The Legacy of School Shootings: The Long-Term and Intergenerational Effects*

Hazal Sezer†

Abstract

In recent decades, countless US students have been on school grounds during shootings. This paper examines the long-term and intergenerational effects of school shootings on earnings, educational attainment, and geographic mobility. I find that exposure to a school shooting decreases survivors' hourly wage by 20.8% and that this effect persists over their lifetime. Furthermore, I show that the effect of school shootings lasts beyond the initially exposed and has a detrimental impact on their children. Having shooting-exposed parents decreases children's hourly wages by 18.8%.

Keywords: school shootings, wages, intergenerational mobility
JEL Codes: I31, J24, J31, J62, K42

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†Department of Economics, Tilburg University. Email: a.h.sezer@tilburguniversity.edu

1 Introduction

School shootings are a devastating problem in the United States. Over the past 50 years, countless students have been on school grounds during a shooting, and more than 600 schools have experienced a shooting. The official number of fatalities is over 1,200, but the true impact of these events goes beyond the casualties. As the chief of the St. Louis Police Department noted after a shooting at St. Louis High School in Missouri, "While on paper we might have nine victims, we have hundreds of others. Everyone who survived today is going to take home trauma."[1]

Much like other traumatic events, school shootings have far-reaching consequences for the survivors. This paper is the first to investigate the long-term and intergenerational effects of school shootings on earnings, educational attainment, and geographic mobility. I first show that school shootings have detrimental effects on survivors, using US-wide data from the Panel Study of Income Dynamics between 1970 and 2007 combined with school-shooting data from the K-12 School Shootings Database.

To do so, I use a difference-in-differences framework, comparing the average change over time in the outcomes for those in school districts with a shooting to the average change over time for those in neighboring districts. The treatment group includes individuals of school age in a shooting district during a shooting incident. The control group includes individuals from the shooting districts who were too old to have been exposed during the shooting. It also comprises individuals from neighboring districts that fall into the same two age categories: those exposed and those too old for exposure. My baseline results show that individuals who are exposed to a shooting incident have 20.8% lower hourly earnings at age 30.[2] These findings are robust to an extensive set of checks. Further investigation indicates that lower hourly earnings persist over the survivors' lives and that survivors never catch up

[1] https://web.archive.org/web/20221116003103/https://www.campussafetymagazine.com/safety/2-killed-in-st-louis-high-school-shooting/

[2] A 20.8% drop in hourly earnings equals \$2 less per hour, leading to a $\$101,950$ lifetime earnings decrease for shooting-exposed individuals.

with non-exposed individuals.[3]

Next, I present evidence suggesting that decreased educational attainment, labor market participation, and geographic mobility explain a large part of the lower hourly earnings of survivors. First, I find a strong adverse effect of school shootings on educational outcomes. On average, survivors receive four months less education, are 7% less likely to graduate from high school, and are 20% less likely to earn a college degree. Second, I find detrimental effects of shootings on labor market outcomes on both the intensive and extensive margins. A survivor works on average 5% less hours (conditional on employment) and is 30% more likely to be unemployed or out of the labor force at age 30. Third, I investigate the effects of school shootings on geographic mobility. My findings suggest that survivors are less likely to move out of the locations of the shootings, potentially diminishing their chances for increased economic potential. I also examine school-district spending as a potential mechanism.[4] I find no statistically significant impact on per-pupil education spending and, therefore, conclude that changes to school districts' fiscal priorities are unlikely to explain the results. I assess each mechanism's contribution to lowering earnings using the results from Psacharopoulos and Patrinos (2018) and Chyn (2018). I find that the educational-attainment and geographic-mobility mechanisms explain a significant fraction of the lower earnings.[5]

The intergenerational impacts of shootings on educational and labor market outcomes remain unexamined. To fill this gap, I investigate the effect of school shootings on the children of the exposed. Using a similar difference-in-differences framework, I find that school shootings bring an 18.8% decrease in the earnings of children of shooting-exposed parents. Again, I demonstrate that educational attainment and geographic mobility likely statistically explain a large part of the lower earnings of such children. Children of exposed

[3]For instance, at 25, exposed individuals earn $1 less per hour; at 45, $3.5 less.

[4]There are several components of per-pupil school-district spending: total spending, education and instruction, support services, and salaries. Jackson et al. (2016) show that an increase in per-pupil *education* spending leads to higher wages in adulthood.

[5]More specifically, years of schooling completed explains one-eighth, college completion a quarter, and geographic mobility one-tenth of the lower earnings.

parents, on average, receive six months less education than children of parents that were not exposed and are 20% less likely to graduate from high school. Furthermore, children of shooting-exposed parents are less likely to move to a better neighborhood, limiting their future economic opportunities. Given that the effects of neighborhood exposure are most pronounced during one's formative years, it seems that the geographic-mobility mechanism's contribution to lower earnings is larger for the children of exposed parents than the initially exposed. Indeed, benchmarking to Chetty and Hendren (2018a), I find that geographic mobility explains about a fifth of the decrease in the hourly earnings of children of shooting-exposed parents.

This paper is the first to delve into the indirect effects of school shootings on a second generation influenced by their parents. Notably, it unveils that a parent's exposure to a school shooting reverberates through more than just a child's future earnings and educational accomplishments; its ripple effects permeate their childhood. Children born to parents exposed to such traumas often harbor a diminished perception of their mathematical abilities in comparison to their peers. Further, these children tend to have lower self-worth than other children. These findings suggest that these children not only set lower educational goals and expectations but also engage in fewer conversations about the future with their parents and friends compared to other children.

I contribute to several strands of economic literature by offering the first exploration of the long-term and intergenerational consequences of school shootings. First, I build on the literature on school shootings, which includes studies on their effects on educational outcomes (Poutvaara and Ropponen, 2010; Beland and Kim, 2016) as well as their implications on human capital and economic outcomes up to age 25 (Cabral et al., 2021) and health outcomes (Deb and Gangaram, 2021). My work substantially advances this literature by using a sample spanning the entire US over four decades, investigating the effect on wages over survivors' lives, exploring why the shootings lower earnings, and examining the consequences of lower wages on the survivors. Furthermore, is the first paper to explore the connection between neighborhood effects and school shootings by underscoring how restricted geographic mobility amplifies

their effects. Additionally, it is the first to investigate the causal impacts of school shootings on the next generation.

The findings of this study also contribute to the literature on neighborhood effects and intergenerational mobility. Chetty et al. (2014a), Chetty et al. (2014b), and Chetty and Hendren (2018b) demonstrate the effects of residential segregation, income inequality, and neighborhoods on earnings and mobility of individuals. Chetty and Hendren (2018a) show significant neighborhood exposure effects on intergenerational mobility. Specifically, the adult incomes of children who moved to better neighborhoods converge to the adult incomes of children of permanent residents at the destination location at a rate of 4% per year of childhood exposure. Other recent papers have confirmed these findings in different countries (Deutscher, 2020; Laliberté, 2021). This strand of research shows that geography plays an important role in educational attainment and adult economic outcomes of children. I contribute to this literature by showing that exposure to shootings or having shooting-exposed parents reduces one's geographic mobility. This limited mobility may restrict access to superior job opportunities and education, creating poverty traps that exacerbate human capital loss and ensnare affected individuals and their descendants in cycles of socio-economic disadvantage.

Furthermore, by considering school shootings as a determinant of earnings and career choices, this study advances the large literature on the factors that determine individuals' earnings (Hoekstra, 2009; Wiswall and Zafar, 2015; Biasi et al., 2021; Patnaik et al., 2020). Specifically, I find that survivors are less likely to choose careers that commonly require a college degree. Finally, my analysis also relates to the literature on the long-run effects of violence on individual mental health (Ang, 2021; Bharadwaj et al., 2021; Doyle Jr and Aizer, 2018; Sharkey, 2010; Travers et al., 2018). This paper is the first to study the effects of school shootings on child development of the second generation affected by shootings and among the first to look at the long-term mental health effects of school shootings on the surviving generation.

2 Data

My research is the first to delve into the long-term and intergenerational consequences of school shootings. I utilize a unique dataset combining US-wide data from the Panel Study of Income Dynamics (PSID) with data from the K-12 School Shootings Database. Furthermore, the Child Development Supplement from the PSID offers data on child aspirations and school expectations, enabling an extended analysis encompassing second-generation effects.

2.1 School Shootings

I use the Center for Homeland Defense and Security's K-12 school-shooting database. This comprehensive database covers over 1,500 gun-related incidents in K-12 education in the US. It compiles and cross-references all existing data on shootings through an independent review of associated sources.[6] The cross-referenced data are investigated to account for discrepancies in such information as school name, location, date, and number of victims. The database includes every gun-related incident from 1970 to the present and is continually updated as new incidents occur.[7]

I use data on school shootings from 1970 to 2007.[8] As I am interested in studying the effects of exposure to shootings on student outcomes, I limit the data to the shootings that occurred on a weekday, during school hours, and on school grounds.[9] An examination of the geographic distribution of school shootings in the US is provided in Online Appendix Figure A1. The map illustrates that school shootings are not concentrated in any geographic region but rather occur across the country. The temporal characteristics of

[6]The US Secret Service, FBI, Department of Education, the Washington Post, CNN, the Gun Violence Archive, Everytown for Gun Safety, Education Weekly, Mother Jones, Angels of Columbine, Wikipedia, SchoolShootingDatabase.com, and SchoolShootingTracker.com.

[7]The database records incidents of firearms' being fired and incidents of bullets' striking school property, regardless of the number of victims, time, or day of the week.

[8]I only use the data until 2007 because an individual in the data set who is exposed at age 18 will reach age 29 (the lowest age at which I measure the outcome variables) by 2017, which is the last wave of the Panel Study of Income Dynamics that I use in my analysis.

[9]Where multiple shootings happen in any school district within the same year, I consider them to be one event and aggregate the casualties.

the number of incidents and deaths per year during the analysis period are depicted in Online Appendix Figure A2. The data presented in the time-series plot illustrate that the highest frequency of incidents and the highest number of casualties were observed during the 1990s.

2.2 Longitudinal Individual Data

I use the public and restricted data set from the PSID, produced and distributed by the Institute for Social Research's Survey Research Center at the University of Michigan (2020). The PSID tracks individuals and their families, including spouses and children, even when they leave their original household and start a new family unit. The longest-running longitudinal household survey globally, the PSID began in 1968 with a nationally representative sample of American individuals and families and currently has information on more than 75,000 individuals.[10] After the initial 1968 interview, families and individuals were interviewed annually until 1997. After 1997, the survey was conducted every other year.

The PSID collects data on family- and individual-level variables such as employment, income, wealth, expenditures, health, marriage, education, and geospatial identifiers. Many of the outcome variables studied in this paper come from the PSID: labor income, business income, hours worked, employment, years of education, occupation, and house value. Additionally, the PSID includes predetermined individual-level variables that I use as controls in the regression analysis, such as the gender and race of the respondent, educational achievements of the respondent's parents, employment details of the respondent's father, income of the respondent's parents during the respon-

[10]The PSID sample remains representative of the national sample of American individuals and families (Fitzgerald et al., 1998). In the PSID data, I identified 1,214 individuals (approximately 1.6% of the 75,000 sample) exposed to shootings, contrasting with the Washington Post's report of over 357,000 students experiencing gun violence since Columbine. The Bureau of the Census' October 2023 report indicates about 50 million students were enrolled in U.S. schools in 2022, meaning the Post's 20+ year data suggests a 0.7% exposure rate. Significantly, this analysis includes district-wide exposure. Moreover, it reveals that shootings were more frequent before the Post's analysis period, suggesting that this paper likely underestimates the actual percentage of students exposed to shootings.

dent's childhood, and marital status of the respondent's mother at the time of the respondent's birth.

I use individual- and family-level variables provided by the PSID to create additional outcome variables for an individual. Hourly earnings are calculated annually as the ratio of total earnings to hours worked.[11] High school– and college-degree dummy variables are derived from years of education. Unemployment and self-employment are obtained from the employment variable of the PSID and are both dummy variables. I construct these variables for each observation between the ages of 29 and 31 by selecting the first available value.[12] Following a similar specification to Jackson et al. (2016), I choose the age around 30, as most individuals have completed education by this age.

I obtain geospatial information from the PSID at the census-block level. There are over 7 million census blocks in the US, and a block contains, on average, 600 people. I use the geographic coordinates that link individuals to their census block during childhood and match their residential locations to the school-district boundaries when they attended K-12 education. After merging this with the school-shootings data, I can identify school-age individuals in the shooting and neighboring school districts at the time of the shooting.

2.3 Supplementary Data

I compiled data on school-district spending and revenue from the Common Core of Data and the Historical Database on Individual Government Finances to understand whether school-district finances mediate the main outcome variable, hourly earnings. For this analysis, I use control variables at the school-district level: population, median household income, per capita income, number of people living in poverty, and other demographic variables such as race, sex, and age profiles from the decennial census. Online Appendix B provides a detailed description of these data sets.

[11] A description of how these variables are created can be found in Online Appendix C.

[12] I use age bins from 29 to 31 to maximize observations, given the PSID's biennial frequency post-1997. In Online Appendix Table A1, I analyze average hourly earnings for these ages and find results aligning with the main findings.

