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ABSTRACT

Crime and Education*

Research studying connections between crime and education is a prominent aspect of the big increase of publication and research interest in the economics of crime field. This work demonstrates a crime reducing impact of education, which can be interpreted as causal through leveraging research designs (e.g., based on education policy changes) that ensure the direction of causality flows from education to crime. A significant body of research also explores in detail, and in various directions, the means by which education has a crime reducing impact. This includes evidence on incapacitation versus productivity raising aspects of education, and on the quality of schooling at different stages of education, ranging from early age interventions, through primary and secondary schooling and policy changes that alter school dropout age. From this evidence base, there are education policies that have been effective crime prevention tools in many settings around the world.

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1. Introduction

Over the years, numerous social science research studies have explored a wide range of determinants of criminal behaviour. A focus has been placed on demography (e.g. age, gender, race), on acquired characteristics (e.g. education, immigrant status) and many economic and social characteristics (e.g. income, family, community factors) as potential drivers of criminality. In this review, we focus on one of these, education, a driver of crime that has been featured in social science research for a long time but has only more recently received a prime focus of attention in the economics of crime literature.

The potential for education, broadly defined, to impact crime has recently been studied intensively as the economics of crime field has grown rapidly. Table 1 shows this expansion of research endeavour, presenting bibliometric evidence on publications about the economics of crime, and more specifically on crime and education, in a set of 21 of the leading academic journals in economics across decades from the 1990s onwards. In each year of the 1990s, an average of 6 publications made it into these journals. In the 2000s, this rose to 19. It almost doubled that, reaching 37 per year in the 2010s. From 2020 to date, it exploded higher, nearly doubling again to 76 per year. This amounts to a very sizable share for the economics of crime field, which has gone from being a fledging research area 40 years ago, to a sizable and growing contemporary one.

The Table also shows the number of crime and education papers within this rapid growth, and their share. There were none in the 1990s, 5 percent in the next two decades (going from an average of one per year in the 2000s, to three per year in the 2010s) and over one in ten (or 8 per year) in the 2020s.[1] For one sub-area of crime economics research, this

[1] Another way of characterising the rapid rise over time is to consider the timings of references in this review. The review has a reference list comprising 103 items, with 4 from before 2000, 21 dated 2000-2009, 35 dated 2010-19 and 43 either dated 2020-24 or forthcoming.

is quite substantial. This is especially true if one considers the large number of topic areas within the economics of crime field that feature in the publications considered in the Table, and more broadly in a wider set of publication outlets. Many of the areas that feature can be seen in reviews about crime and economic incentives (Draca & Machin 2015), crime and deterrence effects of the criminal justice system (Chalfin & McCrary 2017) and on the economics of crime and the labour market (Hjalmarsson et al. forthcoming).

One of the rationales for studying the impact of education on crime in economics has a foundational genesis in Becker's (1968) cost benefit under uncertainty formulation of why individuals commit crime. In that approach (and the closely related one of Ehrlich 1973) individuals decide whether or not to engage in crime by assessing whether the expected benefits from crime (the economic benefits that accrue netting out the probability of being caught) outweigh the expected costs (normally in terms of an opportunity cost). The possible options by which the benefits and costs are assessed is usually in terms of the payoff from a risky crime choice (risky because you can get caught engaging in crime) as compared to a certainty equivalent payoff of earnings from a job in the labour market.

Education can come into this framework because of the (by now well established) existence of a positive labour market impact of education whereby individuals with higher levels of education and schooling get paid more and get better quality jobs than those with lower levels (see Card 1999). In the Becker/Ehrlich cost benefit calculation, a higher earnings payoff from more education will clearly tilt an individual at the margin in the direction of not committing crime.

Education can also impact crime through other routes. One is spending more time in school. This generates the so-called incapacitation effect, the implications of which will be discussed in more detail later, that arises from the notion that, whilst in the classroom,

individuals are not able to commit crimes. So, for example, if education policies raise the compulsory school leaving age to an older one then people who may have previously left school at the prior lower age are not able to do so. If they would have committed crimes, these would be deterred.

Individuals may also have different preferences for valuing the present and the future such that potential future criminals differ in their discount rates (with parallels to decisions about whether to invest in education or not as in Card 1999). More education therefore not only increases economic returns, but may also increase a youth's patience, and lead them to put more weight on their potential future earnings (as in Becker & Mulligan 1997).

Crime experiences too, either as a perpetrator or a victim, can impact subsequent education. We will discuss evidence studying whether exposure to the criminal justice system as a juvenile has an impact on education, as well as more recent work that studies whether exposure to crime, for example in neighbourhoods where people grow up or by being a victim of crime, also impacts education acquisition.

This reflects a fundamental empirical challenge that underlies the crime-education connection. Much of the recent work in crime economics addresses this head on. Specifically, it is clear that the direction of causation can flow in both ways: either from education to crime, or from crime to education. Arguments like those already discussed above can be leveraged to support both. We carefully discuss both of these in this review, with the aim of showing what the research credibly says about unravelling the direction of causation.

There are various different aspects of the research profile on crime and education that has developed through time, and some critically link to the conceptual ways in which education might be thought of as impacting crime. For instance, some of the earlier work

considers the relationship between adult crime and completed education and schooling. Other work considers not just the quantity of education, but also its quality, for example from attending different quality schools or being affected by education policies.

Some of the work considers criminality while in school. And for causality in the opposite direction, it is plausible that criminal experiences may impact subsequent educational achievement, a focus that has received significant attention in the current economics of crime research for both victims and perpetrators of crime. We will review what the research says about all of these different means by which crime and education can be causally related.

In this review, we have adopted an approach that allocates the empirical research on crime and education into four substantial tranches, plus two others that are a little less easy to group together owing to their more heterogeneous nature. For each we have produced a detailed Table that discusses the study context, data, research design, methodology and main findings. The Tables for the six respective areas are in Tables A.1 through A.6 of the online Appendix. These are provided for the reader who would like more detail on particular studies that we discuss below in the main text of the review. For the four main tranches, we include shortened versions of the longer Appendix Tables in the review.

The rest of the review proceeds as follows. It covers four broad areas of crime-education research we have grouped related studies into in sections 2 to 5. Section 2 considers the literature that exists on the crime-reducing impact of education and compulsory school attendance. Section 3 discusses the link between incapacitation, productivity and crime. In Section 4 the focus is on links between school quality and crime. Section 5 covers the work that considers the reverse causality when crime histories and experiences potentially impact subsequent education acquisition. Section 6 summarises the

findings from the other two areas that are more heterogeneous in nature. Section 7 concludes.

2. Crime, Completed Education and Dropout Age Laws

The causal crime and education literature that has emerged in the last two decades represents the first way economists have seriously and systematically assessed the extent to which education can impact crime. Prior to this, one can find instances whereby correlations between crime and education have been studied, on occasion by economists and more broadly in other social science disciplines. However, in this work the magnitude and direction of reported correlations remain very much open to interpretation because of the well-known difficulty in establishing an impact of education on crime due to the endogenous nature of individual educational trajectories and the range of feedback effects working through the simultaneous nature of the relationship where crime can affect education while at the same time education can affect crime.

The literature that directly assesses the causal nature of the crime-education relation, beginning with Lochner & Moretti (2004), has studied the empirical relationship between adult criminality and levels of completed schooling. In this work, the research question is typically structured to ask whether individuals with different levels of completed schooling are more or less likely to subsequently commit crime after completing their schooling careers. The possibility of biased estimates emerging from the endogenous nature of completed education as an independent variable in the crime equation is usually circumvented by comparing the crime and education trajectories of individuals who face different compulsory school age dropout laws.

To more clearly see the logic that establishes education impacting crime and not the other way around, consider the example scenario of when one US state changes its dropout age in a given year and a second state does not. Suppose before the change, the school dropout age is 16 in both states, but the first state moves its dropout age up by one year to age 17 whilst the second state keeps the dropout age at 16. In the first state, individuals leaving school would acquire an extra year of education when the dropout age is raised compared to others leaving school before the education reform, whilst in the second they can still leave school at age 16. A comparison of completed education and crime for those affected and not affected can then yield a causal impact of education on crime. As the education policy was not designed with crime reduction in mind, the raising of the school leaving age can be thought of as generating possible crime reductions from education as an unintended consequence, or indirect spillover on to crime, from the policy.

Formally then, there are two reduced form empirical equations that relate the two variables of interest – crime, C, and completed education, E – to the dropout age reform variable D, from which a structural form relationship between C and E can be derived. Continuing with the US states scenario, as in Lochner & Moretti (2004), the respective reduced forms in a bivariate regression setting for education and crime are[2]:

$$E = \alpha_1 + \beta_1 D + \varepsilon_1 \quad (1)$$

$$C = \alpha_2 + \beta_2 D + \varepsilon_2 \quad (2)$$

In equation (1) the reduced form impact of a higher dropout age on education is β_1, and in equation (2) on crime is β_2 (where ε_1 and ε_2 are error terms).

[2] Of course, in many empirical applications other control variables are included in such regression specifications, including various fixed effects in panel data type studies and observables that may be correlated with crime and/or education.

The structural form corresponding to the two reduced forms can be implemented to derive causal estimates as:

$$C = \alpha_3 + \beta_3 E + \varepsilon_3 \quad (3)$$

In (3), the causal impact of education on crime is the ratio of the reduced form impacts, $\beta_3 = \beta_2/\beta_1$. The estimate of β_3 is an instrumental variable estimate where the dropout age D is used an instrument to predict completed education from the first stage equation (1) which then elicits the causal impact of education on crime in equation (3).

A body of empirical evidence adopting this approach has documented the crime-reducing role of dropout age (DA) laws in the long run, particularly for males. Table 2 and Appendix Table A.1 list 13 studies in this area, ordered by year of publication. Both Tables list the same studies, but the Appendix Table contains additional details on the study setting, the data and the research design. The first is the seminal paper of Lochner & Moretti (2004) which uses state-level data from the US to show that greater exposure to compulsory education reduces lifetime incarceration. Lochner and Moretti relate prison, arrests and self-report crime data to education. They leverage state level shifts in the US compulsory school leaving age matched to 1960, 1970 and 1980 Census data, to Uniform Crime Reports arrests data, plus self-reported NLSY crime. Their Census analysis studies incarceration of males aged 20-60. The study shows a strong first stage, where being exposed to an increase in the school dropout age in the state where one was schooled significantly raises completed years of schooling. In their analysis of arrests, the reduced form shows a significant reduction in subsequent crime for treated birth cohorts, implying that an additional year of schooling reduces state level arrest rates by at least 11 percent, with similar effects for both violent and property crime. Causal crime reductions from more education emerge from the same

research design applied to each of their empirical analyses of Census imprisonment, arrests and self-reported NLSY data.

Machin et al. (2011) use aggregate cohort data to show that the 1972/73 school leaving age education reform that was enacted in England and Wales, raising the DA from 15 to 16, decreased the risk of lifetime incarceration as it caused a significant reduction in property crime and a non-significant reduction in violent crimes. Their analysis explicitly sets up and implements a regression discontinuity design comparing school leaving cohorts immediately adjacent to the policy change, a research approach that also characterises some of the more recent causal work (notably Bell et al.'s 2022 study of discontinuities from 30 US state DA reforms from 1980 to 2010).

