Hashish (Delin 14)	0.10	0	1
Sell Hard Drugs (Delin 15)	0.02	0	1
Tried to Con Someone (Delin 16)	0.23	0	1
Auto Theft (Delin 17)	0.08	0	1
Breaking and Entering (Delin 18)	0.06	0	1
Sold/Held Stolen Goods (Delin 19)	0.11	0	1
Gambling (Delin 20)	0.02	0	1
Panel B: Probability of Conviction Outcomes			
Ever Stopped by Police	0.17	0	1
Ever Charged	0.09	0	1
Ever Convicted	0.05	0	1
Court Counseling	0.05	0	1
Probation	0.05	0	1
Correction	0.02	0	1

(Continued) Table 1: Summary Statistics of Measures of Crime

	Mean	Min	Max
Panel C: Demographics			
Hispanic	0.09	0	1
Black	0.26	0	1
Male	0.46	0	1
Combined Parental Years of Education	22.87	0	40
Mother's Years of Education	11.33	0	20
Father's Years of Education	11.40	0	20
Mothers with At Most 12 Years of Education	0.81	0	1
Fathers with At Most 12 Years of Education	0.74	0	1
Panel D: Cohort of Parents' Birth			
Father Year of Birth	1930.52	1900	1950
Mother Year of Birth	1934.26	1907	1950
Father born in the South	0.44	0	1
Mother born in the South	0.46	0	1
Year Mother Turned 14	1948.26	1921	1964
Year Father Turned 14	1944.52	1914	1964
Age of Respondent 1979	17.67	14	22
N		6220	

Table 2: The Effect of Compulsory Schooling Laws on Parental Education

	Mother's Years of Education			Father's Years of Education		
	All	At most HS	More than HS	All	At most HS	More than HS
Compulsory Attendance (CA)	0.040 (0.056)	0.021 (0.036)	0.065 (0.043)	0.192* (0.072)	0.126 (0.071)	0.084 (0.051)
Child Labor Laws (CL)	0.110 (0.061)	0.130 (0.065)	-0.034 (0.082)	0.259** (0.084)	0.205* (0.077)	0.154** (0.050)
CSL=max{CA, CL}	0.039 (0.054)	0.023 (0.035)	0.049 (0.043)	0.188** (0.070)	0.122 (0.069)	0.081 (0.051)
Observations	5464	4411	1053	4555	3279	1276
Parent State of Birth FE				Y		
Parent Cohort of Birth FE				Y		
Parent Born South				Y		
Controls:Age, Race, Gender				Y		
Cluster Parent State of Birth				Y		

Note: The + indicates $P \leq 0.10$; * indicates $P \leq 0.05$; ** indicates $P \leq 0.01$; *** indicates $P \leq 0.001$

Table 3: The Effect of Compulsory Schooling Laws on Combined Parental Education

	<u>All</u>	<u>Both At Most HS</u>	<u>Both More than HS</u>
CSL=max{CA, CL}	0.274*** (0.074)	0.201* (0.085)	-0.027 (0.107)
Constant	5.770 (4.523)	7.054* (3.446)	26.632*** (2.014)
observations	4447	2922	666
Parent State of Birth FE		Y	
Parent Cohort of Birth FE		Y	
Parent Born South		Y	
Controls:Age, Race, Gender		Y	
Cluster Parent State of Birth		Y	

Note: The + indicates $P \leq 0.10$; * indicates $P \leq 0.05$; ** indicates $P \leq 0.01$; *** indicates $P \leq 0.001$

Table 4: The Effect of Compulsory Schooling Laws on Delinquent Outcomes

	<u>Damage Prop</u>	<u>Assault/Fight</u>	<u>Shoplift</u>	<u>Steal<\$50</u>
CSL=max{CA, CL}	-0.018*** (0.005)	-0.013* (0.005)	-0.013* (0.005)	-0.006 (0.004)
Constant	0.473*** (0.101)	0.490*** (0.113)	0.194 (0.101)	-0.002 (0.080)
N	4643	4662	4659	4661
Parent State of Birth FE			Y	
Parent Cohort of Birth FE			Y	
Parent Born South			Y	
Controls:Age, Race, Gender			Y	
Cluster Parent State of Birth			Y	

Note: The + indicates $P \leq 0.10$; * indicates $P \leq 0.05$; ** indicates $P \leq 0.01$; *** indicates $P \leq 0.001$

Table 5: Effect of Combined Compulsory Schooling Laws on Outcomes, 2SLS

	Damage Prop	Assault/Fight	Shoplift	Steal<\$50
Parental Education	-0.058*	-0.040*	-0.045*	-0.021
	(0.024)	(0.019)	(0.020)	(0.016)
Constant	0.807	0.706*	0.484*	0.148
	(0.430)	(0.316)	(0.239)	(0.194)
N	4229	4242	4243	4244
Parent State of Birth FE			Y	
Parent Cohort of Birth FE			Y	
Parent Born South			Y	
Controls: Age, Race, Gender			Y	
Cluster Parent State of Birth			Y	

Note: The + indicates $P \leq 0.10$; * indicates $P \leq 0.05$; ** indicates $P \leq 0.01$; *** indicates $P \leq 0.001$

Table 6: The Effect of Parental Education on Potential Mechanisms, 2SLS

	Number of siblings	Number of older siblings	Expected Years of Education	Summer vacation	Hours Sleep Last Week
Parental Education	-0.193* (0.091)	-0.186* (0.073)	0.172* (0.071)	0.010 (0.008)	-25.890 (37.092)
Constant	9.500*** (2.459)	8.648*** (2.089)	9.412*** (1.503)	-0.098 (0.158)	5787.356*** (1040.891)
Observations	4914	4741	4893	4914	4798
	Summer nothing	Summer Job Training	Hours TV Last Week	Rotter Score	Self Esteem Score
Parental Education	0.006 (0.011)	0.006 (0.008)	-1.440** (0.538)	-0.162* (0.065)	0.150 (0.173)
Constant	-0.057 (0.211)	-0.174 (0.160)	33.569** (10.273)	15.550*** (1.796)	12.198* (5.168)
Observations	4914	4914	4792	4872	4761
	Outgoing at Age 6	Outgoing as Adult	Hours Studying Outside School		
Parental Education	-0.003 (0.020)	-0.024 (0.018)	-0.098 (0.607)		
Constant	-0.080 (0.375)	1.403*** (0.350)	-6.187 (5.572)		
Observations	4788	4795	2198		
Parent State of Birth FE			Y		
Parent Cohort of Birth FE			Y		
Parent Born South			Y		
Controls: Age, Race, Gender			Y		
Cluster Parent State of Birth			Y		

Note: The + indicates $P \leq 0.10$; * indicates $P \leq 0.05$; ** indicates $P \leq 0.01$; *** indicates $P \leq 0.001$