3 Empirical Strategy

3.1 Difference-in-Differences Approach

I estimate the effects of school shootings on earnings, education outcomes, income and geographic mobility, career choice, and the intergenerational transmission of these effects. To do so, I exploit variation in the geographic and temporal distribution of school shootings. Unless otherwise specified, for each outcome variable, I estimate regression equations of the following form:

$$y_{id,t+30} = \beta Exposed_{id,t+\tau} + \boldsymbol{X}_i'\gamma + \alpha_d + \delta_t + \varepsilon_{id,t+30} \tag{1}$$

where $y_{id,t+30}$ is the outcome variable for individual i born in year t and who went to school district d. The dummy variable $Exposed_{id,t+\tau}$ defines exposure to shootings, where τ is individual i's age of exposure. X_i are predetermined control variables for individual i such as race and gender of the respondent, parental income of the respondent when growing up, educational achievements of the respondent's mother and father, employment details of the respondent's father, marital status of the respondent's mother at birth, and time since exposure to the shooting.[13]

The inclusion of time since exposure aims to account for individuals' varied duration in exposed schools. Since earnings are measured at age 30, this captures the age at which they experienced the shooting. To effectively assist impacted individuals, pinpointing the age at which such events are most damaging becomes vital. However, since most shootings occur in high schools, discerning the specific effects of elementary school shootings remains challenging. Consequently, I incorporate time since exposure to account for individuals spending more extended time in an exposed school.[14]

[13]The parental control variables are selected from the first available year preceding the shooting. In some analyses, outcome variables measured at different times are used. Unless otherwise specified, the variable is calculated for $t + 30$. To account for changes in school-district boundaries and IDs over time, a crosswalk linking block, tract, county, and state to districts is created for each year and merged with the PSID data. To obtain a single ID for each district, the crosswalks from each year are merged with the 2010 crosswalk.

[14]Time since exposure is coded positively for individuals exposed to school shootings and

To partial out the effects of time-invariant and aggregate trends, I use school-district and birth-year fixed effects, respectively—α_d, and δ_t in equation (1).[15] To account for correlation in the error term between observations, I cluster standard errors at the school-district level. The parameter of interest is β, which represents the estimated effect of exposure to a school shooting.

3.2 Exposure

I define an individual as *exposed* if they were at the relevant school age in a shooting district at the time of the shooting. For instance, consider the Columbine High School massacre in 1999, which resulted in 13 deaths and 24 injured. In this example, portrayed in Figure 1, an individual would be defined as *exposed* if they were between ages 14 and 18 and going to school in Columbine's district—Jefferson County School District R-1 in Colorado—in 1999. Meanwhile, *pre-exposed* is defined as an individual who is too old to be exposed at the time of the shooting. For example, an individual would be defined as *pre-exposed* if they were 19 or older and residing in Jefferson County School District R-1 (see Figure 1) at the time of the Columbine massacre.

For control groups, I use data from the individuals of the same age as the exposed and pre-exposed in a district neighboring the shooting-exposed school district. From the set of neighboring districts, I omit those that themselves had a shooting at a different time.[16] Furthermore, I only include the neighbors within the same state to account for variation in firearm laws.[17] Figure 1 shows the neighboring districts of Jefferson County School District R-1 that are included in the analysis. The control groups are 14- to 18-year-old students and individuals who were 19 and older in the neighboring districts in 1999.

I determine exposure based on residency, given that enrollment in a public

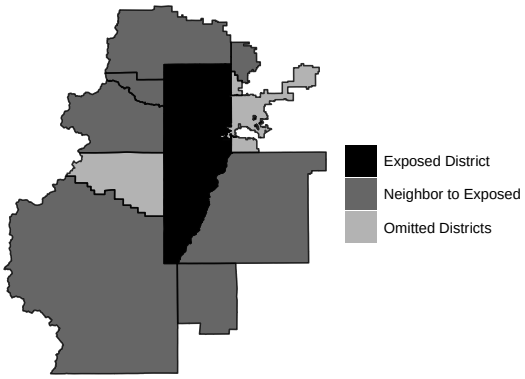
negatively for those too old to have been exposed.

[15]The National Center for Education Statistics' district identifiers used in the analysis are from 2010. Individual fixed effects are not included, as the outcome variables are not observed before exposure and, therefore, exposure never varies within an individual.

[16]Furthermore, I omit the neighboring districts that experienced shootings outside of school property or after school hours or on a weekend. Districts neighboring more than one shooting district are omitted from the control group.

[17]The largest variation in gun laws arises from state-level legislation (Siegel et al., 2017).

Figure 1. Jefferson County School District R-1 and Neighbors



Note: The exposed district, Jefferson County School District R-1, is shown in black. Neighboring districts included in the analysis are shown in dark gray. The rest of the neighboring districts (shown in light gray) are omitted from the analysis since they later experienced a shooting themselves.

school is typically dictated by one's residential district, leading students to predominantly attend the nearest school. Still, the school choice of some students within the district is not identifiable based on their residential address. Some states allow flexibility in school choice within the district, while inter-district transfers are heavily regulated and only allowed in exceptional cases, potentially bringing added tuition fees.

Research from other disciplines (i.e., criminology and sociology) indicates that the effects of school shootings reach beyond the directly affected school (Orcutt et al., 2014). This widespread effect is facilitated by regular interactions among students across the district through multischool busing, extracurricular activities, and athletic competitions, leading to a district-wide increase in anxiety and fear of victimization (Cook, 2020).[18] The Online Ap-

[18]The findings of Online Appendix Table A2 indicate that the interaction between exposure to school shootings and the land area of the school district does not have a significant effect on hourly earnings. This suggests that the impact of such incidents is similar across school districts of varying sizes. Additionally, the results are consistent with prior research, notably the significant study by Cabral et al. (2021), that examine the effects of school shootings at the school level. The event-study plot in Online Appendix Figure A8 further supports this conclusion, as it shows that the negative impact of school shootings on hourly earnings is statistically significant and comparable across districts with varying numbers of schools. Additionally, the Online Appendix Table A3 displays coefficient estimates detailing the impact of school shootings on hourly earnings across urban, suburban, and rural

pendix Figure A8 supports defining the treatment at the school-district level, demonstrating that the effect of shootings on hourly earnings remains similar, regardless of the number of schools in a district.

Moreover, the impact of a school shooting is unlikely to extend to neighboring districts, largely due to the limited interactions between students from different districts. Students typically engage more within their own district, influenced by geographical separation, distinct school bus routes, and school-specific activities and sports leagues (Cook, 2020). Additionally, the strong sense of identity and cohesion with their own school and district can create a psychological boundary. Differences in school policies, cultures, and parental and community influences further reinforce these district-centric social networks (Foreman et al., 2016). While administrative boundaries between districts dictate not only school attendance but also focus school programs and resources within their own borders, limiting the likelihood of emotional and social connections with students from neighboring districts.

3.3 Identifying Assumption

The necessary assumption to obtain causal effects of school shootings on students is that absent a shooting, the educational-achievement, labor market, and other outcomes would have developed similarly between exposed and neighboring districts. Thus, nothing jointly determines exposure to the shooting and outcomes, conditional on fixed effects and controls.

The estimation results would be biased if the occurrence of a shooting was correlated with a (potentially unobserved) variable that also influenced the outcome variables. Suppose a shooter deliberately committed their act in a district with deteriorating economic conditions. In that case, these conditions might independently lead to lower wages for the district's residents in the future. To understand the potential differences between school districts, I compare the district characteristics of exposed and neighboring districts before the shooting. Online Appendix Table A4 presents the mean of school-district

districts. The effects are statistically significant at the 1%, 10%, and 5% levels respectively, all suggesting a negative impact.

characteristics for shooting, neighboring, and all districts prior to shootings. Shooting and neighboring districts vary along some dimensions: shooting districts have a lower share of white residents, more individuals with low parental income, and fewer individuals with college-educated fathers. They vary, however, along substantially fewer dimensions than the universe of all school districts. And the variation is only a concern if it causes a differential response in the outcome variable. Nevertheless, I control for these observables.

The identifying assumption requires the outcomes to have evolved similarly in the absence of shootings between treated and neighboring districts. To investigate this requirement, I estimate an event study in which I regress hourly earnings on exposed district for a subsample of ages. As one can see from Figure 2, the difference in hourly earnings between exposed and non-exposed districts is not statistically significant for pre-shooting cohorts (shown on the right in light gray).[19] Furthermore, in addition to being imprecise, the estimates are sometimes positive and sometimes negative for the pre-shooting period, thus not giving a clear tendency; however, they are negative and statistically significant for 10 to 18-year-olds. This result indicates that the estimates are not due to pre-treatment divergence in trends.[20]

In Section 4.2, I execute further checks to mitigate any lingering concerns regarding the differences in school-district characteristics. These analyses ensure the findings are not driven by prior trend differences.

4 The Effect of School Shootings on the Exposed

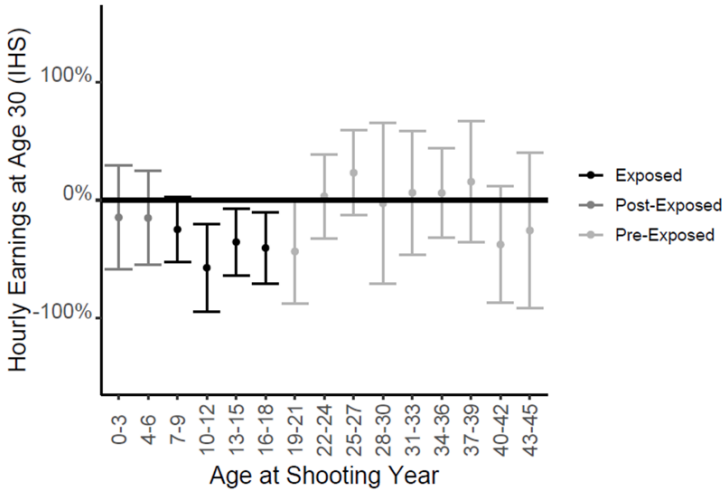
4.1 Results

The results of estimating equation (1) are displayed in Table 1, with each column representing a separate regression with a different set of fixed effects

[19] Although not statistically significant, the results for age group 19–21 show a negative effect. To alleviate concerns about grade repeaters and their treatment status, this age group is omitted from the main analysis. The coefficients presented in the Online Appendix Table A5 are statistically significant at the 1% level and comparable to those in Table 1.

[20] Online Appendix Figure A5 shows an event-study plot analogous to Figure 2 but with years of completed education as the outcome variable. It confirms the inference of Figure 2.

Figure 2. The Effect of School Shootings on the Hourly Earnings of Different Age Groups



Note: The figure shows the hourly earnings of individuals exposed to school shootings in different age bins. Each point reports the coefficients and confidence intervals from separate regressions following the estimation strategy shown in equation (1). The outcome variable is the inverse hyperbolic sine transformation of the hourly earnings of an individual at age 30. Individuals in the Exposed category (represented in dark gray) are those who were at school-going age during the shooting, while Pre-Exposed (light gray) refers to individuals who were too old to be affected and Post-Exposed (medium gray) represents individuals who were too young. Included control variables are parental income, gender, race, father's employment, father's education, mother's education, marital status of the mother at birth, and time since exposure. Birth-year and school-district fixed effects are included. Standard errors are clustered at the school-district level.

and control variables. The main coefficient of interest, β from equation (1), represents the percentage difference in hourly earnings of exposed and non-exposed individuals at age 30 compared to individuals in the same age groups in the neighboring districts.[21] Column (1) shows a statistically significant, negative effect of exposure to shootings on the earnings of exposed individuals controlling for birth-year and district fixed effects. Columns (2)–(5) gradually add sets of controls that I refer to as individual controls, father controls, mother controls, and time since exposure. The effect sizes in columns (1)–(5) are all similar in magnitude and statistically significant.

The most conservative, preferred specification, in column (5), is the model with the complete set of controls and birth-year and school-district fixed ef-

[21] The outcome variable is the hyperbolic sine transformation of hourly earnings to account for the skewness of the earnings data. While results in levels remain qualitatively consistent (Online Appendix Table A6), I present the transformed outcome for clearer interpretation.

Table 1: Effects of School Shootings on Survivors' Earnings

	Dependent variable:				
	Hourly Earnings (IHS) at Age 30				
	(1)	(2)	(3)	(4)	(5)
Exposed	-0.239	-0.227	-0.220	-0.224	-0.208
	(0.063)	(0.063)	(0.066)	(0.066)	(0.068)
Individual Controls		×	×	×	×
Father Controls			×	×	×
Mother Controls				×	×
Time since Exposure					×
School District FE	×	×	×	×	×
Birth Year FE	×	×	×	×	×
Mean Hourly Earnings	11.906	11.906	11.906	11.906	11.906
Number of Treated Individuals	1,214	1,214	1,214	1,214	1,214
Clusters	954	954	954	954	954
Observations	5,701	5,701	5,701	5,701	5,701

Note: Each column reports coefficients and standard errors (in parentheses) from the two-way fixed-effects regression equation (1). The unit of observation is the individual. The outcome variable is the inverse hyperbolic sine transformation of the hourly earnings of an individual at age 30. Exposed, the reported independent variable, defines an individual at the relevant school age in a shooting district at the time of the shooting. The control variables are parental income, gender, race, father's employment, father's education, mother's education, marital status of the mother at birth, and time since exposure. Birth-year and school-district fixed effects are included. The mean of Hourly Earnings is the dependent variable's mean for the neighboring group before the shooting. Standard errors are clustered at the school-district level.

fects.[22] The results indicate that individuals exposed to a shooting while at school have 20.8% lower hourly earnings around age 30 compared to non-exposed individuals around the same age.[23] Furthermore, I examine the heterogeneous effects of shootings by race, gender, and parental income (see Online Appendix Table A8). I observe that the coefficient estimates for Black individuals and those with affluent parents are statistically significant at the 1% level. Moreover, the impact of shootings is statistically significant for both genders at the 5% level, with a comparable magnitude of effect.