Anderson (2014) uses US county-level data to document that exposure to higher DA laws reduces property and violent crime arrest rates for juveniles aged 16–18, compared to a control group of 13–15 year olds. Anderson's (2014) analysis of the Youth Risk Behaviour Survey data also suggests the potential for delinquency to move from the streets into schools, as stricter DA laws result in young women missing more school out of fear for their safety. Using US school-level survey data to address a similar question, Gilpin & Pennig (2015) show an increase in overall in-school crime in US States that raise their DA to 18, and no effect in States that raise it to 17 (relative to schools in states that do not). Bell et al. (2016) use data at the level of the commuting zone in the US together with Census data to document the negative link between schooling laws and crime, measured either by arrests or incarceration.

Meghir et al. (2012) and Hjalmarsson et al. (2015) were perhaps the first studies to use microdata to assess the crime-reducing impact of a DA reform. Availability of microdata enables scaling of the reduced form results by the effect of the DA reform on years of

schooling and thus derive results that are arguably free from general equilibrium effects that may bias previous estimates (Hjalmarsson et al. 2015). Both studies analyse a schooling reform implemented gradually in the 1950s and 1960s across Swedish municipalities and show that the increased years of schooling caused by the reform resulted in reduced convictions and criminal activity. Unlike Hjalmarsson et al. (2015), Cano-Urbina & Lochner (2019) find a reduction in female criminality as a result of the DA reforms in the US. Bell et al. (2022) explore the reasons why increased education generates a reduction in crime. They conclude that a key way in which education generates lasting crime reductions in the lives of individuals is by incapacitating young people at an age when the risk of committing crime is highest. By reducing the risk of crime during teenage years, DA laws have the potential to modify an individual's entire crime-age profile.

Recent studies have generated empirical evidence from other countries that corroborates the conclusion that completed education exerts a lasting crime-reducing effect. In particular, evidence of a lasting crime-reducing effect of DA laws and the increased completed years of education has appeared also in studies from Australia, Denmark and Italy. Beatton et al. (2017) show that Queensland's 2006 "Earning or Learning" reform led to a 10.3% reduction in crime for all 15–21 year olds, to a 10.8% crime reduction for males and to an 8.9% crime reduction for females; Bennett (2018) shows that upper secondary school completion in Denmark leads to a 23 (9) percentage points reduction in the risk of crime and to a 9.8 (3.2) percentage points reduction in the risk of conviction for males (females). Buonanno & Leonida (2006, 2009) document the negative link between education, measured as the average years of schooling of the population, and property crime rates in Italy. Finally, Brilli & Tonello (2018) present evidence of the crime-reducing effect

of education in Italy, showing that a 1 percentage point increase in the enrolment rate leads to a 1.6% reduction in the offending rate among 14 year olds in Italy.

While the consensus in the existing literature is that a higher number of completed years of education reduces crime in the long run, no study to date of which we are aware has directly examined the impact of DA laws on students who would have stayed on in school regardless of the reform. For these individuals, the prolonged compulsory schooling period may imply an extended period with unruly classmates and this may generate learning losses, worsened earnings trajectories and increased risk of criminality.

More broadly, surprisingly little is known about whether and how these reforms alter the school environment. Despite the overall benefits of increased education, including reduced criminality, existing estimates of DA laws do not fully consider the potential displacement of delinquency and violence from the streets into schools, nor the potential additional incidents of violence and bullying into schools. DA laws often rest on a somewhat paternalistic view that juveniles wishing to drop out of school early are actually better off staying on (Messacar & Oreopoulos 2012). Yet surprisingly little is known about their school experience.

The few studies that exist that document potential negative spillovers in school from the prolonged incapacitation in school of juveniles who would have otherwise left school at the earliest convenience use self-reported survey data to study in-school delinquent behaviour and student victimization (e.g., Anderson 2014; Gilpin & Pennig 2015). While survey data has the obvious benefit of capturing information not usually present in primary source administrative data, self-reported survey data may suffer from measurement error (e.g., since respondents may have different reference points), potential recall biases in self-reported victimization, small and non-representative samples, selective responses, and lack

of detailed information of the nature of the crime (Ketel et al. 2020). Moreover, use of self-reported survey data on victimization does not allow the researcher to study the offenders, and thus formulate evidence-based policy prescriptions to minimise the potential negative spillovers of DA reforms on the school environment.

In sum, the lasting crime-reducing impact of DA reforms and completed years of education has been documented in a variety of settings, including the US, UK, Australia, Sweden, Denmark and Italy. The consensus is that DA reforms generate a life-lasting reduction in the risk of committing a criminal offence for the individuals who stayed on in school for longer due to these policy changes. However, relatively little is known about whether and how these reforms may alter the school environment. We view this as an important omission in the literature and an interesting research venture to undertake, as developing an understanding around the changes these policies may cause to the school environment is in fact necessary to assess the desirability of these reforms.

3. Incapacitation, Productivity and Crime

A central question that emerges from the findings of a causal education impact on crime is whether more education from staying on longer is productive, in the Becker sense of raising earnings potential, or whether it reflects incapacitation effects from being kept in the classroom for longer and therefore off the streets and not committing crime. Lochner (2004), for instance, illustrated the negative correlation between student achievement and crime using the FBI's Uniform Crime Report (UCR) and the National Longitudinal Survey of Youth (NLSY) 1979 and documenting that approximately 1 in 3 young men in the US with less than 12 years of schooling earn some form of income from crime, while 24% of male

high school graduates not staying on in school earned income from crime vis-à-vis 17% of men pursuing college.

One means by which the question of productivity versus incapacitation can in principle be untangled is to look at whether a crime-education link exists whilst individuals are still at school or whether it only exists in the longer run as shown in the studies considered in the previous section. It turns out that evidence exists for both channels, as research has aimed to separately identify the two effects. Table 3 and Appendix Table A.2 list 12 studies that look at the incapacitation versus productivity interpretations of the crime-reducing impact of education, with the Appendix Table reporting a richer set of details about the reviewed studies.

Evidence of the incapacitation effect of schooling on crime has been presented in a variety of settings starting from Jacob & Lefgren (2003), who first documented the contemporaneous reduction in property crime and increase in violence that can occur when school is in session. To circumvent the endogeneity of school attendance in the determination of youth crime, this study exploits exogenous variation in school attendance generated by day-to-day changes in school closures for teacher training purposes in 29 jurisdictions in the US. Using data from the US National Crime Victimization Survey (NCVS), it also shows that crimes occurring at school are reported less frequently than those occurring elsewhere. Luallen (2006) presents consistent evidence on the effect of school on the day-to-day propensity of juveniles to commit crime, as it shows that property crime decreases and violence increases when juveniles are in school. In this study, unexpected school closures caused by teacher strikes and 22 years of youth arrest data in Washington State are used for the empirical analysis.

Due to data limitations, both Jacob & Lefgren (2003) and Luallen (2006) study the impact of school attendance on contemporaneous crime at the level of the locality. Similarly, and more recently, Berthelon & Kruger (2011) investigate the impact of the length of the school day on crime exploiting a school reform in Chile that lengthened the school day from half to full-day. The analysis shows that an increase by 20 percentage points in the municipal share of full-day high schools leads to a 3.3% reduction in the probability of motherhood in adolescence and to an 11% to 24% reduction in the youth crime rate. Overall, the consensus in this literature is that the incapacitation effect is a key ingredient behind the crime-reducing effect of schooling, as compulsory school attendance exerts a contemporaneous crime-reducing effect especially for property crime that typically occurs outside school.

On the other hand, one other way in which school attendance may reduce the risk of crime is by boosting the productivity of individuals and thus increase their opportunity cost of committing crime. Evidence of the productivity effect of schooling and how this may lead to reduced crime has also been retrieved in a variety of settings and, for the most part, with a focus on early childhood education. In a seminal study, Heckman et al. (2006) used the NLSY 1979 to show that boosting the skills of males in the lowest decile of cognitive distribution from the lowest to the highest decile of noncognitive distribution substantially reduces the risk of incarceration, while moving the same males in the lowest deciles of both distributions to the highest decile of cognitive distribution only slightly reduces the risk of incarceration.

Building on these findings, more recent research has sought to examine the long-term benefits of early childhood interventions on disadvantaged children in the US. Johnson & Jackson (2019) focus on Head Start and they show that, for poor children exposed to a 10% increase in K–12 spending, exposure to Head Start increased their years of education,

their likelihood to graduate in high school and their wages. For the same children, exposure to Head Start also reduced the risk of incarceration and the risk to be poor as an adult.

García et al. (2023) examine instead the High Scope Perry Preschool Project. Their findings show that this initiative generated long-lasting improvements in the skills of the original participants, who appear more likely to be married at age 30, have $10,000 of additional average annual earnings, exhibit reduced criminal activity, and seem to conduct a healthier life. Children of the original participants also seem to benefit from this programme, as they appear less likely to have ever been suspended in school, more likely to be employed, and they too exhibit reduced criminal activity and better health. Gray-Lobe et al. (2023) study the effects of universal preschool in Boston, showing that preschool enrolment increases the likelihood of college attendance, SAT test-taking and high school graduation. Preschool is also negatively associated with the likelihood of disciplinary measures including juvenile incarceration, but has no detectable impact on state achievement test scores. Anders et al. (2023) complement this literature by exploiting the rollout of Head Start and Smart Start in North Carolina and showing that access to improved early childhood education reduces the likelihood of a serious criminal conviction in adulthood by 20%.

Some recent papers have also exploited discontinuous rules in the minimum school-entry eligibility to investigate the productivity effect of schooling in early childhood. In particular, Cook & Kang (2016) show evidence from North Carolina that delayed entry eligibility can reduce criminality at age 13-15 by 31.8%. This is consistent with the finding that starting school at an older age leads to a significant academic advantage from childhood and thus, arguably, makes schooling more productive (Bedard & Dhuey 2006; Datar 2006; Puhani & Weber 2007; McEwan & Shapiro 2008; Elder & Lubotsky 2009; Crawford et al.

2010; Black et al. 2011; McCrary & Royer 2011). Cunha & Heckman (2008) in fact suggest that starting school at an earlier age may have significant lifetime effects, as it has the potential to alter the entire path of skill acquisition.

However, Cook & Kang (2016) also show that delayed entry eligibility can increase by 14% the risk of engaging in serious criminal activity after reaching the dropout age (DA), i.e, at age 17-19. This is because the DA legislation in North Carolina is defined in terms of age and not grade completion: as a result, delayed entry eligibility causes juveniles to reach the DA almost one year earlier than their counterpart born on the other side of the discontinuous cutoff determining school eligibility. Thus, these juveniles appear more likely to drop out of school before secondary school completion and to commit crime at age 17-19. Landersø et al. (2016) present additional evidence from Denmark that delayed entry eligibility can reduce criminality at (by) all ages until age 19 (22) for boys and at (by) age 15 (19) for girls. Finally, Depew & Eren (2016) present evidence from Louisiana of the importance of being born right after the school entry cutoff, as this leads black females to a reduced likelihood to commit a juvenile crime. IV estimates also show that late school entry by one year leads black females to a reduced likelihood to commit a juvenile crime.

4. School Quality and Crime

What is by now a significant body of research, much of which is a very recent development in the past ten years, explores the mechanisms by which education may lead to lower crime at different stages of the education process. This research covers early age interventions, primary and secondary schooling and policy changes that alter the school dropout age. Reflecting the importance of the quality and not just the quantity of education in the determination of contemporaneous and future criminality, a large literature has developed

at a remarkable rate in the last decade. Table 4 and Appendix Table A.3 list 24 studies that extend the education dimension to cover both quality and quantity and assess its impact on crime both in the short run when individuals are in school and once they have finished their compulsory education. Also in this case the Appendix Table contains a fuller set of details on the reviewed studies.

Starting from Gaviria & Raphael (2001), who documented peer group influences in risky behaviours and that drug use by parents correlates with increased probabilities of drug, alcohol, and tobacco consumption by their children, several studies document the importance of the school environment and schooling quality. Cullen et al. (2006) were perhaps the first to exploit admission lotteries into high-achieving schools in Chicago to show that lottery winners feature nearly 60% lower self-reported arrest rates compared with the pool of lottery losers. Deming (2011) exploits a similar lottery experiment in Charlotte-Mecklenburg to show that random admission into a better-achieving school can lead to roughly a 50% reduction in criminality among high-risk youth relative to lottery losers. Billings et al. (2014) present evidence from a discontinuous school boundary change also in Charlotte-Mecklenburg that a 10 percentage point increase in assigned school share minority can cause an 8% increase in arrest and incarceration rates among minority males. Billings & Hoekstra (2023) present evidence from the same setting of Charlotte-Mecklenburg that parents of school peers also matter, as an increase in school peers linked to parental arrest leads to a reduction in school achievement and to an increase in adult arrest rates. Bacher-Hicks et al. (forthcoming) corroborates the evidence on the importance of school quality by showing that attending schools with higher suspension rates can lead to increased arrest and incarceration rates. As far as grade retention is also negatively correlated with the quality of education, Eren et al. (2022) constitutes a close complement

to this as it shows that grade retention increases the risk of criminal conviction by age 25 in Louisiana. Pope & Zuo (2023) document the link between suspension rates and student performance in LA.

Consistent evidence has been retrieved over the last ten years also in other settings within and outside the US. Dobbie & Fryer (2015) exploit admission lotteries in New York City to show that admission into a high-performing charter school leads to a 10.1 percentage point reduction in the likelihood of teenage pregnancy and to a 4.4 percentage point increase in the risk of male incarceration. McEachin (2020) explores the consequences of charter school attendance in North Carolina finding that, compared with students who attended a traditional public school in both 8th and 9th grade, charter school entrants face reduced risk to commit a crime and to be convicted for a misdemeanour or a felony offence. Huttunen et al. (2023) show that admission of men to over-subscribed secondary schools in Finland can reduce their risk of conviction in a district court within 10 years after admission by 52%.

Reflecting on what constitutes a good school, Jackson et al. (2020) complement this literature by presenting evidence from Chicago of the crime-reducing impact of attendance of schools with high socio-emotional development value added. In particular, this study shows that higher social value added, greater work hard value added and greater test score value added lead to reduced risk of arrest. By way of contrast, Beuermann et al. (2023) show that schools' impacts on high-stakes tests are weakly related to impacts on arrests, dropout, teen motherhood, and formal labour market participation. Golberstein et al. (forthcoming) also show that school-based mental health services do not seem to affect average standardised test scores but lead to an approximate 10% reduction in the risk of out-of-school suspension and to a 25% reduction in the risk of youth justice involvement. Jackson (forthcoming) suggests that the conversion of low-performing schools from coeducational

to single-sex schools may generate benefits to students, as the policy experiment from Trinidad and Tobago he examines indicates that academic achievement three years after secondary school entry improved, the risk of boys to be arrested by the age of 18 decreased by 60% and the risk of girls to have a live birth by the age of 18 decreased by 40%.

Jackson et al. (2024) further examine what students are most likely to benefit from attending better schools. Their findings indicate that, for students in the bottom (top) decile of the distribution of educational advantage, attending a school at the 85th percentile of the effectiveness distribution vis-à-vis one at the median is associated with a 3.8 (0.5) percentage point increase in the likelihood of high school graduation, a 3.6 (1.5) percentage point increase in the likelihood of college going, and a 2.1 (0.22) percentage point reduction in the risk of arrest. Jordan et al. (2024) document that moving a Black, male, 8th grade student in Chicago from a 10th to a 90th percentile school in the distribution of school effectiveness at promoting on-time matriculation from 8th to 9th grade decreases future felony arraignment rates by more than five percentage points and reduces future prison admission rates by more than four percentage points.

Recent studies have turned the attention to the importance of the availability of schools in early childhood and primary school age, which may of course affect both the quantity and the quality of the education received by a pupil. Eriksson (2020) exploits the Rosenwald programme, i.e., a school construction programme in the US, to study the crime-reducing effect of childhood access to primary schooling in the US. The findings indicate that exposure to one new primary school built as part of the Rosenwald programme reduces the risk of incarceration. Benson et al. (forthcoming) document that eligibility to enrol in kindergarten at age five in the US leads to 5-10% greater counts of investigated reports for

children aged five. Baron et al. (forthcoming) also show that greater operating expenditure in elementary school in Michigan generate reduced arrest rates in adulthood.

Finally, a further dimension of school quality that is examined in this literature concerns the strategic use of discipline sanctions and discrimination by school principals towards low-performing students and ethnic minorities. Figlio (2006) was perhaps the first study to focus on this dimension of school quality as he presents evidence from Florida that, for the same acts of misconduct, low-performing students receive harsher sentences during periods of high-stakes exams. Figlio (2006) also shows that greater manipulation of aggregate school-level results is associated with a higher likelihood that a student will attain level 2 or better on the FCAT reading exam and a higher likelihood that a student will attain level 2 on the FCAT mathematics exam. More recently, Barrett et al. (2021) and Liu et al. (2024) have shown that, in Louisiana and in California respectively, black students are 13 percentage points and 67% more likely to be suspended than white students involved in the exact same incidents.

5. The Impact of Crime on Education

All the literature reviewed so far covers the work that considers the effect of education acquisition on the crime histories and experiences of individuals. However, causation may also go in the opposite direction as crime histories and experiences may potentially impact subsequent education acquisition. Table 5 and, with a greater level of detail, Appendix Table A.4 list 16 studies that focus on the impact of crime exposure of various kinds, ranging from being arrested to crime victimization, on subsequent education acquisition.

Harlow (2003) shows that, in the US, 40% of individuals without a high school diploma and 45% of individuals with a GED had prior youth sentences; in contrast, only

26% of individuals with a high school diploma and 21% of those with some college display some prior youth sentences, suggesting that youth sentences might affect the subsequent acquisition of education. However, the first causal evidence on this appears in Hjalmarsson (2008), as she shows that incarceration in the US leads to a sizeable reduction in the likelihood of graduation. Similarly, Aizer & Doyle (2015) also shows evidence from Chicago of the negative impact of youth incarceration on the likelihood of high school graduation and its positive impact on the risk of adult incarceration. Eren & Mocan (2021) coherently show that juvenile incarceration can increase the probability of adult conviction for a drug offense, while they find null effects for violence. Arteaga (2023) shows that parental incarceration may actually improve the student performance of children.

Subsequent studies have shifted away from offenders and focus on the impact of crime victimization on the acquisition of education. Brück et al. (2019) show that exposure to the Israeli-Palestinian conflict reduced the probability of students passing the final exam, their total test scores and their probability of being admitted to university. Michaelsen & Salardi (2020) present evidence from Mexico on the detrimental effect of exposure to homicides in the week prior to exams on student test scores, while Ang (2021) shows evidence from LA on the detrimental effects of exposure to police violence on GPA scores, emotional disturbance, high school completion and college enrolment. González & Prem (2024) also show harmful effects of police killings for students and classmates of victims in Chile. Koppensteiner & Menezes (2021) instead show that also exposure to other forms of homicides (i.e., not police killings) on the way to school in Sao Paulo cause a detrimental effects on students' performance and increase their risk of school dropout.

A final set of studies also investigates the effects of school peers who were exposed to violence in early childhood on the risk of youth criminality. In particular, Carrell &

Hoekstra (2010) first show that one more troubled boy peer in a class of 20 students may significantly reduce boys' test scores and it may significantly increase their count of disciplinary infractions. Padilla-Romo & Peluffo (2023) show consistent evidence from Mexico. Carrell et al. (2018) complement these studies by focusing on the long-run effects of disruptive peers, and they show that exposure to a disruptive peer in classes of 25 students in elementary school can lead to a 3% reduction in earnings at the age of 24-28. Sarzosa (2024) shows that bullying victimization can cause a significant reduction in the current skill levels for the average child and this skill depletion may increase by 34% the likelihood to experience bullying again. Levine & McKnight (forthcoming) also document the lasting detrimental impact of high-fatality school shootings.

In sum, there is strong evidence of how both criminal activity and criminal victimization can negatively affect student performance and education acquisition. However, surprisingly little evidence exists to date on the long run effects of exposure to violence on the professional trajectories of individuals. Little evidence also appears on whether, how and why males and females might be affected differently by the exposure to crime. Finally, relatively little evidence appears on the intergenerational effects of criminal victimization on the human capital acquisition and social mobility of children. These appear as promising routes for future research.

6. Other Crime-Education Research

The focus so far has been on what we identify as the four main tranches of research that can be classified together, which does mean we have therefore not fully covered all of the research in the area. Indeed, the Doleac list of published papers used to compile the numbers in Table 1 does have more articles that are not easily classifiable into the four tranches

considered to date. There are 20 more publications, some of which are more generally about crime policies but that do also feature some discussions of education (sometimes a little more peripherally than the material covered in Sections 2 to 5) and also a more miscellaneous set of papers considering a much more heterogeneous range of questions in a wide range of contexts. These are listed in two more Tables A.5 and A.6 that are also available in the online appendix and cover additional crime-education aspects.

Appendix Table A.5 lists 14 papers that study policies that aimed to either boost skills or reduce criminality, or a combination of the two. As such, while we do not view these papers as part of the four tranches discussed before, we do view them as part of the literature on the link between education and crime. One takeaway that emerges from this review is that programmes targeting behavioural issues among juveniles and keeping them busy have been found to be very effective (Heller et al. 2017; Heller 2022; Gulesci et al. 2021). Some papers have also documented the effectiveness of the combination of mixed interventions that comprise both behavioural interventions and cash transfers (see Sabates & Feinstein 2008; Blattman et al. 2017). Dustmann et al. (forthcoming) also shows the important consequences of removing financial transfers to refugees and their children.

Some other papers have also evaluated a whole range of initiatives to improve the level of safety of the school environment (Owens 2017; Anderson & Sabia 2018; Weisburst 2019; Rees et al. 2022; and Sorensen et al. 2023). Other programmes related with education and crime that appear in the recent literature include parental language training of refugees (Foged et al. 2023), the opening of women's justice centres (Sviatschi & Trako 2024) and prison rehabilitation programmes (Arbour et al. forthcoming).[3]

[3] A further 6 papers, covering miscellaneous crime-education issues that we do not classify to the other groupings in Tables 2-5 and Appendix Tables A1-A5, are shown for completeness in Table A6.

7. Conclusion

Empirical study of connections between crime and education have been a key development and one of the key research areas featuring in the upsurge of published research and interest in the economics of crime that has occurred over the past two decades. A lot has been learnt in this period about the causal crime-reducing impact of education, the means by which education-induced criminality drops come about through quality and quantity aspects of education, and circumstances where crime experiences can act to hinder education acquisition. This is a rapidly growing economic research area, and we have reviewed what we consider to be the four main tranches of the crime-education area. The expectation of more research to come in this area is high as methodological developments, data innovations and high policy interest will likely drive more research that probes deeper into the relationship between crime and education.