I examine the effect of school shootings on survivors' lifelong earnings. Online Appendix Table A9 suggests that the hourly earnings of exposed in-

[22]Of the 954 treatment and control districts, 274 are exposed to school shootings, and the remaining are neighboring districts.

[23]To alleviate the concerns that unemployed individuals are entirely driving this effect, I estimate the effect again with unemployed individuals omitted. Online Appendix Table A7 presents the results. The subsample of employed individuals endures 9.5% (statistically significant at the 5% level) lower earnings when they are exposed to a school shooting.

dividuals do not recover from the effect of shootings in the very long term. The effect remains negative until exposed individuals are of age 50 (although the coefficient is not statistically significant for every age group, likely due to a smaller number of observations). I calculate a $\$101,950$ reduction in the lifetime earnings per shooting-exposed individual.[24] Additionally, the hourly earnings of survivors do not grow to the same extent as those of non-exposed individuals. The disparity in the percentage growth of hourly wages between exposed and non-exposed groups can be observed in Online Appendix Figure A3. This figure reveals that throughout their lifetime, the non-exposed group consistently sees a higher percentage increase in hourly earnings than the exposed group. Although this difference narrows and becomes statistically insignificant after age 40, it is crucial to note that the initial income shock, coupled with the stunted income growth for exposed individuals during the first half of their careers, results in a substantial aggregate income loss.

In addition, exposure to shootings reduces individuals' upward income mobility, aligning with the observed decrease in their lifetime earnings. Online Appendix Figure A4 presents the probabilities of reaching the top half and remaining in the bottom half of the US income distribution. Exposed individuals are 4% less likely to attain a position within the top 10% of the income distribution and almost 7% more likely to remain within the bottom 10% of the income distribution.[25]

Exposure to school shootings also affects individuals' career choices and their health and household outcomes. Online Appendix Table A11 displays the effects of school shootings on survivors' occupational decisions. For the most part, the table fails to detect statistically significant differences between exposed and non-exposed individuals regarding career choices. However, column (6) shows that survivors are 32.8% more likely to choose professions that do not require a college degree. Next, Online Appendix Table A12 presents

[24] I calculate the total reduction in lifetime earnings for individuals who have experienced a school shooting by multiplying the average decline in hourly earnings per age group by the average hours worked for each group, using results from the Online Appendix Table A9.

[25] Online Appendix Table A10 displays the effect of school shootings on the income distribution, with similar results.

the results of the effect of shootings on health outcomes. Columns (1) and (2) show a positive yet statistically insignificant change in survivors' mental health and antidepressant consumption, and column (3) shows a detrimental yet statistically insignificant difference in survivors' overall health status. Although the results lack precision because the number of treated individuals is low, they point in the same direction as Rossin-Slater et al. (2020), who find that exposure to school shootings increases antidepressant use in exposed youth. Additionally, columns (4) and (6) indicate that survivors have a higher propensity to smoke and have higher body mass indexes (statistically significant at the 10% and 5% levels, respectively). All of these results confirm the findings of Deb and Gangaram (2021) who show an increase in the risk of smoking and deterioration of overall health status.

Finally, Online Appendix Table A13 shows the effects of shootings on household outcomes such as house value, home-ownership, family size, marital status, vacation, and life satisfaction. Results indicate that survivors typically own houses worth less, have larger families, are more likely to be married, and take less vacation time than non-exposed individuals.[26]

4.2 Robustness

I start by performing further sensitivity analyses to reinforce the validity of the identification strategy and reaffirm the findings of Section 4.1. I estimate the effects using alternative specifications to assess whether the estimates are sensitive to different definitions of exposure and composition of districts. First, I exploit variation only within shooting districts by comparing exposed with pre-exposed individuals (Online Appendix Table A14). Second, I compare exposed and neighboring districts only after the shooting period to see whether the decrease in hourly earnings resulted from a negative shock to earnings of the pre-exposed group in the shooting district (Online Appendix Table A15). The outcomes from both tables affirm the consistency of the findings.

I use a nearest-neighbor matching approach to address remaining concerns

[26]The coefficient estimates related to family size and vacation duration are statistically significant at the 10% level.

about factors influencing locations of shootings. In this approach, I match control districts that are similar in observable characteristics (displayed in Online Appendix Table A17) to the shooting districts. The algorithm identifies and selects the control districts for each shooting district based on the aforementioned school-district-level characteristics (measured before shootings). The matching approach uses control districts from neighboring school districts. The results, indicating consistently negative and statistically significant coefficients, are presented in the Online Appendix Table A18.

Next, I limit the shootings to the ones that happened after school hours and on weekends (Online Appendix Table A19). If survivors' hourly earnings decrease because they were exposed to shootings, then one should expect little association between the outcome and the shootings outside of school hours. As expected, the effects are smaller and not statistically significant. Last, to address selective migration, I change the definition of individuals who are included in the control group to *anyone that has ever lived in the neighboring district*. The results are shown in Online Appendix Table A20. Once again, the estimates throughout all the columns are statistically significant, albeit smaller in size than in the main table. These findings substantiate that the impact of shootings stems from the exposure to such events, rather than pre-existing trends or correlated shocks.

Furthermore, should a substantial portion of students relocate across various districts following high school graduation, it is likely that many from these older cohorts attended high school in a district different from where the school shooting occurred. As a result, they may not share the same characteristics or experiences as individuals who attended schools in the same district. To address this issue, I have tested the robustness of the results by creating an alternative set of older cohorts. I define these cohorts as individuals who attended a school in the same district 5 years before the school shooting. The Online Appendix Table A21 displays the results of this robustness check, showing findings that are similar to the main results.

Finally, one might be concerned that labor markets in exposed and neighboring districts are subject to similar shocks. To alleviate this concern, I

estimate the effects again but this time cluster the standard errors at the *district-cluster* and state levels.[27] Online Appendix Table A22 presents the estimates with standard errors clustered at the district-cluster level. Similarly, Online Appendix Table A23 presents the estimates with standard errors clustered at the state level. In both tables, the coefficient estimates are statistically significant. Finally, in Online Appendix Figure A6, I report regression estimates in which I omit states one at a time to show that no particular state is driving the results. Overall, placebo regressions, different sample definitions, removing single states from the sample, and alternative clustering techniques confirm the robustness of the findings.

4.3 Discussion

Contemporaneous studies by Cabral et al. (2021), Deb and Gangaram (2021), and Levine and McKnight (2021) present evidence that shooting-exposed students show increased absence rates, worse test scores, and lower likelihood of graduation.[28] They show that shootings have detrimental effects on survivors' physical and mental health outcomes. As will be discussed in Section 5, the findings of this paper on the impact of shootings on education and health outcomes corroborate these pivotal studies, utilizing a more expansive dataset. Therefore, this section will focus on comparing earnings-related findings with existing literature.

Moreover, Cabral et al. (2021) conducts a critical parallel investigation into the effects of school shootings on survivors' earnings, reporting a 13.5% decrease in annual wages for those aged 24-26. The differences between this paper and the aforementioned research primarily revolve around the treatment scope and the specific ages for which outcomes are assessed. The abovementioned paper examines the impact on earnings at age 25 at the school level. A comparable assessment of this paper is shown in Column (1) of Online

[27] I define a district cluster as the exposed district and the cluster of neighboring districts around it. There are no overlapping district clusters, as districts neighboring more than one shooting district are omitted from the control group.

[28] In Section 5.1, I confirm their results by showing that exposed students are 7% less likely to graduate from high school and 20% less likely to obtain a college degree.

Appendix Table A9, which outlines the influence of shootings on 25-year-old earnings, indicating an 11.2% drop in hourly wages. As expected, this estimate tends to be more conservative, given the broader lens employed versus the school-specific focus of the other research.

Following Levine and McKnight (2020), I group shootings into four categories: suicides, personally targeted, crime related, and other.[29] Online Appendix Table A24 shows the effect on hourly earnings at age 30 for each category. All coefficients are negative, with statistically significant effects for personally targeted and crime-related shootings. The results confirm those of previously mentioned studies.

5 Mechanisms

Having delineated the impact of school shootings on various individual outcomes in affected districts, I now explore the underlying drivers of these findings. One potential explanation is the diminishing educational attainment, which may lead to the survivors' decreased earnings. Given the universally recognized correlation between education and future earnings, any adverse effect on education might consequently depress earnings. Additionally, labor market participation, potentially influenced by educational outcomes, may also play a pivotal role.

Third, the aftermath of school shootings might influence school district expenditures. As illustrated by Jackson et al. (2016), a consistent 10% increase in per-pupil spending throughout K-12 education can lead to approximately 7% higher adult wages. Therefore, if school shootings directly impede school district budgets, this financial shift could be another contributing mechanism. Lastly, drawing from emerging research on the influence of neighborhoods, de-

[29] According to the Center for Homeland Defense and Security's classifications, escalation of a dispute, anger over grade/suspension/discipline, bullying, domestic disputes with a targeted victim, and murder constitute *personally targeted shootings*; gang-related shootings, hostage standoffs, illegal-drug-related shootings, and robberies constitute *crime-related shootings*; and mental-health-related shootings, intentional property damage, officer-involved shooting, racial shootings, self-defense, accidental shootings, and unknown shootings constitute *other shootings. Suicides* is a group of its own.

creased geographic mobility could also be a key driver. As shown by Chyn and Katz (2021), the neighborhoods in which individuals grow up can profoundly impact their future labor market outcomes. Thus, reduced likelihood to relocate from a district affected by a shooting might further shape adult earnings trajectories.

The empirical design presented isolates a singular shock that impacts a wide array of outcomes. This setup, however, does not readily support deciphering the distinct effects along this causal chain. While factors such as education and mobility could account for disparities in earnings, the reverse causation cannot be discounted. For instance, anticipated job prospects might shape geographic mobility choices rather than geographic mobility influencing job opportunities. Similarly, individuals might tailor their educational paths based on future job aspirations. This section, therefore, delves into the potential explanations for these foundational drivers.

5.1 Education

I start by investigating the relationship between school shootings and educational outcomes. The results of estimating equation (1) for academic achievements are shown in Table 2, with each column reporting on dependent variables representing different educational achievements. All of the estimates are negative and statistically significant, implying a strong adverse effect of shootings on educational outcomes.

Column (1) reveals that survivors typically receive around four months less of education. This reduction might stem from heightened absenteeism after a shooting event. As highlighted by Beland and Kim (2016), students affected by shootings often have elevated absence rates and are more prone to repeating grades. Such disruptions could culminate in a diminished high school graduation rate. Columns (2) and (3) further underscore this, indicating that survivors are 7% less likely to finish high school and 20% less inclined to earn college degrees.

The findings can be benchmarked to Psacharopoulos and Patrinos (2018),

Table 2: Effects of School Shootings on Survivors' Educational Achievements

	Dependent variable:		
	Years of Schooling	High School Degree	College Degree
	(1)	(2)	(3)
Exposed	-0.386	-0.061	-0.042
	(0.163)	(0.014)	(0.020)
Control Variables	×	×	×
School District FE	×	×	×
Birth Year FE	×	×	×
Mean Dependent Variable	12.784	0.840	0.206
Number of Treated Individuals	1,214	1,214	1,214
Clusters	954	954	954
Observations	5,701	5,701	5,701

Note: Each column reports coefficients and standard errors (in parentheses) from the two-way fixed-effects regression equation (1). Exposed, the reported independent variable, is an individual at the relevant school age in a shooting district at the time of the shooting. The unit of observation is the individual. The outcome variables are years of completed education, high school diploma, and college degree. The control variables are parental income, gender, race, father's employment, father's education, mother's education, mother's marital status at birth, and time since exposure. Birth-year and school-district fixed effects are included. The mean of the dependent variable is the dependent variable's mean for the neighboring group before the shooting. Standard errors are clustered at the school-district level.

who find the average return to a year of schooling to be 9% a year. I conduct a back-of-the-envelope calculation based on the estimates of Table 1. This suggests that the reduction in years of education due to school shootings accounts for an eighth of the decrease in hourly earnings. Furthermore, benchmarking on the annual Census Bureau report, I deduce that around a quarter of the diminished earnings can be attributed to missed college degrees as a consequence of school shootings.[30] Together, these findings indicate that the decrease in schooling explains a significant amount of the decline in earnings.