Table 1. Publications By Decade

	Annualised Numbers and Shares			
	1990s	2000s	2010s	2020s
Economics of Crime Publications	6	19	37	76
Crime and Education Publications	0	1	3	8
Percent Share Crime and Education	0%	5%	5%	11%

Notes: The publication data are sourced from the database maintained by Jennifer Doleac; see https://jenniferdoleac.com/resources/ for a link to the database. The database includes crime and criminal justice system related papers in 21 general interest and top field economics journals: AER, QJE, RESTUD, JPE, Econometrica, RESTAT, JEEA, AEJ: Applied, AEJ: Policy, AER: Insights, EJ, JOLE, JPUBE, JLE, JURBANE, JPAM, JHR, JDE, JEH, EEH, JHE. Classification as crime and education publications done by the authors.

Table 2. Literature in Economics on the Link between Crime and Education, Completed Education and Dropout Age Laws

Study	Treatment	Causal Impact / Correlation
Lochner and Moretti (2004)	Educational attainment and school quality	One additional year of schooling leads to ↓ 0.1 pp incarceration for white men and ↓ 0.3-0.5 pp incarceration for black men
Buonanno and Leonida (2006)	Secondary school attendance	Education, measured as the average years of schooling of the population, is linked with ↓ crime rate
Buonanno and Leonida (2009)	Secondary school attendance	Education, measured as the average years of schooling of the population, is linked with ↓ property crime rate
Machin et al. (2011)	Secondary school attendance and school qualification	A 10% increase in age left school leads to ↓ 2.1% crime for males
Anderson (2014)	Secondary school attendance	Compared with MDA 16-17 laws, MDA 18 laws lead to a ↓ 17.2% arrest rates, of which a ↓ 9.9% property and a ↓ 22.5% violent crime arrest rates of youth aged 16-18.
Bell et al. (2016)	Secondary school attendance	A one year rise in the MDA from 16 to 17 leads to a ↓ 12.6% in arrests for property crimes, while a less strong relation appears for violent crimes. Higher dropout age laws and longer compulsory schooling also significantly reduce the risk of incarceration.
Beatton et al. (2017)	Secondary school attendance	Exposure to the MDA reform led to a ↓ 10.3% crime for all 15–21 year olds, to a ↓ 10.8% crime for males and to a ↓ 8.9% crime for females.
Bennett (2018)	Upper secondary school completion	Upper secondary school completion leads to a ↓ 23 pp crime and to a ↓ 9.8 pp conviction for males, as well as to a ↓ 9 pp crime and to a ↓ 3.2 pp conviction for females.
Brilli and Tonello (2018)	Secondary school attendance	A 1pp increase in enrollment rate leads to a ↓ 1.6% offending rate among 14 year olds
Cano-Urbina and Lochner (2019)	Educational attainment and school quality	One additional year of schooling leads to ↓ 0.04 pp incarceration rates for white women and ↓ 0.08 pp incarceration rates for black women
Gilpin and Pennig (2015)	Secondary school attendance	High schools in states that raise their MDA law to 18 experienced ↑ 21.4% school crimes
Hjalmarsson et al. (2015)	Educational attainment	One additional year of schooling leads to ↓ 6.7% risk of conviction of men and to ↓ 15.5% incarceration of men, while estimates for women are similar in magnitude but not statistically significant.
Bell at al. (2022)	Secondary school attendance	Exposure to the MDA reforms leads to a ↓ 6.1% log arrest rates for young adults

Table 3. Literature in Economics on the Link between Crime and Education, Incapacitation and Productivity

Study	Treatment	Causal Impact / Correlation	Study	Treatment	Causal Impact / Correlation
Jacob and Lefgren (2003)	School attendance	Youth property crime ↓ 14% on days when school is in session; violent crime ↑ 28% on such days	Depew and Eren (2016)	School entry age	Birth after school entry cutoff leads black females to a ↓ 3 pp in risk of youth crime. IV estimates show that late school entry by one year leads black females to a ↓ 3.5 pp in risk of a youth crime.
Lochner (2004)	High school dropout	Roughly 30% (33%) of young men with <10 (≤11) years of schooling earn income from crime. 24% of male high school graduates not staying on in school and 17% of men pursuing college earn income from crime.	Landersø et al. (2017)	Delayed Entry Eligibility (DEE)	DEE leads to ↓ criminality at (by) all ages until age 19 (22) for boys and at (by) age 15 (19) for girls
Heckman et al. (2006)	Boosting cognitive and noncognitive skills	Moving males in lowest decile of cognitive distribution from lowest to highest decile of noncognitive distribution substantially ↓ incarceration. Moving same males in lowest deciles of both distributions to highest decile of cognitive distribution only slightly ↓ incarceration.	Johnson and Jackson (2019)	Early childhood exposure to investments designed to promote school readiness among disadvantaged children	For poor children exposed to a 10% increase in K–12 spending, exposure to Head Start led to ↑ 0.59 additional years of education, ↑ 14.8 pp likely to graduate high school, ↑ 17% higher wages, ↓ 4.7pp likely to be incarcerated, and ↓ 12pp less likely to be poor adults
Luallen (2006)	School attendance	Youth crime ↑ 21.4% on days when strikes occur. In particular on such days, mischievous crime ↑ 48%, property crime ↑ 28.8% and violent crime ↓ 31.5%	Anders et al. (2023)	Early childhood education.	Improvements to early childhood education led to ↑ 20% reductions in the likelihood of a serious criminal conviction in adulthood.
Berthelon and Kruger (2011)	Length of the school day	An increase of 20 pp in the municipal share of full-day high schools leads to a ↓ 3.3% in the probability of motherhood in adolescence and to a ↓ 11% to 24% in the juvenile crime rate.	Garcıa et al. (2023)	Long-term benefits of early childhood intervention on disadvantaged children	The intervention led to lasting ↑ 0.2–0.4 standard deviation in the original participants' skills, ↑ 10 pp more likely to be married at age 30, ↑ $10,000 average annual earnings, ↓ 1 pp in criminality, and ↑ 15 pp healthier. Children of the original participants have ↑ 16.9 pp in likelihood of never being suspended and ↑ 25.8 pp in likelihood of employment, reduced criminality, and better health
Cook and Kang (2016)	Delayed Entry Eligibility (DEE)	DEE leads to ↓ 31.8% criminality at age 13-15 and ↑ 14% serious criminality at age 17-19	Gray-Lobe et al. (2023)	Public preschool attendance	Preschool enrollment leads to ↑ 18% in college attendance, ↑ 9 pp in SAT test-taking and ↑ 6 pp in high school graduation. Preschool also leads to ↑ 0.17 standard deviation in disciplinary measures including juvenile incarceration, but with no detectable impact on state achievement test scores.

Table 4. Literature in Economics on the Link between Crime and Education, School Quality and Quantity

Study	Treatment	Causal Impact / Correlation	Study	Treatment	Causal Impact / Correlation
Gaviria and Raphael (2001)	Peer group influences.	Drug use by parents correlated with ↑ probabilities of drug, alcohol, and tobacco consumption by their children by 19.4%, 13%, and 10.3%, respectively.	Beuermann et al. (2023)	Whether schools' impact on test scores measure their overall impact on students	Schools' impacts on high-stakes tests are weakly related to impacts on arrests, dropout, teen motherhood, and formal labour market participation.
Cullen et al. (2006)	High-achieving school attendance	Lottery win to high-achieving school leads to nearly ↓ 60% self-reported arrest rates relative to lottery losers	Billings and Hoekstra (2023)	School and neighbourhood peers whose parents have been arrested	A 5 pp increase in school peers linked to parental arrest leads to ↓ 0.016 standard deviation in school achievement and to ↑ 5% in adult arrest rates.
Figlio (2006)	High stakes testing.	A one standard deviation increase in the test window manipulation measure is associated with a ↑ 1.2 pp in the likelihood that a student will attain level 2 or better on the FCAT reading exam and a ↑ 1.7 pp in the likelihood that a student will attain level 2 on the FCAT mathematics exam.	Huttunen et al. (2023)	Secondary education	Admission of men to secondary schools leads to ↓ 52% risk of conviction in a district court within 10 years after admission compared with men who are not admitted.
Deming (2011)	Better-achieving school attendance	Lottery win to better-achieving school leads to roughly ↓ 50% criminality among high-risk youth relative to lottery losers	Pope and Zuo (2023)	School suspension.	10 pp lower suspension rates lead to ↓ 0.040 standard deviation in math and ↓ 0.065 standard deviation in English test scores, ↓ 0.07 standard deviation in grade point averages and ↑ 15.1% absences.
Billings et al. (2014)	School share minority	10 pp increase in assigned school share minority leads to ↑ 8% arrest and incarceration among minority males	Jackson et al (2024)	Attending an effective high school	For students in the bottom (top) decile of the distribution of educational advantage, attending a school at the 85th percentile of the effectiveness distribution vs one at the median is associated with a ↑ 3.8 (0.5) p.p. in high school graduation, a ↑ 3.6 (1.5) p.p. in college going, and a ↓ 2.1 (0.22) p.p. in risk of being arrested.
Dobbie and Fryer (2015)	High-performing charter school attendance	Lottery win to high-performing charter school leads to ↓ 10.1 pp teenage pregnancy and ↓ 4.4pp male incarceration	Liu, Hayes and Gershenson (2024)	Racial Disparities in Exclusionary Discipline	Following fights between black and white students, black students are 2 pp (67%) more likely to be suspended than white students involved in the exact same incident.
Eren et al. (2017)	Summer school and grade retention.	Grade retention ↑ 3pp the propensity of a student to drop out of school.	Jordan et al (2024)	Racial Differences in Academic Outcomes and Neighbourhood Quality during Childhood	Moving a Black, male, 8th grade student from a 10th to a 90th percentile school in the distribution of school effectiveness at promoting on-time matriculation from 8th to 9th grade leads to over ↓ 5 pp in future felony arraignment rates and to over ↓ 4 pp in future prison admission rates.

Eriksson (2020)	Childhood access to primary schooling	Exposure to one new primary school built as part of the Rosenwald programme leads to ↓ 1.9 pp risk of incarceration.	Bacher-Hicks et al (forthcoming)	School Suspensions	1σ higher suspension effect leads to ↑ 17% arrest and to ↑ 20% incarceration
Jackson et al (2020)	Attendance of schools with high socio – emotional development (SED) value added	Higher social value added leads to ↓ 0.728 pp risk of arrest; greater work hard value added leads to ↓ 0.766 pp risk of arrest; greater test score value added leads to ↓ 0.523 pp risk of arrest	Baron et al (forthcoming)	Public school funding	10% additional operating expenditure during elementary school leads to ↓ 15% in likelihood to be arrested in adulthood.
McEachin (2020)	Charter school attendance	Compared with students who attended a traditional public school in both 8th and 9th grade, charter school entrants face ↓ 0.9 pp risk to commit any crime, and ↓ 0.7 and ↓ 0.4 pp risk to be convicted for a misdemeanour and felony off bases of 3, 0.2, 1.3 pp	Benson et al (forthcoming)	Time with teachers and in school	Eligibility to enroll in kindergarten at age five leads to ↑ 5-10% in number of investigated reports for children aged five
Barrett et al. (2021)	Student discipline disparities by race and family income	Black (poor) students are ↑ 13 (9) pp more likely to be suspended in a given year than white (non-poor) students.	Golberstein et al (forthcoming)	School-based mental health services	School-based mental health services do not seem to affect average standardised test scores but lead to an approx ↓ 10% in the risk of out-of-school suspension and to ↓ 25% in the risk of juvenile justice involvement.
Eren et al. (2022)		Grade retention leads to ↑ 1.05pp in the likelihood of conviction by age 25.	Jackson (forthcoming)	Single-Sex Education in Low-Performing Schools	The transition to single-sex leads to ↑ 0.2 % sd in academic achievement three years after secondary school entry, to ↓ 60% in risk of boys to be arrested by the age of 18 and to ↓ 40% in risk of girls to have a live birth by the age of 18.