Having shown that school shootings affect student educational outcomes, I explore heterogeneity in these estimates across students' race, gender, and parental income. In the Online Appendix Table A27, we observe the heterogeneous effects of school shootings on high school degree attainment. All coefficients presented are notably negative and statistically significant. Conversely, the Online Appendix Tables A26 and A28 reveals significant effects exclusively for females regarding completed years of schooling and college de-

[30]National Center for Education Statistics, Current Population Survey, Annual Social and Economic Supplement, 2011-2020. https://nces.ed.gov/programs/coe/indicator/cba

gree attainment.[31]

This section corroborates previous research showing that students exposed to shootings have higher absence rates, poorer test scores, and a reduced likelihood of graduating (Cabral et al., 2021; Deb and Gangaram, 2021; Levine and McKnight, 2021). It specifically reveals that exposed students are 7% less likely to finish high school and 20% less likely to earn a college degree. Additionally, it examines the variability of educational outcomes, identifying education as a likely factor influencing lower earnings.

5.2 Labor Market Participation

Labor market outcomes often directly stem from educational levels. Typically, workers with higher education tend to experience greater wages, more substantial wage growth, and lower unemployment rates compared to their less-educated counterparts.[32] The preceding section demonstrated a notable impact of school shootings on survivors' educational achievements. In this section, I delve into how these events influence various labor market outcomes.

The labor market outcomes, derived from estimating equation (1), are detailed in Online Appendix Table A29. Column (1) reveals a marginally significant effect: exposed individuals tend to work about 5% fewer hours annually than those unexposed. Column (2) underscores that survivors face a 32.8% higher likelihood of being unemployed by age 30. While coefficients in columns (3) and (4) do not achieve traditional significance, they hint that exposed individuals may lean away from self-employment, earning roughly half the business income of non-exposed peers.

[31] In these tables, the coefficient estimates for other sub-groups are either significant at the 10% percent level or lack statistical significance.

[32] According to the National Center for Education Statistics, in 2020, 43% of high school dropouts aged 25–34 were unemployed, compared to 31% for high school diploma holders and 14% for those with a bachelor's degree or higher. High school graduates also earned 20% more than dropouts, and college graduates earned 60% more than high school graduates. These earning gaps increase with age, as wage growth positively correlates with educational attainment. Among 45- to 49-year-olds, high school graduates earned 27% more than dropouts, and college graduates earned 95% more than high school graduates.

5.3 Mobility

Recent research underscores the significance of one's place of residence on future outcomes (Chetty et al., 2016; Nakamura et al., 2022; Chyn, 2018; Chyn and Katz, 2021). For instance, Chetty et al. (2016) identified marked benefits in adult earnings and college attendance rates for those moving to better neighborhoods. Meanwhile, Chyn (2018) highlighted improved labor and criminal outcomes for children relocated to less impoverished areas following Chicago's demolitions. Chyn and Katz (2021) further emphasized the lasting impact of childhood neighborhoods on adult labor outcomes. Given this, I posit that reduced geographic mobility due to school shootings could contribute to the diminished earnings observed in survivors.

Therefore, I investigate the effects of school shootings on geographic mobility. Table 3 displays the likelihood of an exposed individual relocating from the shooting-exposed location. Each column indicates the probability of moving to a district, county, or state within the top quartile of median household income. The negative coefficient across the board, statistically significant at the 5% level for column (1) and at the 10% level for column (2), indicates that survivors tend not to settle in more affluent regions.[33]

The relationship between geographic mobility and earnings is essential to discern. Recent studies highlight the outsized benefits young individuals gain from relocating to superior neighborhoods (Chetty et al., 2016; Chetty and Hendren, 2018a; Chyn, 2018; Chyn and Katz, 2021). Given that school shootings primarily impact the youth, one would anticipate significant advantages for them from such relocations. Yet, data indicates they are less prone to move than their non-exposed peers. Using Chyn (2018) as a reference, who noted a 16% annual earnings boost for individuals displaced due to housing demolitions in Chicago, back-of-the-envelope calculations suggest reduced mobility from school shootings accounts for a 10% decrease in survivors' earnings.

[33]The Online Appendix Table A30 reveals no notable disparity in the likelihood of survivors and non-exposed individuals relocating from the affected district, irrespective of the destination's socioeconomic status. Meanwhile, Online Appendix Table A32 highlights a discernible negative impact on the odds of transitioning to a university district post-high school, with those exposed to the shooting being 6% less inclined to make this shift.

Table 3: Effects of School Shootings on Survivors' Geographic Mobility

	Dependent variable:		
	Probability to Move		
	Top Quartile District	Top Quartile County	Top Quartile State
	(1)	(2)	(3)
Exposed	-0.043	-0.030	-0.016
	(0.019)	(0.019)	(0.012)
Control Variables	×	×	×
School District FE	×	×	×
Birth Year FE	×	×	×
Mean of Dependent Variable	0.047	0.037	0.036
Number of Treated Individuals	1,214	1,214	1,214
Clusters	954	954	954
Observations	5,701	5,701	5,701

Note: Each column reports coefficients and standard errors (in parentheses) from the two-way fixed-effects regression equation (1). The unit of observation is the individual. The outcome variables are top 25% median-household-income district, top 25% median-household-income county, and top 25% median-household-income state. Exposed, the reported independent variable, defines an individual at the relevant school age in a shooting district at the time of the shooting. Included control variables are parental income, gender, race, father's employment, father's education, mother's education, marital status of the mother at birth, and time since exposure. Birth-year and school-district fixed effects are included. The mean of the dependent variable shows the dependent variables' mean for the neighboring group before the shooting. Standard errors are clustered at the school-district level.

5.4 School-District Spending

School shootings can prompt changes in school district budgets, whether through hiring added security, providing more support personnel, or making infrastructural repairs post-incident. Additionally, schools may bolster their investment in students' education to offset the educational setbacks caused by the trauma they endured. Given this, it is reasonable to postulate that public school expenditure influences student outcomes. As evidenced by Jackson et al. (2016), a surge in per-pupil education spending leads to increased educational attainment, enhanced wages, and decreased adult poverty. Specifically, a 10% yearly rise in such spending throughout one's public school education results in approximately 7% higher adult wages. If school shootings prompt augmented per-pupil education expenditure, this could potentially offset the negative economic impacts of the traumatic event.

I estimate the effect of school shootings on various components of per-pupil spending in school districts, including total spending, spending on ele-

mentary and secondary education, instruction, support services, total salaries, and salaries of instruction staff. I follow an estimation strategy analogous to that shown in equation (1) but focusing on the interaction between *Exposed*, defined at the district-year level, and an indicator for post-period while controlling for year and district fixed effects. To be able to interpret the coefficients as percentage changes in per-pupil spending, I use the inverse hyperbolic sine transformation for the spending components.

Online Appendix Table A33 displays the results of this estimation. I fail to detect statistically significant differences across all per-pupil spending categories.[34] Notably, the table indicates that the rise in per-pupil education spending, which is pertinent to wage growth in adulthood, is not statistically significant.[35] Building on Jackson et al. (2016), I deduce that school-district educational spending does not account for the reduced earnings observed in survivors. Nonetheless, if the coefficient for per-pupil education spending had been statistically significant, one could anticipate a more muted reduction in hourly earnings.

6 The Effect on the Children of the Exposed

6.1 Empirical Strategy

Given the pronounced impact of school shootings on survivors, I now examine whether they have subsequent effects on survivors' children. Understanding intergenerational spillovers is paramount, not just theoretically, but in the broader context of understanding the lasting imprint of trauma on successive generations, as highlighted by the empirical results. The estimation strategy is analogous to that of equation (1) but adds parent-birth-year and parent-high-

[34]The coefficient for total per pupil spending is statistically significant at the 10% percent level.

[35]Online Appendix Table A34 displays the effect of school shootings on various school-district-revenue elements (total, federal, state, and local). I measure the revenue components as the inverse hyperbolic sine transformation so I can interpret the coefficients as percentage changes in per-pupil revenue. Confirming Yang and Gopalan (2021), I find a statistically significant increase in the federal revenue of a school district after a shooting incident.

school-district fixed effects, and *Exposed* is now defined as having an exposed parent. Furthermore, parental income and parental controls are replaced with grandparental income and grandparental controls, as parental income is affected by parents' exposure. For each outcome variable, I estimate regression equations of the following form:

$$y_{i,d_p,d_c,t_p,t_c+30} = \beta Exposed_{i,d_p,t_p+\tau} + \boldsymbol{X}_i'\gamma + \alpha_{d_c} + \delta_{t_c} + \eta_{d_p} + \gamma_{t_p} + \varepsilon_{i,d_p,d_c,t_p,t_c+30} \quad (2)$$

where y_{i,d_p,d_c,t_p,t_c+30} represents the outcome for individual i, who was born in year t_c, attended school district d_c, and whose parent was born in year t_p and attended school district d_p. The dummy variable $Exposed_{i,d_p,t_p+\tau}$ denotes whether an individual's parent was exposed to a shooting, with, τ indicating the age of the parent at the time of exposure. X_i encompasses predetermined controls for individual i, including race, gender, grandparental income during upbringing, educational accomplishments of both grandparents, the grandfather's employment details, the grandmother's marital status when the parent was born, and the time since the parent's exposure to the shooting.[36] I use school-district, birth-year, parent school-district, and parent birth-year fixed effects, respectively—α_{d_c}, δ_{t_c}, η_{d_p} and γ_{t_p} in equation (2). I cluster standard errors at the parent-school-district level.

6.2 Main Results

Table 4 displays the estimation results for hourly earnings, years of completed education, and probability of getting college and high school degrees for the children of the exposed individuals. Each column represents a separate regression with different sets of control variables and fixed effects for the aforementioned outcome variables. The main coefficient of interest represents the percentage difference in hourly earnings of children of exposed individuals compared to the children of non-exposed individuals at age 30. Column (1) shows a statistically significant, negative effect of having an exposed parent on the

[36] In some analyses, outcome variables measured at different times are used. Unless otherwise specified, the variable is calculated for $t + 30$.

Table 4: Effects on Survivors' Children Earnings and Education

	Dependent variable:					
	Hourly Earnings (IHS)			Years of Schooling		
Panel A	(1)	(2)	(3)	(4)	(5)	(6)
Exposed Parent	-0.374	-0.161	-0.188	-1.729	-1.234	-0.581
	(0.001)	(0.005)	(0.088)	(0.003)	(0.015)	(0.112)
Mean of Dependent Variable	26.905	26.905	26.905	12.773	12.773	12.773
	College Degree			High School Degree		
Panel B	(7)	(8)	(9)	(10)	(11)	(12)
Exposed Parent	-0.018	-0.016	-0.011	-0.219	-0.208	-0.180
	(0.001)	(0.002)	(0.008)	(0.003)	(0.003)	(0.034)
Mean of Dependent Variable	0.256	0.256	0.256	0.848	0.848	0.848
Parent School District FE	×	×	×	×	×	×
Parent Birth Year FE	×	×	×	×	×	×
Control Variables		×	×		×	×
School District FE			×			×
Birth Year FE			×			×
Number of Treated Individuals	45	45	45	45	45	45
Clusters	127	127	127	127	127	127
Observations	1,951	1,951	1,951	1,951	1,951	1,951

Note: Each column reports coefficients and standard errors (in parentheses) from a two-way fixed effects regression displayed in equation (1). The unit of observation is the individual. The outcome variables are inverse hyperbolic sine transformation of hourly earnings at age 30, years of completed education, college degree, and high school degree. Exposed parent, the reported independent variable, defines an individual who has shooting-exposed parents. Included control variables are grandparent income, gender, race, grandfather's employment, grandfather's education, grandmother's education, marital status of grandmother at birth, and time since parent's exposure. Parent birth year, parent-school district, birth year, and school-district fixed effects are included. The mean of the dependent variable shows the dependent variables' mean for the neighboring group before the shooting. Standard errors are clustered at the parent school-district level.

earnings of a child when controlling for parent-birth-year and parent-school-district fixed effects. Column (2) adds several sets of controls: individual controls, grandfather controls, grandmother controls, and time since exposure. Finally, column (3) adds school-district and birth-year fixed effects. Column (3) shows that having an exposed parent leads to a decrease of 18.8% in a child's future earnings. Recall that the comparable specification in column (5) of Table 1 finds a 20.8% decrease in the hourly earnings of initially exposed individuals. This implies very little intergenerational decay in the effects of school shootings.

Having a shooting-exposed parent affects the future income mobility of the second generation, not just the initially exposed. The results from Online Appendix Table A38 suggest that children of parents exposed to a school shooting face significant challenges in upward income mobility. Specifically, these children face a heightened 10% risk of landing in the bottom quartile of the US income distribution. This underscores the profound and lasting impact of a parent's school shooting experience on their child's economic positioning.

6.3 Mechanisms

Section 6.2 indicate that school shootings' effects ripple into subsequent generations. To delve deeper into what drives this enduring impact, I explore how such traumatic events influence the next generation's educational outcomes and geographic mobility. Again, isolating the individual effects of school shootings is complicated. Although I suggest factors like education, mobility, and child development impact children's earnings, the causality might be bidirectional. Hence, this section aims to offer insights into the possible mechanisms.

In Table 4, columns (4)-(12) explore educational attainment variables. Specifically, columns (4)-(6) focus on years of education, (7)-(9) on obtaining a college degree, and (10)-(12) on high school graduation. The comprehensive analysis in column (6) reveals that children of exposed parents receive roughly six months less education than their counterparts. While column (9) presents a non-significant negative trend in college-degree attainment for those with exposed parents, column (12) indicates they are 20% less likely to complete high school. Benchmarking the findings to Psacharopoulos and Patrinos (2018), I find that the decrease in years of schooling due to having shooting-exposed parents explains about a fifth of the decline in adult hourly earnings of children.

Next, I investigate the effect of school shootings on the geographic mobility of the children of exposed individuals in Online Appendix Table A35. The outcome variable is the likelihood of these children living in areas within the top quartile of median household income. Results indicate around 40% decline

in the propensity of these children to relocate to wealthier school districts, as seen in column (1). Moreover, column (2) reveals a 15% drop in the likelihood of them moving to counties with median incomes in the top quartile of the income distribution. While column (3) suggests a similar trend for state migration, the result is statistically insignificant, perhaps due to the general rarity of inter-state relocations. The results suggest a decreased tendency for children of exposed parents to migrate to more prosperous areas.

Recent studies underscore the profound influence of neighborhood conditions on intergenerational mobility (Chetty and Hendren, 2018a; Chetty and Hendren, 2018b; and others). Notably, Chetty and Hendren (2018a) and Chyn (2018) highlight the amplified benefits younger children gain from residing in superior neighborhoods compared to teenagers. This suggests that childhood exposure to prosperous environments can significantly bolster long-term economic outcomes. Therefore, limited geographic mobility may have a more pronounced negative effect on the earnings of children with shooting-exposed parents than the parents themselves. Drawing on these insights and benchmarking on Chetty and Hendren (2018a), I deduce that reduced mobility accounts for a fifth of the diminished adult hourly earnings observed in these children. The findings suggest that the primary drivers impacting both the first and second generations are consistent, pointing to education and geographic mobility.

6.4 Intergenerational Effects on Child Development

A crucial yet unexplored aspect in the existing literature is the potential detrimental impact of shootings on child development, which could contribute to diminished earnings among the second generation. Beyond impacting future earnings and educational achievements, the effects of having an exposed parent manifest well before adulthood. Leveraging data from the Child Development Supplement of the PSID, I investigate the influence of having a shooting-exposed parent on children's academic aspirations, self-perception, and per-

ceived capabilities.[37]

As detailed in Online Appendix Table A36, children with shooting-exposed parents perceive their math skills as inferior to their peers and exhibit lower self-esteem than children without such exposure. Trzesniewski et al. (2006) highlight that childhood low self-esteem can predict challenges in adulthood, including diminished economic prospects. This finding could illuminate the persistent effects observed in the subsequent generation.

Online Appendix Table A37 reveals that children of shooting-exposed parents have diminished school aspirations and expectations. Additionally, they converse less about their future with parents and peers than children without such exposure. Childhood aspirations are a pivotal determinant of young people's career trajectories. Research indicates that children with higher aspirations tend to have higher earnings in adulthood (Schoon and Parsons, 2002; Ashby and Schoon, 2010). This might shed light on the persistent intergenerational impacts of shooting exposure.

7 Conclusion

Understanding the lasting impacts of school shootings on student outcomes is essential, given their frequency in the United States, to better support survivors and reduce societal harm.

This paper uses comprehensive longitudinal data from the PSID to reveal that school shootings impart lasting and even intergenerational consequences on survivors' educational accomplishments, earnings, and geographic movements. I study the effects of shootings at American public schools between 1970 and 2007, focusing on incidents that took place during school hours and on school grounds and exploiting the variation in these shootings' geographic

[37]Data from the Child Development Supplement of the PSID, utilized in Online Appendix Table A37 and Table A36, encompasses school aspirations and expectations for the years 2002, 2007, and 2014. It also includes communication metrics with mothers, fathers, and friends from 2002 and 2007, and evaluations of math and reading skills, along with global self-concept, for 2002, 2007, and 2014. These variables aren't accessible for the initially treated group.

and temporal distribution.

The results demonstrate that students exposed to school shootings experience a decline in their human capital and face challenges in the labor market. Specifically, those exposed to shootings in their education years earn 20.8% less per hour by age 30. This wage gap persists throughout their lives, preventing them from achieving earnings comparable to their non-exposed peers. The results further show that these individuals attain lower educational levels: they have a 7% reduced chance of graduating high school and a 20% decreased likelihood of obtaining a college degree. In the labor market, exposed individuals face a higher risk of unemployment by age 30. Notably, these survivors are significantly less likely to relocate from the sites of the shootings, potentially confining them to poverty-stricken areas and limiting their economic prospects.

A particularly striking finding is that the impact of school shootings persists beyond the initially treated and extends to the second generation. Children born to parents exposed to shootings tend to fare worse in educational achievement, earn less as adults, and show reduced geographical mobility. Specifically, on average, these children receive six months less education compared to their counterparts with non-exposed parents and face a 10% decreased likelihood of completing high school.

This paper underscores the profound and far-reaching consequences of school shootings on survivors. The long-term impacts suggest that our current measures to address the aftermath of such events are insufficient, and we urgently need enhanced post-trauma support and preventive measures. Immediate interventions should encompass counseling, community support, and tailored educational programs to address survivors' academic setbacks. For long-term recovery, job training, employer incentives, relocation grants, and affordable housing schemes in high-opportunity areas can boost economic opportunities and geographic mobility. While post-event interventions are crucial, more resources should be invested in preventive measures. This includes school safety programs, gun control measures, and mental health services for at-risk individuals. In conclusion, addressing the ramifications of school shootings requires a multi-pronged, sustained approach that acknowledges the im-

mediate trauma and the enduring socio-economic impacts on survivors and their descendants.

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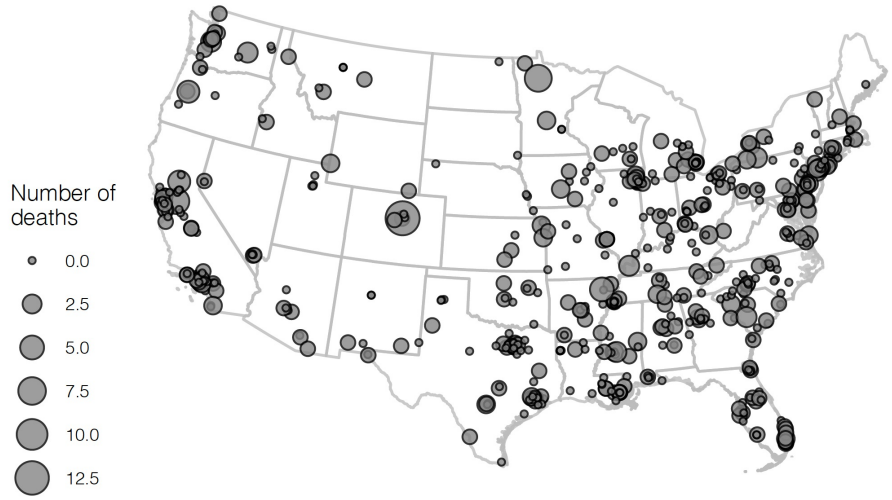
Online Appendix to:

The Legacy of School Shootings:
The Long-Term and Intergenerational Effects

by Hazal Sezer

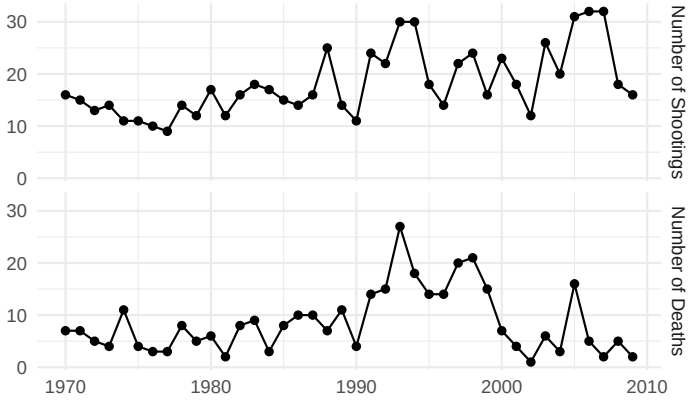
A Figures and Tables

Figure A1. Geographic Distribution of School Shootings in the United States



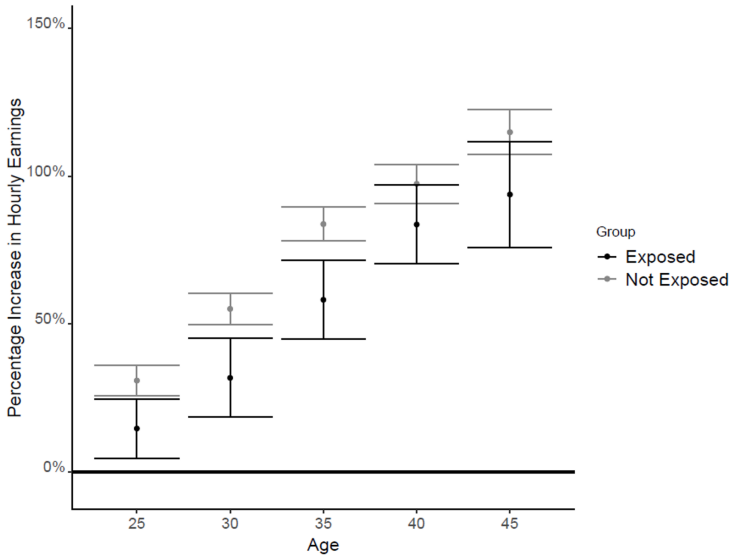
Note: This figure shows a map of the locations of the 635 shootings that occurred on a weekday, during school hours, and on school grounds at United States public schools between 1970 and 2009. The data on school shootings are compiled from the Center for Homeland Defense and Security (CHDS) K-12 school shooting database.

Figure A2. Temporal Distribution of School Shootings in the United States



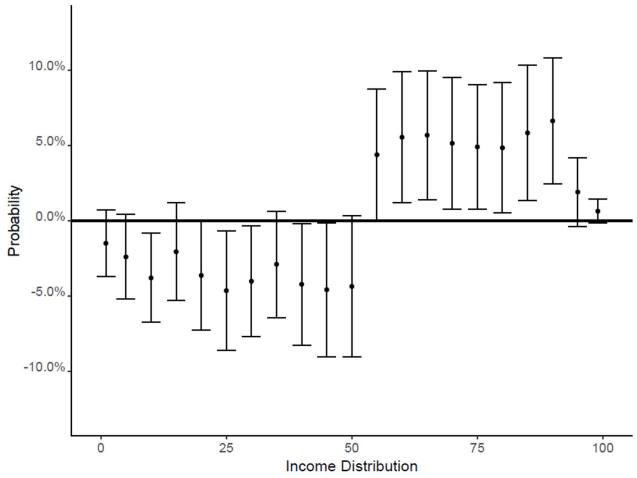
Note: This figure is a time series of the 635 shootings that occurred on a weekday, during school hours, and on school grounds at United States public schools between 1970 and 2009. The panel on top shows the time series plot of the number of shootings that occurred each year. The panel at the bottom shows the time series plot of the number of deaths that occurred each year. The data on school shootings are compiled from the Center for Homeland Defense and Security (CHDS) K-12 school shooting database.

Figure A3. Effects of School Shootings on Survivors' Lifelong Earnings



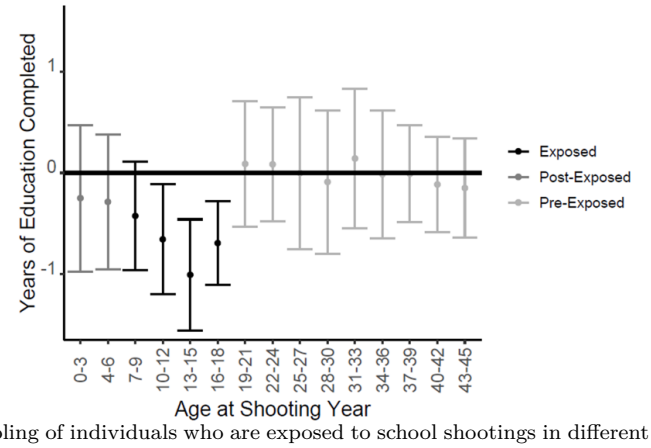
Note: This figure shows the percentage increase in hourly earnings for exposed and not exposed individuals at different age groups. The coefficients reported are from a regression analogous to equation (1) where Exposed is interacted with age groups 25, 30, 35, 40, and 45-plus. The base group is age 20. Light gray points and confidence intervals show the percentage increase in the hourly earnings of not exposed individuals compared to age 20. Dark gray points and confidence intervals show the percentage increase in the hourly earnings of exposed individuals compared to age 20.