Table 5. Literature in Economics on the Impact of Crime on Education

Study	Treatment	Causal Impact / Correlation
Harlow (2003)	Education achievement of inmates.	Inmates' education links with ↓ youth sentencing, as roughly 40% without high school diploma, 45% with a GED, 26% with a high school diploma, 21% with some college had prior youth sentences either to a facility or probation.
Hjalmarsson (2008)	Arrest, charge, conviction, incarceration at age 16 or younger.	When correcting for unobservables, incarcerations still lead to roughly ↓ 13 pp likelihood of graduation
Carrell and Hoekstra (2010)	Exposure to children from troubled families.	Adding one more troubled boy peer to a classroom of 20 students leads to a ↓ nearly 2 percentile points (one-fifteenth of a sd) in boys' test scores, and to a ↑ 40% in the number of disciplinary infractions committed by boys.
Aizer and Doyle (2015)	Youth incarceration.	Youth incarceration leads to ↓ 13 pp high school graduation and ↑ 23 pp adult incarceration.
Brown and Velásquez (2017)	Drug-related violence.	Increased local violence leads to ↓ 0.3 years of education, ↓ 8 pp likelihood of compulsory school completion, and ↑ likelihood of employment.
Carrell et al. (2018)	Exposure to a disruptive peer in elementary school.	Exposure to a disruptive peer in classes of 25 in elementary school leads to ↓ 3% earnings aged 24-28.
Bruck et al. (2019)	Effect of the Israeli–Palestinian conflict on education outcomes.	The conflict leads to ↓ probability of passing the final exam, ↓ in the total test score, and ↓ in the probability of being admitted to university.
Michaelsen and Salardi (2020)	Exposure to violence.	Exposure to at least three homicides within a 2km radius in the week immediately prior to exams leads to ↓ 0.1 in standard deviation of test scores.
Ang (2021)	Police killings.	Exposure to police violence leads to ↓ 0.04 points in GPA, ↑ 15% incidence of emotional disturbance, ↓ 3.5% rates of high school completion and ↓ 2.5% college enrollment.
Eren and Mocan (2021)	Impact of juvenile punishment on adult criminal recidivism and high school completion	Negative effect on high school completion for earlier cohorts, but no impact on later cohorts. Juvenile incarceration leads to ↑ 27 pp in the probability of adult conviction of a drug offense, null effect for violence.
Koppensteiner and Menezes (2021)	Effect of exposure to homicides around schools, students' residences, and on way to school.	Violence leads to ↓ 5% standard deviation test scores and to ↑ 20% dropout rates.
Arteaga (2023)	Parental incarceration.	Parental incarceration leads to ↑ 0.78 years in educational attainment for children of convicted parents.
Padilla-Romo and Peluffo (2023)	Out-migration from violence-affected areas and peer exposure to violence.	Adding a new peer who was exposed to local violence to a class of 20 students leads to ↓ 2% standard deviation in incumbents' academic performance.
González and Prem (2024)	Police violence	Police killings lead to ↓ 7 pp in the probability that the schoolmates of the victim skip school in protest days, to ↑ 13 pp in the likelihood to participate in the student-led boycott and to ↓ 29 pp in the chance of taking exam to access higher education.
Sarzosa (2024)	Bullying victimization	Victimization leads to ↓ 40% sd in current skill levels for the average child, and this skill depletion leads to ↑ 34% in likelihood to experience bullying again.
Levine and McKnight (forthcoming)	High-fatality school shootings	High-fatality school shooting at Sandy Hook (Parkland) lead to ↓ 0.10 sd in math test scores (↓ 0.37 sd in US history) and ↓ 0.13 sd in ELA test scores (↓ 0.51 sd in in geometry) in grades 3-8; to ↓ 0.22 sd in math test scores and ↓ 0.13 sd in ELA test scores in grades 3-4; and to ↑ 1.9 pp in risk of chronic absenteeism. The Columbine shooting lead to ↑ 7.8 suicides and ↑ 7.5 accidental deaths among male survivors by age 29.

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Online Appendix

Appendix Table A.1. Literature in Economics on the Link between Crime and Education, Completed Education and Dropout Age Laws

Study	Setting	Data	Treatment	Research Design	Correlation	Causal Impact
Lochner and Moretti (2004)	US	US Census data from 1960-1980 on males aged 20-60; 1960-90 FBI's Uniform Crime Reports; National Longitudinal Survey of Youth	Educational attainment and school quality	Minimum Dropout Age (MDA) to define an Instrumental Variable (IV) model in a difference in difference specification	One additional year of schooling leads to ↓ 0.1 pp incarceration for white men and ↓ 0.37 pp incarceration for black men	One additional year of schooling leads to ↓ 0.1 pp incarceration for white men and ↓ 0.3-0.5 pp incarceration for black men
Buonanno and Leonida (2006)	Italy	Annual panel dataset for Italian regions (NUTS2) from 1980-95; Centre for North South Economic Research (CRENoS); ISTAT (Italian Statistics Bureau) population data	Secondary school attendance	Instrumental variable approach for panel data using the GMM-system estimator	Education, measured as the average years of schooling of the population, is linked with ↓ crime rate	
Buonanno and Leonida (2009)	Italy	Annual panel dataset for Italian regions (NUTS2) from 1980-95; Centre for North South Economic Research (CRENoS); ISTAT (Italian Statistics Bureau) population data and ISTAT Quarterly Labour Force Surveys.	Secondary school attendance	Region and time fixed effects as well as region-specific time trends	Education, measured as the average years of schooling of the population, is linked with ↓ property crime rate	
Machin et al. (2011)	England and Wales	Offenders Index Database (OID) on criminal histories of offenders aged 18–40, born in 1946-70 and convicted of standard list offences from 1963 onwards; Office for National Statistics (ONS) population data by age cohort and year, separately for men and women; the UK General Household Survey (GHS) for the 1972-96 years; 2001-08 British Crime Survey	Secondary school attendance and school qualification	Minimum Dropout Age (MDA) to define a Regression Discontinuity (RD) design	A 10% increase in age left school is correlated with ↓ 2.1% for males	A 10% increase in age left school leads to ↓ 2.1% crime for males
Anderson (2014)	US	FBI's Uniform Crime Reports (UCR) from 1980-2008; the National Center for Education Statistics' Digest of Education Statistics; U.S. Census Bureau; Bureau of Economic Analysis; Youth Risk Behavior Survey.	Secondary school attendance	Minimum Dropout Age (MDA) reforms to specify a difference-in-difference-in-difference (DDD) approach	Compared with MDA 16-17 laws, MDA 18 laws correlated with ↑ arrest rates of youth aged 13-15 and 16-18.	Compared with MDA 16-17 laws, MDA 18 laws lead to a ↓ 17.2% arrest rates, of which a ↓ 9.9% property and a ↓ 22.5% violent crime arrest rates of youth aged 16-18.
Bell et al. (2016)	US	Arrest data from the FBI Uniform Crime Reports (UCR); CSL and education data from the US Census from the Integrated	Secondary school attendance	Minimum Dropout Age (MDA) to define a Regression Discontinuity (RD) design		A one year rise in the MDA from 16 to 17 leads to a ↓ 12.6% in arrests for property crimes, while a

		Public Use Microdata Series (IPUMS); data on commuting zones using Census Public Use Micro Areas (PUMAs); individual-level data on incarceration using the IPUMS Census/ACS data.			less strong relation appears for violent crimes. Higher dropout age laws and longer compulsory schooling also significantly reduce the risk of incarceration.
Beatton et al. (2017)	Queensland, Australia	Queensland administrative data from the Department of Education and Training matched at the individual level with the Queensland Police Service from 2002-13.	Secondary school attendance	Minimum Dropout Age (MDA)	Exposure to the MDA reform led to a ↓ 10.3% crime for all 15–21 year olds, to a ↓ 10.8% crime for males and to a ↓ 8.9% crime for females.
Bennett (2018)	Denmark	Administrative Danish Register Data on twins born in 1965–82	Upper secondary school completion	OLS on sample of twins and with twin fixed effects	Upper secondary school completion leads to a ↓ 23 pp crime and to a ↓ 9.8 pp conviction for males, as well as to a ↓ 9 pp crime and to a ↓ 3.2 pp conviction for females.
Brilli and Tonello (2018)	Italy	Yearly aggregate data on school enrollments and youth crime from the administrative records of the Statistical Office of the Italian Ministry of Education (MIUR) and the Italian National Institute of Statistics (ISTAT) for the 1997/98 to 2001/02 school years; Labor Force Survey (ISTAT); Public Finance Database (Italian Ministry of the Interior), Italian Demographic Database (ISTAT); survey VS data on victimization from 1999-2008.	Secondary school attendance	Minimum Dropout Age (MDA) to define an Instrumental Variable (IV) model in a difference in difference specification	A 1pp increase in enrollment rate leads to a ↓ 1.6% offending rate among 14 year olds
Cano-Urbina and Lochner (2019)	US	US Census data from 1960-1980; 1960-90 FBI's Uniform Crime Reports	Educational attainment and school quality	Minimum Dropout Age (MDA) to define an Instrumental Variable (IV) model	One additional year of schooling leads to ↓ 0.04 pp incarceration rates for white women and ↓ 0.08 pp incarceration rates for black women
Gilpin and Pennig (2015)	US	School Survey on Crime and Safety (SSOCS, 2004, 2006, 2008, 2010).	Secondary school attendance	Reduced form analysis of Minimum Dropout Age (MDA) laws in a difference in difference specification	High schools in states that raise their MDA law to 18 experienced ↑ 21.4% school crimes
Hjalmarsson et al. (2015)	Sweden	25% random sample from Sweden's Multigenerational Register on all persons born from 1943-54 who have lived in Sweden at any time since 1961 matched with data on parents, siblings and children;	Educational attainment	Minimum Dropout Age (MDA) to define an Instrumental Variable (IV) model	One additional year of schooling leads to ↓ 6.7% risk of conviction of men and to ↓ 15.5% incarceration of men, while estimates for women are similar in

		Sweden's Education Register and 1970 Census of Sweden; Sweden's National Council for Crime Prevention records of all criminal convictions from 1973-2007 for each individual.				magnitude but not statistically significant.
Bell at al. (2022)	US	FBI Uniform Crime Report (UCR) from 1974 onwards for males aged 15–24 years old	Secondary school attendance	Minimum Dropout Age (MDA) to define a Regression Discontinuity (RD) design	Cohorts exposed to the MDA reforms face a ↓ 4.6% arrest rate	Exposure to the MDA reforms leads to a ↓ 6.1% log arrest rates for young adults

Appendix Table A.2. Literature in Economics on the Link between Crime and Education, Incapacitation and Productivity

Study	Setting	Data	Treatment	Research Design	Correlation	Causal Impact
Jacob and Lefgren (2003)	US	29 urban jurisdictions in NIBRS data, detailed school calendar	School attendance	Teacher in-service days		Youth property crime ↓ 14% on days when school is in session; violent crime ↑ 28% on such days
Lochner (2004)	US	National Longitudinal Survey of Youth 1979 and FBI's Uniform Crime Report (UCR)	High school dropout	OLS	Roughly 30% (33%) of young men with <10 (≤11) years of schooling earn income from crime. 24% of male high school graduates not staying on in school and 17% of men pursuing college earn income from crime.	
Heckman et al. (2006)	US	National Longitudinal Survey of Youth 1979	Boosting cognitive and noncognitive skills	Simulations		Moving males in lowest decile of cognitive distribution from lowest to highest decile of noncognitive distribution substantially ↓ incarceration. Moving same males in lowest deciles of both distributions to highest decile of cognitive distribution only slightly ↓ incarceration.
Luallen (2006)	Washington State, US	Administrative Washington Juvenile Court Case Records 1980-2001, Census 2000 Summary File 3 and 1990 Summary Tape File 3, Public Employee Strikes in Washington 1967-2003, news articles from the Associated Press and the Seattle Times	School attendance	Teacher strikes		Youth crime ↑ 21.4% on days when strikes occur. In particular on such days, mischievous crime ↑ 48%, property crime ↑ 28.8% and violent crime ↓ 31.5%
Berthelon and Kruger (2011)	Chile	Chile's National Socio-economic Characterization Survey, CASEN since 1990; administrative data from the Defensoría Penal Pública, i.e., the Chilean equivalent of a Public Defender's office.	Length of the school day	School reform that lengthened the school day from half to full-day shifts		An increase of 20 pp in the municipal share of full-day high schools leads to a ↓ 3.3% in the probability of motherhood in adolescence and to a ↓ 11% to 24% in the juvenile crime rate.
Cook and Kang (2016)	North Carolina, US	Individual-level administrative data from the NC public school system (1987-93 birth cohorts); official-juvenile-complaint data and adult-felony-conviction data in NC from the NC Department of Juvenile	Delayed Entry Eligibility (DEE)			DEE leads to ↓ 31.8% criminality at age 13-15 and ↑ 14% serious criminality at age 17-19

		Justice and Delinquency Prevention and NC Department of Corrections				
Depew and Eren (2016)	Louisiana, US	Administrative records from the Louisiana Department of Education from 1997-2012; administrative data from the Louisiana Department of Public Safety and Corrections, Youth Services, Office of Juvenile Justice.	School entry age	Parametric fuzzy Regression Discontinuity (RD) Design	Null correlation for black females between timing of school entry and likelihood to commit a juvenile crime.	Birth after school entry cutoff leads black females to a ↓ 3 pp in risk of youth crime. IV estimates show that late school entry by one year leads black females to a ↓ 3.5 pp in risk of a youth crime.
Landersø et al. (2017)	Denmark	Danish register-based data for children born in mid-1981 to mid-1993.	Delayed Entry Eligibility (DEE)	Discontinuous minimum school-entry age		DEE leads to ↓ criminality at (by) all ages until age 19 (22) for boys and at (by) age 15 (19) for girls
Johnson and Jackson (2019)	US	Panel Study of Income Dynamics (PSID); National Archives Record Administration, Inter-university Consortium for Political and Social Research, and Surveillance, Epidemiology, and End Results population data.	Early childhood exposure to investments designed to promote school readiness among disadvantaged children	Head Start and K–12 spending		For poor children exposed to a 10% increase in K–12 spending, exposure to Head Start led to ↑ 0.59 additional years of education, ↑ 14.8 pp likely to graduate high school, ↑ 17% higher wages, ↓ 4.7pp likely to be incarcerated, and ↓ 12pp less likely to be poor adults
Anders et al. (2023)	North Carolina, US	Administrative conviction data from North Carolina's Department of Public Safety 1972-2018; Head Start and Smart Start funding information from the National Archives and Records Administration.	Early childhood education.	Rollout of Head Start and Smart Start.		Improvements to early childhood education led to ↑ 20% reductions in the likelihood of a serious criminal conviction in adulthood.
Garcıa et al. (2023)	US	Newly collected data on the original High Scope Perry Preschool Project participants through late / middle age and on their children into their mid-twenties.	Long-term benefits of early childhood intervention on disadvantaged children	High Scope Perry Preschool Project		The intervention led to lasting ↑ 0.2–0.4 standard deviation in the original participants' skills, ↑ 10 pp more likely to be married at age 30, ↑ $10,000 average annual earnings, ↓ 1 pp in criminality, and ↑ 15 pp healthier. Children of the original participants have ↑ 16.9 pp in likelihood of never being suspended and ↑ 25.8 pp in likelihood of employment, reduced criminality, and better health
Gray-Lobe et al. (2023)	Boston, US	All preschool applicants from fall 1997 to fall 2003 from the Boston Public Schools district; National Student Clearinghouse (NSC) data; administrative data from the	Public preschool attendance			Preschool enrollment leads to ↑ 18% in college attendance, ↑ 9 pp in SAT test-taking and ↑ 6 pp in high school graduation. Preschool also leads to ↑ 0.17 standard

	Massachusetts Department of Elementary and Secondary Education (DESE).	deviation in disciplinary measures including juvenile incarceration, but with no detectable impact on state achievement test scores.

Appendix Table A.3. Literature in Economics on the Link between Crime and Education, School Quality and Quantity

Study	Setting	Data	Treatment	Research Design	Correlation	Causal Impact
Gaviria and Raphael (2001)	US	National Education Longitudinal Survey (NELS) 1988-94.	Peer group influences.	IV estimates using average background characteristics as IV.	Drug use by parents correlated with ↑ probabilities of drug, alcohol, and tobacco consumption by their children by 19.4%, 13.2%, and 10.2%, respectively.	Drug use by parents correlated with ↑ probabilities of drug, alcohol, and tobacco consumption by their children by 19.4%, 13%, and 10.3%, respectively.
Cullen et al. (2006)	Chicago, US	Chicago public schools (CPS) administrative data on applications in spring 2000/01; achievement and attainment of CPS students, student survey on degree of satisfaction with school, students treatment by teachers and peers, college expectations, arrest.	High-achieving school attendance	Admission lottery into school		Lottery win to high-achieving school leads to nearly ↓ 60% self-reported arrest rates relative to lottery losers
Figlio (2006)	Florida, US	Administrative dataset on every disciplinary suspension, both in-school and out-of-school, during the four school years from 1996–97 through 1999–2000, i.e., following the introduction of the Florida Comprehensive Assessment Test (FCAT).	High stakes testing.	Interaction between the testing calendar, the grade level of the student, and the expected performance level of the student.		A one standard deviation increase in the test window manipulation measure is associated with a ↑ 1.2 pp in the likelihood that a student will attain level 2 or better on the FCAT reading exam and a ↑ 1.7 pp in the likelihood that a student will attain level 2 on the FCAT mathematics exam.
Deming (2011)	Charlotte-Mecklenburg, North Carolina, US	Administrative Charlotte-Mecklenburg school records for students in grades 6-11 in 2002 and age 17-23 in 2009; administrative records of adult arrests and incarcerations in Mecklenburg County (2006-209); NC Department of Corrections from 2006 on.	Better-achieving school attendance	Admission lottery into school		Lottery win to better-achieving school leads to roughly ↓ 50% criminality among high-risk youth relative to lottery losers
Billings et al. (2014)	Charlotte-Mecklenburg, North Carolina, US	Administrative Charlotte-Mecklenburg school records (1995-2011); administrative records of adult arrests and incarcerations in Mecklenburg County (1998-2011); National Student Clearinghouse records of college attendance.	School share minority	Discontinuous school boundary change		10 pp increase in assigned school share minority leads to ↑ 8% arrest and incarceration among minority males
Dobbie and Fryer (2015)	New York City, US	Survey data from youth entered in the 2005/06 Promise Academy sixth grade admissions lotteries in the Harlem Children's Zone; administrative data on	High-performing charter school attendance	Admission lottery into school		Lottery win to high-performing charter school leads to ↓ 10.1 pp teenage pregnancy and ↓ 4.4pp male incarceration

		high school test-taking from the New York City Department of Education and college enrolment data from the National Student Clearinghouse.				
Eren et al. (2017)	Louisiana, US	Administrative records of the Louisiana Department of Education (LDOE) from 1999-2012; Louisiana Department of Public Safety and Corrections, Youth Services, Office of Juvenile Justice.	Summer school and grade retention.	Regression discontinuity design to study test-based promotion policy.		Grade retention ↑ 3pp the propensity of a student to drop out of school.
Eriksson (2020)	US	Linked census data set of incarcerated and nonincarcerated men	Childhood access to primary schooling	School construction		Exposure to one new primary school built as part of the Rosenwald programme leads to ↓ 1.9 pp risk of incarceration.
Jackson et al (2020)	Chicago	Administrative data from Chicago public schools on 133 public high schools for cohorts of ninth grade students who attended one of these schools in 2011-17.	Attendance of schools with high socio – emotional development (SED) value added	Covariance of school value added across outcomes		Higher social value added leads to ↓ 0.728 pp risk of arrest; greater work hard value added leads to ↓ 0.766 pp risk of arrest; greater test score value added leads to ↓ 0.523 pp risk of arrest
McEachin (2020)	North Carolina, US	Administrative data of the North Carolina Department of Public Instruction for all students in North Carolina public schools in 2004-16; administrative data from the North Carolina Department of Public Safety and population-level records from the North Carolina Board of Elections	Charter school attendance	Doubly-robust inverse probability weighted approach		Compared with students who attended a traditional public school in both 8th and 9th grade, charter school entrants face ↓ 0.9 pp risk to commit any crime, and ↓ 0.7 and ↓ 0.4 pp risk to be convicted for a misdemeanour and felony off bases of 3, 0.2, 1.3 pp
Barrett et al. (2021)	Louisiana, US	Student-level data provided by the Louisiana Department of Education (LDOE) from 2000-14	Student discipline disparities by race and family income		Black (poor) students are ↑ 13 (9) pp more likely to be suspended in a given year than white (non-poor) students.	
Eren et al. (2022)	Louisiana, US	Administrative records of the Louisiana Department of Education (LDOE); Louisiana Department of Public Safety and Corrections, Adult Services, from 1996-2012.		Regression discontinuity design to study test-based promotion policy		Grade retention leads to ↑ 1.05pp in the likelihood of conviction by age 25.
Beuermann et al. (2023)	Trinidad and Tobago	Official administrative Secondary Entrance Assessment (SEA) data for all applicants to a public secondary school in Trinidad and Tobago from 1995-2012; data on the NCSE exams (age 14), the CSEC exams (age 16) and the CAPE exams; official arrests records from the Trinidad and Tobago Police Service; official birth records from	Whether schools' impact on test scores measure their overall impact on students	Exogenous school assignments		Schools' impacts on high-stakes tests are weakly related to impacts on arrests, dropout, teen motherhood, and formal labour market participation.