Figure A4. Income Distribution



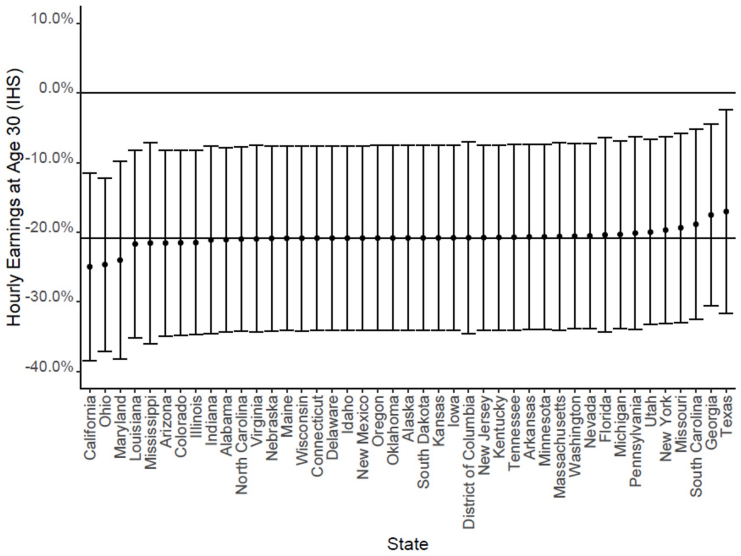
Note: This figure shows the income distribution of exposed individuals. Each point and confidence interval is obtained from a separate regression analogous to equation (1) where the outcome variables are probabilities of reaching the top 1%, the top 5%, the top 10%, the top 15%, the top 20%, the top 25%, the top 30%, the top 35%, the top 40%, the top 45%, the top 50%, the bottom 45%, the bottom 40%, the bottom 35%, the bottom 30%, the bottom 25%, the bottom 20%, the bottom 15%, the bottom 10%, the bottom 5%, and the bottom 1%.

Figure A5. Effects of School Shootings on Education for Different Age Groups



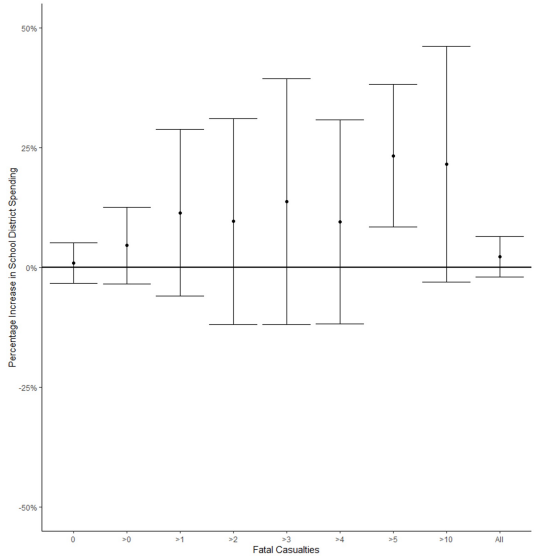
Note: Years of schooling of individuals who are exposed to school shootings in different age bins. Each point reports the coefficients and confidence intervals from different regressions following the estimation strategy shown in equation (1). The outcome variable is the years of education completed by an individual at age 30. Individuals in the Exposed category (represented in dark gray) are those who were at school-going age during the shooting, while Pre-Exposed (light gray) refers to individuals who were too old to be affected and Post-Exposed (medium gray) represents individuals who were too young. Included control variables are parental income, gender, race, father's employment, father's education, mother's education, marital status of the mother at birth, and time since exposure. Birth-year and school-district fixed effects are included. Standard errors are clustered at the school-district level.

Figure A6. Leave One Out Plot



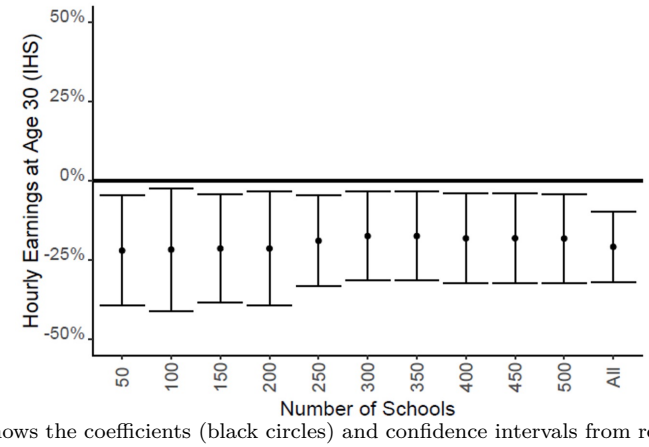
Note: This figure plots the coefficients (black circles) and confidence intervals from regressions of Exposed on inverse hyperbolic sine transformation of hourly earnings at age 30. A solid black line shows the estimated coefficient from the baseline specification. All individuals inside a given state (shown on the horizontal axis) are excluded from the sample in each regression.

Figure A7. Effects of Casualties on School District Support Spending



Note: This figure shows the coefficients (black circles) and confidence intervals from regressions of Exposed District on school district spending for a different number of fatal casualties. The shooting sample is restricted to the number of fatal casualties shown on the horizontal axis in each regression.

Figure A8. Effects of School Shootings on Hourly Earnings for Different Number of Schools in a District



Note: This figure shows the coefficients (black circles) and confidence intervals from regressions of Exposed on the inverse hyperbolic sine transformation of hourly earnings at age 30 for a subsample of districts with a different number of schools shown on the x-axis.

Table A1: Effects of School Shootings on Survivors' Earnings

	Dependent variable:				
	Hourly Earnings (IHS) at Age 30				
	(1)	(2)	(3)	(4)	(5)
Exposed	-0.234	-0.221	-0.218	-0.222	-0.209
	(0.055)	(0.055)	(0.055)	(0.055)	(0.057)
Individual Controls		×	×	×	×
Father Controls			×	×	×
Mother Controls				×	×
Time since Exposure					×
School District FE	×	×	×	×	×
Birth Year FE	×	×	×	×	×
Mean Hourly Earnings	11.906	11.906	11.906	11.906	11.906
Number of Treated Individuals	1,214	1,214	1,214	1,214	1,214
Clusters	954	954	954	954	954
Observations	5,701	5,701	5,701	5,701	5,701

Note: Each column reports coefficients and standard errors (in parentheses) from the two-way fixed-effects regression equation (1). The unit of observation is the individual. The outcome variable is the inverse hyperbolic sine transformation of the hourly earnings of an individual at age 30 (average of 29-31). Exposed, the reported independent variable, defines an individual at the relevant school age in a shooting district at the time of the shooting. The control variables are parental income, gender, race, father's employment, father's education, mother's education, marital status of the mother at birth, and time since exposure. Birth-year and school-district fixed effects are included. The mean of Hourly Earnings is the dependent variable's mean for the neighboring group before the shooting. Standard errors are clustered at the school-district level.

Table A2: Effects of School Shootings on Survivors' Earnings by Land Area

	Dependent variable:				
	Hourly Earnings (IHS) at Age 30				
	(1)	(2)	(3)	(4)	(5)
Exposed	-0.278	-0.270	-0.258	-0.270	-0.283
	(0.084)	(0.085)	(0.087)	(0.086)	(0.086)
Exposed*LandArea	0.071	0.079	0.071	0.084	0.138
	(0.123)	(0.123)	(0.129)	(0.128)	(0.128)
Individual Controls		×	×	×	×
Father Controls			×	×	×
Mother Controls				×	×
Time since Exposure					×
School District FE	×	×	×	×	×
Birth Year FE	×	×	×	×	×
Mean Hourly Earnings	11.906	11.906	11.906	11.906	11.906
Number of Treated Individuals	1,214	1,214	1,214	1,214	1,214
Clusters	954	954	954	954	954
Observations	5,701	5,701	5,701	5,701	5,701

Note: Each column reports coefficients and standard errors (in parentheses) from a two-way fixed effects regression displayed in equation (1). The unit of observation is the individual. The outcome variable is the inverse hyperbolic sine transformation of the hourly earnings of an individual at age 30. Exposed, the reported independent variable, defines an individual at a relevant school-going age in a shooting district at the time of the shooting. Exposed*LandArea is the interaction between Exposed and the land area of school districts. Included control variables are parental income, gender, race, father's employment, father's education, mother's education, marital status of the mother at birth, and time since exposure. Birth-year and school-district fixed effects are included. The mean of Hourly Earnings shows the dependent variable's mean for the neighboring group before the shooting. Standard errors are clustered at the school-district level.

Table A3: Effects of School Shootings on Survivors' Earnings by Urbanicity

	Dependent variable:		
	Urban	Suburban	Rural
	(1)	(2)	(3)
Exposed	-0.208	-0.209	-0.188
	(0.077)	(0.104)	(0.089)
Control Variables	×	×	×
School District FE	×	×	×
Birth Year FE	×	×	×
Mean Dependent Variable	11.148	13.080	11.895
Number of Treated Individuals	1,051	155	8
Clusters	661	206	87
Observations	3,922	1,556	223

Note: Each column reports coefficients and standard errors (in parentheses) from a two-way fixed effects regression displayed in equation (1). The unit of observation is the individual. The outcome variable is the inverse hyperbolic sine transformation of hourly earnings at age 30. Exposed, the reported independent variable, defines an individual at a relevant school-going age in a shooting district at the time of the shooting. Columns (1), (2), and (3) present the coefficient estimate for the urban, suburban, and rural school districts, respectively. Included control variables are parental income, gender, race, father's employment, father's education, mother's education, marital status of the mother at birth, and time since exposure. Birth-year and school-district fixed effects are included. The mean of Hourly Earnings shows the dependent variable's mean for the neighboring group before the shooting. The mean of Hourly Earnings shows the dependent variable's mean for the neighboring group before the shooting. Standard errors are clustered at the school-district level.

Table A4: Mean of School District Characteristics

	Shooting Districts	Neighboring Districts	All Districts	p-value (1)-(2)	p-value (1)-(3)
	(1)	(2)	(3)	(4)	(5)
Median Income	22,776	24,038	29,871	0.149	0.000
Unemployment Rate	0.066	0.065	0.062	0.137	0.000
Fraction Black	0.157	0.149	0.134	0.226	0.000
Fraction White	0.567	0.584	0.611	0.000	0.000
Fraction Race-Other	0.276	0.267	0.255	0.054	0.000
Fraction Female	0.542	0.542	0.526	0.736	0.000
Fraction Parent Income (Poor)	0.484	0.471	0.424	0.085	0.000
Fraction Mother Marital Status (Married)	0.308	0.313	0.354	0.102	0.000
Fraction Mother College Degree	0.037	0.038	0.042	0.167	0.000
Fraction Mother High School Degree	0.286	0.291	0.343	0.116	0.000
Fraction Father College Degree	0.049	0.052	0.054	0.016	0.000
Fraction Father High School Degree	0.231	0.238	0.272	0.220	0.000
Number of Students per School	661.554	704.079	701.196	0.502	0.531
Number of Schools	65.238	59.127	59.542	0.488	0.517

Note: Mean of school district characteristics. All variables are measured prior to the school shootings. Column (1) shows the mean of school district characteristics for the shooting district, column (2) shows the means for neighboring districts, and column (3) shows the means for all districts. Column (4) compares the means of columns (1) and (2), and column (5) compares the means of columns (2) and (3).

Table A5: Effects of School Shootings on Survivors' Earnings, Age Group 19-21 Omitted

	Dependent variable:				
	Hourly Earnings (IHS) at Age 30				
	(1)	(2)	(3)	(4)	(5)
Exposed	-0.239	-0.226	-0.217	-0.221	-0.209
	(0.063)	(0.063)	(0.065)	(0.066)	(0.068)
Individual Controls		×	×	×	×
Father Controls			×	×	×
Mother Controls				×	×
Time since Exposure					×
School District FE	×	×	×	×	×
Birth Year FE	×	×	×	×	×
Mean Hourly Earnings	11.923	11.923	11.923	11.923	11.923
Number of Treated Individuals	1,214	1,214	1,214	1,214	1,214
Clusters	948	948	948	948	948
Observations	5,416	5,416	5,416	5,416	5,416

Note: Each column reports coefficients and standard errors (in parentheses) from a two-way fixed effects regression displayed in equation (1). The unit of observation is the individual. The outcome variable is the inverse hyperbolic sine transformation of the hourly earnings of an individual at age 30. Exposed, the reported independent variable, defines an individual at a relevant school-going age in a shooting district at the time of the shooting. Included control variables are parental income, gender, race, father's employment, father's education, mother's education, marital status of the mother at birth, and time since exposure. Birth-year and school-district fixed effects are included. The mean of Hourly Earnings shows the dependent variable's mean for the neighboring group before the shooting. Standard errors are clustered at the school-district level.