		the Trinidad and Tobago Registrar General; official registry of active contributors to the national retirement fund by May 2017 of National Insurance Board			
Billings and Hoekstra (2023)	Charlotte-Mecklenburg, North Carolina, US	Pupil records for Charlotte-Mecklenburg schools from 1998-2011; Mecklenburg County arrest records from 1998-2014; Mecklenburg County jail records from 1998-2014; North Carolina state prison records from 1998-2014.	School and neighborhood peers whose parents have been arrested	Cohort variation	A 5 pp increase in school peers linked to parental arrest leads to ↓ 0.016 standard deviation in school achievement and to ↑ 5% in adult arrest rates.
Huttunen et al. (2023)	Finland	Finnish joint application registry for cohorts who graduated from compulsory schooling from 1996-2003 and applied to further education immediately upon graduation; population-wide administrative registers from Statistics Finland from 1995–2013; the Finnish Longitudinal Employer-Employee Data (FLEED); Student Register and the Register of Completed Education and Degrees; Prosecutions, Sentences and Punishments based on the district court rulings.	Secondary education	Admission cut-offs in over-subscribed programmes to generate Regression Discontinuity (RD) designs	Admission of men to secondary schools leads to ↓ 52% risk of conviction in a district court within 10 years after admission compared with men who are not admitted.
Pope and Zuo (2023)	Los Angeles, US	Student-level administrative data from the Los Angeles Unified School District.	School suspension.	Changes in school suspension policies.	10 pp lower suspension rates lead to ↓ 0.040 standard deviation in math and ↓ 0.065 standard deviation in English test scores, ↓ 0.07 standard deviation in grade point averages and ↑ 15.1% absences.
Jackson et al (2024)	Chicago Public Schools (CPS)	Administrative data from CPS from 2012 to 2017 obtained from the UChicago Consortium on School Research. Survey measures of SED and National Student Clearinghouse (NSC)	Attending an effective high school	Comparison of end-of-year outcomes across schools while conditioning on lagged outcomes	For students in the bottom (top) decile of the distribution of educational advantage, attending a school at the 85th percentile of the effectiveness distribution vs one at the median is associated with a ↑ 3.8 (0.5) p.p. in high school graduation, a ↑ 3.6 (1.5) p.p. in college going, and a ↓ 2.1 (0.22) p.p. in risk of being arrested.
Liu, Hayes and Gershenson (2024)	California	Administrative data from a large urban school district in California for the 2016-17 through 2019-20 school years	Racial Disparities in Exclusionary Discipline	Incident Fixed Effects Strategy	Following fights between black and white students, black students are 2 pp (67%) more likely to be suspended than white students involved in the exact same incident.

Jordan et al (2024)	Chicago	Administrative data for elementary school students in Chicago Public Schools (CPS) between the 1995-96 and 2004-05 school years; census data from 1990 and 2000, as well as 5 American Community Survey (ACS) samples for 2008 to 2012; administrative data from the Clerk of Court for Cook County Il from 1984 to 2019 and the Illinois Department of Corrections (IDOC) data on prison admission records for 1990 through 2014.	Racial Differences in Academic Outcomes and Neighbourhood Quality during Childhood	Conditional on the set of Xs included, the unobserved characteristics of students that in influence future criminal justice outcomes are not correlated with their schools' value-added scores	Moving a Black, male, 8th grade student from a 10th to a 90th percentile school in the distribution of school effectiveness at promoting on-time matriculation from 8th to 9th grade leads to over ↓ 5 pp in future felony arraignment rates and to over ↓ 4 pp in future prison admission rates.
Bacher-Hicks et al (forthcoming)	Charlotte-Mecklenburg Schools (CMS), North Carolina (NC)	Administrative CMS school records (1998-2011); administrative records of adult arrests and incarcerations in Mecklenburg County (1998-2013); National Student Clearinghouse records of college attendance	School Suspensions	Discontinuous school boundary change, principal switches	1σ higher suspension effect leads to ↑ 17% arrest and to ↑ 20% incarceration
Baron et al (forthcoming)	Michigan	Administrative data from 1995 to 2004 academic years from the Michigan Department of Education (MDE), Michigan Center for Educational Performance and Information (CEPI), National Student Clearinghouse (NSC) and Michigan State Police (MSP)	Public school funding	Variation in operating expenditures due to Michigan 1994 school finance reform and to discontinuous outcomes of close school district capital bond elections	10% additional operating expenditure during elementary school leads to ↓ 15% in likelihood to be arrested in adulthood.
Benson et al (forthcoming)	US	National Child Abuse and Neglect Data System's Child File for the years 2003 to 2015	Time with teachers and in school	Regression discontinuity methods based on school-entry laws and on school calendars	Eligibility to enroll in kindergarten at age five leads to ↑ 5-10% in number of investigated reports for children aged five
Golberstein et al (forthcoming)	Minnesota	School-based mental health services adoption data set for the period 2001-2019; public agencies' administrative records linked together at the student level for the period 2001-2018; and the Minnesota Student Survey for the period 2001-2019.	School-based mental health services	Difference-in-differences design exploiting the staggered adoption of service	School-based mental health services do not seem to affect average standardised test scores but lead to an approx ↓ 10% in the risk of out-of-school suspension and to ↓ 25% in the risk of juvenile justice involvement.
Jackson (forthcoming)	Trinidad and Tobago	Administrative Secondary Entrance Assessment data for 2006–2012; linked administrative records of the National Certificate of Secondary Education and the Caribbean Secondary Education Certification; linked official arrest records between January 2000 and February 2015; and linked maternal data on all official birth records from the Registrar General's office from 2010 to September 1, 2016.	Single-Sex Education in Low-Performing Schools	Conversion of 20 low-performing secondary schools from coeducational to single-sex and discontinuous school assignment rules	The transition to single-sex leads to ↑ 0.2 % sd in academic achievement three years after secondary school entry, to ↓ 60% in risk of boys to be arrested by the age of 18 and to ↓ 40% in risk of girls to have a live birth by the age of 18.

Appendix Table A.4. Literature in Economics on the Impact of Crime on Education

Study	Setting	Data	Treatment	Research Design	Correlation	Causal Impact
Harlow (2003)	US	Survey of Inmates in State and Federal Correctional Facilities 1991 and 1997; Survey of Inmates in Local Jails 1989 and 1996; Survey of Adults on Probation 1995; Current Population Survey 1997; National Adult Literacy Survey 1992.	Education achievement of inmates.		Inmates' education links with ↓ youth sentencing, as roughly 40% without high school diploma, 45% with a GED, 26% with a high school diploma, 21% with some college had prior youth sentences either to a facility or probation.	
Hjalmarsson (2008)	US	National Longitudinal Survey of Youth 1979	Arrest, charge, conviction, incarceration at age 16 or younger.	OLS	Arrests lead to roughly ↓ 11 pp likelihood of graduation, and incarcerations lead to roughly ↓ 26 pp likelihood of graduation	When correcting for unobservables, incarcerations still lead to roughly ↓ 13 pp likelihood of graduation
Carrell and Hoekstra (2010)	Florida, US.	Confidential student-level panel dataset provided by the School Board of Alachua County in Florida on students in the third through fifth grades from 22 public elementary schools for the academic years 1995–1996 through 2002–2003; public records from the Alachua County Courthouse including the date filed and the names and addresses of individuals involved in domestic violence cases filed in civil court in Alachua County between January 1, 1993 and March 12, 2003.	Exposure to children from troubled families.	Family problems, as signalled by a request to the court for protection from domestic violence, used as exogenous source of variation in peer quality.		Adding one more troubled boy peer to a classroom of 20 students leads to a ↓ nearly 2 percentile points (one-fifteenth of a sd) in boys' test scores, and to a ↑ 40% in the number of disciplinary infractions committed by boys.
Aizer and Doyle (2015)	Chicago, US	Chicago Public Schools Student Database (1990–2006); Juvenile Court of Cook County Delinquency Database (1990–2006); Illinois Department of Corrections Adult Admissions and Exits Database (1993–2008).	Youth incarceration.		High school graduation ↓ 39 pp, adult incarceration ↑ 41 pp.	Youth incarceration leads to ↓ 13 pp high school graduation and ↑ 23 pp adult incarceration.
Brown and Velásquez (2017)	Mexico	INEGI monthly homicide reports at the municipal level and Mexican Family Life Survey.	Drug-related violence.	Surge in drug-related crime.		Increased local violence leads to ↓ 0.3 years of education, ↓ 8 pp likelihood of compulsory school completion, and ↑ likelihood of employment.

Carrell et al. (2018)	Florida, US	Administrative records from Alachua County (Florida) primary schools from 1995–1996 and 2002–2003 from the Florida Department of Education (FLDOE). Domestic violence cases filed in civil court in Alachua County between January 1, 1993 and March 12, 2003; National Student Clearinghouse (NSC) records from 2012.	Exposure to a disruptive peer in elementary school.	Variation in cohort composition across time within school.	Exposure to a disruptive peer in classes of 25 in elementary school leads to ↓ 3% earnings aged 24-28.
Bruck et al. (2019)	West Bank	MOEHE administrative records from 2000-06; Israeli NGO B'Tselem (Israeli Information Center for Human Rights in the Occupied Territories); Palestinian Labor Forces Surveys (PLFS) for the period 2000–06.	Effect of the Israeli–Palestinian conflict on education outcomes.	Within school variation in the number of conflict-related Palestinian fatalities in the academic year.	The conflict leads to ↓ probability of passing the final exam, ↓ in the total test score, and ↓ in the probability of being admitted to university.
Michaelsen and Salardi (2020)	Mexico	Ministry of Health (Secretaría de Salud) records of violence; ENLACE - Evaluación Nacional del Logro Académico en Centros Escolares - data on performance of primary school students on national standardized exams from 2006-11.	Exposure to violence.	Exogenous variation generated by "War on Drugs".	Exposure to at least three homicides within a 2km radius in the week immediately prior to exams leads to ↓ 0.1 in standard deviation of test scores.
Ang (2021)	Los Angeles, US	Incident-level data on the universe of officer-involved killings in LA County, California, from 2002-16; home addresses and individual-level panel data for all high school students enrolled in the LA Unified School District.	Police killings.	Granular variation in how close students live to a killing.	Exposure to police violence leads to ↓ 0.04 points in GPA, ↑ 15% incidence of emotional disturbance, ↓ 3.5% rates of high school completion and ↓ 2.5% college enrollment.
Eren and Mocan (2021)	Louisiana, US	Louisiana Department of Public Safety and Corrections, Youth Services, Office of Juvenile Justice from 1996-2012; Louisiana Department of Public Safety and Corrections, Adult Services from 1996-2012.	Impact of juvenile punishment on adult criminal recidivism and high school completion	Judge IV	Negative effect on high school completion for earlier cohorts, but no impact on later cohorts. Juvenile incarceration leads to ↑ 27 pp in the probability of adult conviction of a drug offense, null effect for violence.
Koppensteiner and Menezes (2021)	São Paulo, Brazil	Brazilian school census data collected by Instituto Nacional de Estudos e Pesquisas Educacionais Anísio Teixeira (INEP; National Institute for Educational Studies and Research "Anísio Teixeira") on behalf of the Brazilian Ministry of Education; Sistema de Avaliação de Rendimento Escolar do Estado de São Paulo (SARESP; the education evaluation system of the state of São Paulo); and individual attendance records in all state schools from the São	Effect of exposure to homicides around schools, students' residences, and on way to school.	Variation in homicides within a 25-meter radius around schools.	Violence leads to ↓ 5% standard deviation test scores and to ↑ 20% dropout rates.