Table A6: Effects of School Shootings on Survivors' Earnings

	Dependent variable:				
	Hourly Earnings at Age 30				
	(1)	(2)	(3)	(4)	(5)
Exposed	-1.668	-1.545	-1.845	-1.750	-1.546
	(0.722)	(0.708)	(0.681)	(0.668)	(0.674)
Individual Controls		×	×	×	×
Father Controls			×	×	×
Mother Controls				×	×
Time since Exposure					×
School District FE	×	×	×	×	×
Birth Year FE	×	×	×	×	×
Mean Hourly Earnings	11.906	11.906	11.906	11.906	11.906
Number of Treated Individuals	1,214	1,214	1,214	1,214	1,214
Clusters	954	954	954	954	954
Observations	5,701	5,701	5,701	5,701	5,701

Note: Each column reports coefficients and standard errors (in parentheses) from the two-way fixed-effects regression equation (1). The unit of observation is the individual. The outcome variable is the hourly earnings of an individual at age 30. Exposed, the reported independent variable, defines an individual at the relevant school age in a shooting district at the time of the shooting. The control variables are parental income, gender, race, father's employment, father's education, mother's education, marital status of the mother at birth, and time since exposure. Birth-year and school-district fixed effects are included. The mean of Hourly Earnings is the dependent variable's mean for the neighboring group before the shooting. Standard errors are clustered at the school-district level.

Table A7: Effects of School Shootings on Survivors' Earnings for Employed

	Dependent variable:				
	Hourly Earnings (IHS) at Age 30				
	(1)	(2)	(3)	(4)	(5)
Exposed	-0.109	-0.101	-0.112	-0.104	-0.095
	(0.040)	(0.039)	(0.040)	(0.040)	(0.041)
Individual Controls		×	×	×	×
Father Controls			×	×	×
Mother Controls				×	×
Time since Exposure					×
School District FE	×	×	×	×	×
Birth Year FE	×	×	×	×	×
Mean Hourly Earnings	13.533	13.533	13.533	13.533	13.533
Number of Treated Individuals	922	922	922	922	922
Clusters	921	921	921	921	921
Observations	4,649	4,649	4,649	4,649	4,649

Note: Each column reports coefficients and standard errors (in parentheses) from a two-way fixed effects regression displayed in equation (1). The unit of observation is the individual. The outcome variable is the inverse hyperbolic sine transformation of the hourly earnings of an individual at age 30. Exposed, the reported independent variable, defines an individual at a relevant school-going age in a shooting district at the time of the shooting. Included control variables are parental income, gender, race, father's employment, father's education, mother's education, marital status of the mother at birth, and time since exposure. Birth-year and school-district fixed effects are included. Unemployed individuals are omitted from the sample. The mean of Hourly Earnings shows the dependent variable's mean for the neighboring group before the shooting. Standard errors are clustered at the school-district level.

Table A8: Effects of School Shootings on Survivors' Earnings by Heterogeneity

	Dependent variable:					
	Hourly Earnings (IHS) at Age 30					
	Parent Income		Race		Gender	
	Poor	Well-off	White	Black	Female	Male
	(1)	(2)	(3)	(4)	(5)	(6)
Exposed	-0.182	-0.421	-0.188	-0.222	-0.222	-0.196
	(0.115)	(0.142)	(0.108)	(0.082)	(0.088)	(0.082)
Controls	×	×	×	×	×	×
School District FE	×	×	×	×	×	×
Birth Year FE	×	×	×	×	×	×
Mean Hourly Earnings	9.512	14.012	14.891	8.652	11.702	12.137
Number of Treated Individuals	561	281	476	672	631	583
Clusters	462	470	772	299	719	682
Observations	2,309	1,303	2,472	2,950	2,985	2,716

Note: Each column reports coefficients and standard errors (in parentheses) from a two-way fixed effects regression displayed in equation (1). The unit of observation is the individual. The outcome variable is the inverse hyperbolic sine transformation of the hourly earnings of an individual at age 30. Exposed, the reported independent variable, defines an individual at a relevant school-going age in a shooting district at the time of the shooting. Column (1) restricts the sample to individuals with poor parental income, column (2) to individuals with well-off parental income, column (3) restricts the sample to white people, column (4) to Black people, column (5) restricts the sample to females and column (6) to males. Included control variables are gender, race, father's employment, father's education, mother's education, marital status of the mother at birth and time since exposure for columns (1) and (2); parental income, gender, father's employment, father's education, mother's education, marital status of the mother at birth and time since exposure for columns (3) and (4), and parental income, race, father's employment, father's education, mother's education, marital status of the mother at birth and time since exposure for columns (5) and (6). Birth-year and school-district fixed effects are included. The mean of Hourly Earnings shows the dependent variable's mean for the neighboring group before the shooting. Standard errors are clustered at the school-district level.

Table A9: Effects of School Shootings on Survivors' Lifelong Earnings

	Dependent variable:				
	Hourly Earnings (IHS)				
	Age 25	Age 30	Age 35	Age 40	Age 45 +
	(1)	(2)	(3)	(4)	(5)
Exposed	-0.112	-0.191	-0.214	-0.092	-0.164
	(0.051)	(0.068)	(0.068)	(0.068)	(0.091)
Controls	×	×	×	×	×
School District FE	×	×	×	×	×
Birth Year FE	×	×	×	×	×
Mean Hourly Earnings	9.540	11.190	15.481	18.441	22.270
Number of Treated Individuals	1,962	1,414	999	696	444
Clusters	1,119	981	856	722	568
Observations	7,871	6,429	4,867	3,650	2,555

Note: Each column reports coefficients and standard errors (in parentheses) from the two-way fixed effects regression displayed in equation (1). The unit of observation is the individual. The outcome variable is the inverse hyperbolic sine transformation of the hourly earnings of an individual in age groups 25, 30, 35, 40, and 45-plus. The base group is age 20. Exposed, the reported independent variable, defines an individual at a relevant school-going age in a shooting district at the time of the shooting. Included control variables are parental income, gender, race, father's employment, father's education, mother's education, marital status of the mother at birth, and time since exposure. Birth-year and school-district fixed effects are included. The mean of Hourly Earnings shows the dependent variable's mean for the neighboring group before the shooting. Standard errors are clustered at the school-district level.

Table A10: Effects of School Shootings on Survivors' Income Distribution

	Dependent variable:								
	Income Distribution								
	Top 1%	Top 5%	Top 10%	Top 25%	Top 50%	Bottom 25%	Bottom 10%	Bottom 5%	Bottom 1%
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Exposed	-0.015	-0.024	-0.038	-0.047	-0.044	0.048	0.066	0.019	0.006
	(0.011)	(0.014)	(0.015)	(0.020)	(0.024)	(0.021)	(0.021)	(0.012)	(0.004)
Controls	×	×	×	×	×	×	×	×	×
School District FE	×	×	×	×	×	×	×	×	×
Birth Year FE	×	×	×	×	×	×	×	×	×
Mean Percentile	0.010	0.050	0.100	0.250	0.500	0.250	0.100	0.050	0.010
Number of Treated Individuals	1,214	1,214	1,214	1,214	1,214	1,214	1,214	1,214	1,214
Clusters	954	954	954	954	954	954	954	954	954
Observations	5,701	5,701	5,701	5,701	5,701	5,701	5,701	5,701	5,701

Note: Each column reports coefficients and standard errors (in parentheses) from a two-way fixed effects regression displayed in equation (1). The unit of observation is the individual. The outcome variables are the probabilities of reaching the top 1%, the top 5%, the top 10%, the top 25%, the top 50%, or staying at the bottom 25%, the bottom 10%, the bottom 5%, and the bottom 1% of the income distribution. Exposed, the reported independent variable, defines an individual at a relevant school-going age in a shooting district at the time of the shooting. Included control variables are parental income, gender, race, father's employment, father's education, mother's education, marital status of the mother at birth, and time since exposure. Birth-year and school-district fixed effects are included. Standard errors are clustered at the school-district level.

Table A11: Effects of School Shootings on Survivors' Occupational Choices

	Dependent variable:					
	Armed	Teacher	Community	Service	Creative	Non-College
	(1)	(2)	(3)	(4)	(5)	(6)
Exposed	-0.005	-0.008	-0.005	-0.007	-0.006	0.024
	(0.003)	(0.005)	(0.003)	(0.009)	(0.004)	(0.010)
Controls	×	×	×	×	×	×
School District FE	×	×	×	×	×	×
Birth Year FE	×	×	×	×	×	×
Mean of Dependent Variable	0.006	0.018	0.005	0.067	0.008	0.073
Number of Treated Individuals	3	17	3	84	5	105
Clusters	809	809	809	809	809	809
Observations	5,139	5,139	5,139	5,139	5,139	5,139

Note: Each column reports coefficients and standard errors (in parentheses) from a two-way fixed effects regression displayed in equation (1). The unit of observation is the individual. The outcome variables are dummies that correspond to an occupation category: armed occupations, teaching occupations, community service occupations, creative occupations, and occupations that do not require a college degree. The count of treated individuals represents those exposed to shootings within the specified occupation category. Exposed, the reported independent variable, defines an individual at a relevant school-going age in a shooting district at the time of the shooting. Included control variables are parental income, gender, race, father's employment, father's education, mother's education, marital status of the mother at birth, and time since exposure. Birth-year and school-district fixed effects are included. The mean of the dependent variable shows the dependent variable's mean for the neighboring group before the shooting. Standard errors are clustered at the school-district level.

Table A12: Effects of School Shootings on Survivors' Health Outcomes

	Dependent variable:					
	Antidep. Cons.	Psy. Problem	Health Status	Smoking	Alcohol Cons.	BMI
	(1)	(2)	(3)	(4)	(5)	(6)
Exposed	0.006	0.004	−0.067	0.057	0.024	0.767
	(0.006)	(0.008)	(0.050)	(0.029)	(0.041)	(0.436)
Controls	×	×	×	×	×	×
School District FE	×	×	×	×	×	×
Birth Year FE	×	×	×	×	×	×
Mean of Dependent Variable	0.009	0.035	1.835	0.243	0.307	28.614
Number of Treated Individuals	1,214	1,214	588	619	619	532
Clusters	954	954	954	663	663	606
Observations	5,701	5,701	5,701	2,527	2,527	2,233

Note: Each column reports coefficients and standard errors (in parentheses) from a two-way fixed effects regression displayed in equation (1). The unit of observation is the individual. The outcome variables are antidepressant consumption, psychological problems, health status, smoking, alcohol consumption, and body mass index. Exposed, the reported independent variable, defines an individual at a relevant school-going age in a shooting district at the time of the shooting. Included control variables are parental income, gender, race, father's employment, father's education, mother's education, marital status of the mother at birth, and time since exposure. Birth-year and school-district fixed effects are included. The mean of the dependent variable shows the dependent variable's mean for the neighboring group before the shooting. Standard errors are clustered at the school-district level.

Table A13: Effects of School Shootings on Survivors' Household Outcomes

	Dependent variable:					
	House Value	House Ownership	Family Size	Marital Status	Weeks Vacation	Life Satisfaction
	(1)	(2)	(3)	(4)	(5)	(6)
Exposed	-223.913	-0.012	0.171	0.066	-0.425	0.029
	(97.923)	(0.024)	(0.101)	(0.030)	(0.226)	(0.033)
Controls	×	×	×	×	×	×
School District FE	×	×	×	×	×	×
Birth Year FE	×	×	×	×	×	×
Mean of Dependent Variable	200,851	0.559	3.288	0.577	1.383	0.622
Number of Treated Individuals	581	581	581	581	1,214	1,214
Clusters	678	678	678	678	954	954
Observations	3,189	3,189	3,189	3,189	5,701	5,701

Note: Each column reports coefficients and standard errors (in parentheses) from a two-way fixed effects regression displayed in equation (1). The unit of observation is the individual. The outcome variables are house value, house ownership, family size, weeks of vacation, and life satisfaction. Outcome variables, house value, house ownership, family size, and marital status are measured at age 40. Exposed, the reported independent variable, defines an individual at a relevant school-going age in a shooting district at the time of the shooting. Included control variables are parental income, gender, race, father's employment, father's education, mother's education, marital status of the mother at birth, and time since exposure. Birth-year and school-district fixed effects are included. The mean of the dependent variable shows the dependent variable's mean for the neighboring group before the shooting. Standard errors are clustered at the school-district level.

Table A14: Effects of School Shootings on Survivors' Earnings, Shooting District

	Dependent variable:				
	Hourly Earnings (IHS) at Age 30				
	(1)	(2)	(3)	(4)	(5)
Exposed	-0.187	-0.174	-0.186	-0.182	-0.146
	(0.082)	(0.084)	(0.081)	(0.078)	(0.075)
Individual Controls		×	×	×	×
Father Controls			×	×	×
Mother Controls				×	×
Time since Exposure					×
School District FE	×	×	×	×	×
Birth Year FE	×	×	×	×	×
Mean Hourly Earnings	10.811	10.811	10.811	10.811	10.811
Number of Treated Individuals	1,214	1,214	1,214	1,214	1,214
Clusters	552	552	552	552	552
Observations	2,988	2,988	2,988	2,988	2,988

Note: Each column reports coefficients and standard errors (in parentheses) from a two-way fixed effects regression displayed in equation (1). The unit of observation is the individual. The outcome variable is the inverse hyperbolic sine transformation of hourly earnings at age 30. Exposed, the reported independent variable, defines an individual at a relevant school-going age in a shooting district at the time of the shooting. Included control variables are parental income, gender, race, father's employment, father's education, mother's education, marital status of the mother at birth, and time since exposure. Birth-year and school-district fixed effects are included. The mean of Hourly Earnings shows the dependent variable's mean for the shooting group before the shooting. The sample is restricted to districts that are exposed to a school shooting (exposed and pre-exposed groups). Standard errors are clustered at the school-district level.