		Paulo State Secretariat of Education; Brazilian Ministry of Health records.			
Arteaga (2023)	Colombia	Colombia's census of potential beneficiaries of welfare (SISBEN); Attorney General's Office records; internet records scraped by the author.	Parental incarceration.	Judge IV.	Parental incarceration leads to ↑ 0.78 years in educational attainment for children of convicted parents.
Padilla-Romo and Peluffo (2023)	Mexico	ENLACE (National Assessment of Academic Achievement in Schools) data from 2005-13; INEGI (National Institute of Statistics and Geography of Mexico) data; CONAPO (National Population Council) data.	Out-migration from violence-affected areas and peer exposure to violence.	Mexican war on drugs.	Adding a new peer who was exposed to local violence to a class of 20 students leads to ↓ 2% standard deviation in incumbents' academic performance.
González and Prem (2024)	Chile	Administrative records of 300,000 students enrolled in more than 2,000 schools in the city capital in 2011. Media outlets such as La Tercera and El Mercurio	Police violence	Schoolmates of victim of police killing and distance from shooting	Police killings lead to ↓ 7 pp in the probability that the schoolmates of the victim skip school in protest days, to ↑ 13 pp in the likelihood to participate in the student-led boycott and to ↓ 29 pp in the chance of taking exam to access higher education.
Sarzosa (2024)	South Korea	Longitudinal data on a cohort of South Korean students	Bullying victimization	Exogenous assignment of classmates	Victimization leads to ↓ 40% sd in current skill levels for the average child, and this skill depletion leads to ↑ 34% in likelihood to experience bullying again.
Levine and McKnight (forthcoming)	Columbine High School (Littleton, CO), Sandy Hook Elementary (Newtown, CT), and Marjorie Stoneman Douglas High School (Parkland, FL)	Data from the Stanford Education Data Archive for school years from 2008/2009 to 2017/2018; linked data from the National Assessment of Educational Progress; publicly-reported school-level data on test scores available from the state of Connecticut from 2007/2008 and 2017/2018; publicly reported school-level end-of-course assessment data from the state of Florida; Vital Statistics Multiple Cause-of-Death Mortality data from Colorado between 1990 and 2017.	High-fatality school shootings	Difference-in-differences methods	High-fatality school shooting at Sandy Hook (Parkland) lead to ↓ 0.10 sd in math test scores (↓ 0.37 sd in US history) and ↓ 0.13 sd in ELA test scores (↓ 0.51 sd in in geometry) in grades 3-8; to ↓ 0.22 sd in math test scores and ↓ 0.13 sd in ELA test scores in grades 3-4; and to ↑ 1.9 pp in risk of chronic absenteeism. The Columbine shooting lead to ↑ 7.8 suicides and ↑ 7.5 accidental deaths among male survivors by age 29.

Appendix Table A.5. Literature in Economics on the Link Between Crime and Education, Miscellaneous Policy Interventions

Study	Setting	Data	Treatment	Research Design	Correlation	Causal Impact
Sabates and Feinstein (2008)	England and Wales	Home Office Offenders Index database (OI) records of criminal convictions in England and Wales for 1996-2002 samples.	UK government initiatives: Reducing Burglary Initiative; and Educational Maintenance Allowance.	OLS with difference in differences design.		Areas that introduced both programmes faced ↓ 1.1 - 1.5 convictions for youth aged 16-18 years old for burglary per 1000 relative to areas where neither programme was introduced.
Blattman et al. (2017)	Liberia	Survey data collected for the evaluation of the intervention.	Cognitive behavioural therapy to foster self-regulation, patience, noncriminal identity, lifestyle, and $200 grants.	Randomized allocation of treatment.		Cash after therapy led to ↓ 0.31 standard deviation antisocial behaviour for over a year.
Heller et al. (2017)	Chicago, US	Longitudinal student-level CPS records, Illinois State Police (ISP) records and arrest data from the Chicago Police Department (CPD).	Becoming A Man (BAM) programme.	Set of randomized controlled trials (RCTs).		The BAM programme reduced total arrests during the intervention by 28–35%, reduced violent-crime arrests by 45–50%, raised school engagement and graduation rates by 12–19%.
Owens (2017)	US	National Incident Based Reporting System (NIBRS) from 1997-2007; COPS office from 1994-2007; Uniform Crime Reports Law Enforcement Officers Killed and Assaulted (LEOKA); Law Enforcement Management and Administrative Statistics (LEMAS).	Use of sworn School Resource Officers (SROs).	Federal hiring grant to place law enforcement in school.		The average grant is linked with ↓ 1.1-1.9% disruptive criminal incidents in school.
Anderson and Sabia (2018)	US	Youth Risk Behavior Surveys (YRBS) from 1993-2013.	Youth gun carrying and mass shootings.	Child access prevention (CAP) gun controls laws.		CAP laws lead to a ↓ 13% in the rate of past month gun carrying and a ↓ 18% in the rate at which students report being threatened or injured with a weapon in school.
Weisburst (2019)	Texas, US	Texas Education Research Center (ERC) records, Texas Education Agency (TEA) records and Texas Higher Education Coordinating Board (THECB).	Funding for school police on student outcomes.	Federal Community Oriented Policing Services (COPS) grants		Federal grants for police in schools lead to ↑ 6% middle school discipline rates, ↓ 2.5% in high school graduation rates and ↓ 4% in college enrolment rate
Gulesci et al. (2021)	Bolivia	Data collected for the purpose of the evaluation of this intervention.	Impact of a youth empowerment			The youth empowerment programme led to ↓ 10pp in the

			programme on the reported prevalence of violence against girls.		reported prevalence of violence against girls during the COVID-19 lockdown.
Heller (2022)	Chicago, Philadelphia, US	Chicago and Philadelphia administrative police records of arrests; in Philadelphia, service records from the City's integrated data system, known as CARES, to measure juvenile incarceration (including both detention and prison) and related court ordered services.	Summer youth employment programmes (SYEP).	Admission lotteries.	In Philadelphia [Chicago], being offered the programme leads to ↓ 1 [9] arrest per 100 youth (i.e., 36%) [i.e., 52%]. Due to the size of first stage, the effect on compliers in Philadelphia is ↓ 3 arrests per 100 youth (i.e., 65%).
Rees et al. (2022)	US	Youth Risk Behavior Surveys (YRBS) data from 2009-17; National Vital Statistics System (NVSS) from 1993-2016	Bullying victimization.	State-level anti-bullying laws (ABLs).	State-level anti-bullying laws (ABLs) lead to ↓ 2.6 pp in bullying victimization, ↓ 1.9 pp in depression, and ↓ 1.7 pp in suicidal ideation.
Foged et al. (2023)	Denmark	Administrative records on demographics and school and crime records of youth born in 1990 to 2001, still in Denmark at age 18, and with at least one parent granted asylum in Denmark within four years around 1st January 1999.	Parental language training for refugees	Reform to expand language training for adult refugees	Parental language training of refugees leads to ↓ 72.7% convictions and ↓ 80.8% charges of male children aged 15-18
Sorensen et al. (2023)	US	2013/2014 and 2017/2018 waves of the CRDC from all public schools in the US, except preschools and schools with <25 students; Freedom of Information Act (FOIA) request to the U.S. Department of Justice COPS office.	School resource officers (SROs)	Fuzzy regression discontinuity design	SROs lead to ↓ 30% in violence in schools, but do not prevent gun-related incidents.
Sviatschi and Trako (2024)	Peru	Microdata from the Peruvian Demographic and Health Survey (DHS) for the period 2000-2014. Peruvian School Census (Censo Escolar, CE) for the period 1998-2014 and the Census Evaluation of Students (Evaluacion Censal de Estudiantes, ECE) for the period 2007–2014. Information on the rollout of the programme provided by the Peruvian Ministry for Women and Vulnerable Populations. Crime records in the Police Reporting System of the National Police of Peru (Sistema Informático de Denuncias Policiales, SIDPOL) and the National Registry of Complaints of Crimes and Misdemeanors of the INEI (Registro	Opening of Women's Justice Centres	Graduate rollout across districts and villages	The opening of a centre leads to ↓ 10% in the incidence of gender-based violence, to ↑ 2.8% in number of children enrolled in primary school and to ↑ 0.02-0.05 sd in student test scores.

		Nacional de Delitos en las Dependencias Policiales).			
Arbour et al (forthcoming)	Canada	Administrative records from the Administrative Correctional Files of the Province of Quebec Ministry of Public Security	Prison Rehabilitation Programmes	Exogenous variation in programme availability	A 1 sd increase in availability of prison rehabilitation programmes leads to ↓ 4 pp in risk of reincarceration over a five-year window and to ↑ 2pp in risk of a community sentence
Dustmann et al (forthcoming)	Denmark	Data from administrative registers of all refugees who receive residency in Denmark for the period 2001 to 2003. Administrative records on income from tax authorities, labor market outcomes, crime from police and court records, and education from the Ministry of Education.	Disposable Income	RD design that compares children and families exposed vs not exposed to large welfare benefit reduction	Welfare cuts by 40% on average in preschool and school-age lead to ↓ 0.18% sd in 9th-grade GPAs, to ↓ 0.6 years in completed education and to a doubling in the risk of conviction probabilities for violent and property crimes in teenage years.

Appendix Table A.6. Literature in Economics on the Link Between Crime and Education, Miscellaneous Studies

Study	Setting	Data	Treatment	Research Design	Correlation	Causal Impact
Merlo & Wolpin (2009)	US	NLSY97 on black male youths starting from age 14	Schooling	Multinomial discrete choice vector autoregression (VAR)	Not attending school linked with ↑ 12.4 pp risk of incarceration	Not attending school leads to ↑ 3.2 pp risk of incarceration, averaged over the estimated distribution of initial conditions
Weiner et al (2009)	US school districts that in 1968 were 20-90% minority with enrolment of 50000+, and random pool of districts which were 10-90% minority with enrolment of 15,000 - 50,000	Vital Statistics (VS) and the FBI's Supplemental Homicide Reports (SHR) at the county level; FBI's Uniform Crime Reports; Census Bureau and VS interpolations for intercensal years	School desegregation	Exogenous variation in time and across school districts in court-ordered school desegregation		For school-age blacks, homicide victimization ↓ by roughly 25% when court orders are implemented; homicide arrests ↓ too by a similar magnitude
Meghir et al (2012)	Sweden	Sweden's population census on the parent generation of all individuals born in Sweden in 1945-55 and their children; Sweden's Education Register; Swedish National Council for Crime Prevention records since 1973.	Parental Educational attainment	Reduced form analysis model in a difference in difference specification		Paternal exposure to MDA reform leads to ↓ a 0.8 pp (↓ 3%) crime participation, while estimates for women are not statistically significant.
Baron et al (2020)	Florida	Florida Department of Children and Families (DCF) from January 2004 to April 2020	COVID-19 school closures			Covid-19 school closures, and more generally the Covid-19 pandemic, led to a ↓ 27% number of maltreatment allegations
Rose et al (2022)	NC public schools	Administrative records from the NC Education Research Data Center for all students in public schools from 1996-2013; administrative data on arrests, charges, sentencing from the NC Administrative Office of the Courts	Teacher quality	Empirical Bayes-free (EB-free) estimators of the variance of teachers' effects on students' future arrest, conviction, incarceration; non-parametric estimators of variance-covariance structure of teacher effects		A one σ increase in teacher effects leads to ↑ risk of future criminal arrest, arrests for index crimes, and incarceration by 0.027, 0.018, 0.021 pp, respectively, or 11.25%, 18%, 23.6% of the outcome mean
Baran et al (forthcoming)	US	1940 census	Place	First Great Migration and comparison of outcomes for movers		Moving to the average Northern destination rather than the average Southern destination lead to ↑ 12% in educational attainment