Table A15: Effects of School Shootings on Survivors' Earnings without Pre-Exposed

	Dependent variable:				
	Hourly Earnings (IHS) at Age 30				
	(1)	(2)	(3)	(4)	(5)
Exposed	-0.210	-0.197	-0.189	-0.198	-0.196
	(0.071)	(0.071)	(0.073)	(0.074)	(0.074)
Individual Controls		×	×	×	×
Father Controls			×	×	×
Mother Controls				×	×
Time since Exposure					×
School District FE	×	×	×	×	×
Birth Year FE	×	×	×	×	×
Mean Hourly Earnings	13.276	13.276	13.276	13.276	13.276
Number of Treated Individuals	1,214	1,214	1,214	1,214	1,214
Clusters	599	599	599	599	599
Observations	3,044	3,044	3,044	3,044	3,044

Note: Each column reports coefficients and standard errors (in parentheses) from a two-way fixed effects regression displayed in equation (1). The unit of observation is the individual. The outcome variable is the inverse hyperbolic sine transformation of hourly earnings at age 30. Exposed, the reported independent variable, defines an individual at a relevant school-going age in a shooting district at the time of the shooting. Included control variables are parental income, gender, race, father's employment, father's education, mother's education, marital status of the mother at birth, and time since exposure. Birth-year and school-district fixed effects are included. The mean of Hourly Earnings shows the dependent variable's mean for the neighboring group. The sample is restricted to shooting and neighboring districts in periods following a shooting (pre-periods are not included). Standard errors are clustered at the school-district level.

Table A16: Mean of School District Characteristics, All Set of Districts

	Shooting Districts	Matched Districts	p-value (1)-(2)
	(1)	(2)	(3)
Median Income	29,883	28,592	0.732
Unemployment Rate	0.067	0.062	0.142
Fraction Black	0.163	0.128	0.243
Fraction White	0.724	0.821	0.133
Fraction Race-Other	0.224	0.182	0.116
Fraction Female	0.490	0.502	0.130
Fraction Parent Income (Poor)	0.273	0.326	0.537
Fraction Mother Marital Status (Married)	0.717	0.814	0.202
Fraction Mother College Degree	0.121	0.116	0.934
Fraction Mother High School Degree	0.545	0.605	0.516
Fraction Father College Degree	0.041	0.047	0.873
Fraction Father High School Degree	0.455	0.558	0.262
Number of Students per School	634.440	718.828	0.293
Number of Schools	63.737	24.233	0.000

Note: Mean of school district characteristics. Column (1) shows the mean of school district characteristics for the shooting district, and column (2) shows the means for matched districts. All variables are measured prior to the school shootings.

Table A17: Mean of School District Characteristics, Neighboring Set of Districts

	Shooting Districts	Matched Districts	p-value (1)-(2)
	(1)	(2)	(3)
Median Income	30,654	28,593	0.603
Unemployment Rate	0.072	0.063	0.139
Fraction Black	0.144	0.128	0.588
Fraction White	0.723	0.820	0.133
Fraction Race-Other	0.223	0.182	0.117
Fraction Female	0.489	0.502	0.130
Fraction Parent Income (Poor)	0.241	0.326	0.331
Fraction Mother Marital Status (Married)	0.747	0.814	0.390
Fraction Mother College Degree	0.152	0.116	0.579
Fraction Mother High School Degree	0.633	0.605	0.762
Fraction Father College Degree	0.051	0.047	0.920
Fraction Father High School Degree	0.481	0.558	0.420
Number of Students per School	634.440	768.066	0.133
Number of Schools	67.772	24.231	0.000

Note: Mean of school district characteristics. Column (1) shows the mean of school district characteristics for the shooting district, and column (2) shows the means for matched districts. All variables are measured prior to the school shootings.

Table A18: Effects of School Shootings on Survivors' Earnings - Matching Using Neighboring Set of Districts

	Dependent variable:				
	Hourly Earnings (IHS) at Age 30				
	(1)	(2)	(3)	(4)	(5)
Exposed	-0.230	-0.208	-0.203	-0.208	-0.209
	(0.101)	(0.102)	(0.104)	(0.105)	(0.104)
Individual Controls		×	×	×	×
Father Controls			×	×	×
Mother Controls				×	×
Time since Exposure					×
School District FE	×	×	×	×	×
Birth Year FE	×	×	×	×	×
Mean Hourly Earnings	12.070	12.070	12.070	12.070	12.070
Number of Treated Individuals	459	459	459	459	459
Clusters	479	479	479	479	479
Observations	2,540	2,540	2,540	2,540	2,540

Note: Each column reports coefficients and standard errors (in parentheses) from a two-way fixed effects regression displayed in equation (1). The unit of observation is the individual. The outcome variable is the inverse hyperbolic sine transformation of the hourly earnings of an individual at age 30. Exposed, the reported independent variable, defines an individual at a relevant school-going age in a shooting district at the time of the shooting. Included control variables are parental income, gender, race, father's employment, father's education, mother's education, marital status of the mother at birth, and time since exposure. Birth-year and school-district fixed effects are included. The control group consists of districts selected by the nearest-neighbor matching algorithm from a neighboring set of school districts. The mean of Hourly Earnings shows the dependent variable's mean for the neighboring group before the shooting. Standard errors are clustered at the school-district level.

Table A19: Effects of School Shootings on Survivors' Earnings, After Hours and Weekends

	Dependent variable:				
	Hourly Earnings (IHS) at Age 30				
	(1)	(2)	(3)	(4)	(5)
Exposed	-0.062	0.041	-0.055	-0.084	-0.094
	(0.213)	(0.209)	(0.206)	(0.206)	(0.205)
Individual Controls		×	×	×	×
Father Controls			×	×	×
Mother Controls				×	×
Time since Exposure					×
School District FE	×	×	×	×	×
Birth Year FE	×	×	×	×	×
Mean Hourly Earnings	12.953	12.953	12.953	12.953	12.953
Number of Treated Individuals	108	108	108	108	108
Clusters	369	369	369	369	369
Observations	1,487	1,487	1,487	1,487	1,487

Note: Each column reports coefficients and standard errors (in parentheses) from a two-way fixed effects regression displayed in equation (1). The unit of observation is the individual. The outcome variable is the inverse hyperbolic sine transformation of hourly earnings at age 30. Exposed, the reported independent variable, defines an individual at a relevant school-going age in a shooting district at the time of the shooting. Included control variables are parental income, gender, race, father's employment, father's education, mother's education, marital status of the mother at birth, and time since exposure. Birth-year and school-district fixed effects are included. The mean of Hourly Earnings shows the dependent variable's mean for the neighboring group before the shooting. The sample is restricted to shootings that happened after school hours and on weekends. Standard errors are clustered at the school-district level.

Table A20: Effects of School Shootings on Survivors' Earnings, Alternative Control Group

	Dependent variable:				
	Hourly Earnings (IHS) at Age 30				
	(1)	(2)	(3)	(4)	(5)
Exposed	-0.121	-0.107	-0.121	-0.121	-0.127
	(0.066)	(0.064)	(0.062)	(0.062)	(0.064)
Individual Controls		×	×	×	×
Father Controls			×	×	×
Mother Controls				×	×
Time since Exposure					×
School District FE	×	×	×	×	×
Birth Year FE	×	×	×	×	×
Mean Hourly Earnings	12.882	12.882	12.882	12.882	12.882
Number of Treated Individuals	943	943	943	943	943
Clusters	849	849	849	849	849
Observations	5,102	5,102	5,102	5,102	5,102

Note: Each column reports coefficients and standard errors (in parentheses) from a two-way fixed effects regression displayed in equation (1). The unit of observation is the individual. The outcome variable is the inverse hyperbolic sine transformation of hourly earnings at age 30. Exposed, the reported independent variable, defines an individual at a relevant school-going age in a shooting district at the time of the shooting. Included control variables are parental income, gender, race, father's employment, father's education, mother's education, marital status of the mother at birth, and time since exposure. Birth-year and school-district fixed effects are included. The mean of Hourly Earnings shows the dependent variable's mean for the neighboring group before the shooting. The control group includes anyone that has ever lived in the neighboring district. Standard errors are clustered at the school-district level.

Table A21: Effects of School Shootings on Survivors' Earnings

	Dependent variable:				
	Hourly Earnings (IHS) at Age 30				
	(1)	(2)	(3)	(4)	(5)
Exposed	-0.229	-0.219	-0.213	-0.218	-0.205
	(0.065)	(0.065)	(0.067)	(0.068)	(0.069)
Individual Controls		×	×	×	×
Father Controls			×	×	×
Mother Controls				×	×
Time since Exposure					×
School District FE	×	×	×	×	×
Birth Year FE	×	×	×	×	×
Mean Hourly Earnings	11.065	11.065	11.065	11.065	11.065
Number of Treated Individuals	1,214	1,214	1,214	1,214	1,214
Clusters	916	916	916	916	916
Observations	5,762	5,762	5,762	5,762	5,762

Note: Each column reports coefficients and standard errors (in parentheses) from the two-way fixed-effects regression equation (1). The unit of observation is the individual. The outcome variable is the inverse hyperbolic sine transformation of the hourly earnings of an individual at age 30. Exposed, the reported independent variable, defines an individual at the relevant school age in a shooting district at the time of the shooting. The control variables are parental income, gender, race, father's employment, father's education, mother's education, marital status of the mother at birth, and time since exposure. Birth-year and school-district fixed effects are included. The mean of Hourly Earnings is the dependent variable's mean for the neighboring group before the shooting. Standard errors are clustered at the school-district level. In this regression, "too old to be exposed" refers to cohorts who attended a school in the same district 5 years prior.

Table A22: Effects of School Shootings on Survivors' Earnings, District Cluster Standard Errors

	Dependent variable:				
	Hourly Earnings (IHS) at Age 30				
	(1)	(2)	(3)	(4)	(5)
Exposed	-0.239	-0.227	-0.220	-0.224	-0.208
	(0.069)	(0.070)	(0.073)	(0.072)	(0.076)
Individual Controls		×	×	×	×
Father Controls			×	×	×
Mother Controls				×	×
Time since Exposure					×
School District FE	×	×	×	×	×
Birth Year FE	×	×	×	×	×
Mean Hourly Earnings	11.906	11.906	11.906	11.906	11.906
Number of Treated Individuals	1,214	1,214	1,214	1,214	1,214
Clusters	288	288	288	288	288
Observations	5,701	5,701	5,701	5,701	5,701

Note: Each column reports coefficients and standard errors (in parentheses) from a two-way fixed effects regression displayed in equation (1). The unit of observation is the individual. The outcome variable is the inverse hyperbolic sine transformation of hourly earnings at age 30. Exposed, the reported independent variable, defines an individual at a relevant school-going age in a shooting district at the time of the shooting. Included control variables are parental income, gender, race, father's employment, father's education, mother's education, marital status of the mother at birth, and time since exposure. Birth-year and school-district fixed effects are included. The mean of Hourly Earnings shows the dependent variable's mean for the neighboring group before the shooting. Standard errors are clustered at the district cluster level (a district cluster is the exposed district and the cluster of neighboring districts around it).

Table A23: Effects of School Shootings on Survivors' Earnings, State Cluster Standard Errors

	Dependent variable:				
	Hourly Earnings (IHS) at Age 30				
	(1)	(2)	(3)	(4)	(5)
Exposed	-0.239	-0.227	-0.220	-0.224	-0.208
	(0.077)	(0.077)	(0.078)	(0.079)	(0.081)
Individual Controls		×	×	×	×
Father Controls			×	×	×
Mother Controls				×	×
Time since Exposure					×
School District FE	×	×	×	×	×
Birth Year FE	×	×	×	×	×
Mean Hourly Earnings	11.906	11.906	11.906	11.906	11.906
Number of Treated Individuals	1,214	1,214	1,214	1,214	1,214
Clusters	43	43	43	43	43
Observations	5,701	5,701	5,701	5,701	5,701

Note: Each column reports coefficients and standard errors (in parentheses) from a two-way fixed effects regression displayed in equation (1). The unit of observation is the individual. The outcome variable is the inverse hyperbolic sine transformation of hourly earnings at age 30. Exposed, the reported independent variable, defines an individual at a relevant school-going age in a shooting district at the time of the shooting. Included control variables are parental income, gender, race, father's employment, father's education, mother's education, marital status of the mother at birth, and time since exposure. Birth-year and school-district fixed effects are included. The mean of Hourly Earnings shows the dependent variable's mean for the neighboring group before the shooting. Standard errors are clustered at the state level.

Table A24: Effects of School Shootings on Survivors' Earnings by Shooting Types

	Dependent variable:			
	Hourly Earnings (IHS) at Age 30			
	Suicides	Personally Targeted	Crime Related	Other
	(1)	(2)	(3)	(4)
Exposed	-0.277	-0.250	-0.461	-0.367
	(0.501)	(0.092)	(0.210)	(0.240)
Controls	×	×	×	×
School District FE	×	×	×	×
Birth Year FE	×	×	×	×
Mean Hourly Earnings	10.418	9.993	13.458	12.885
Number of Treated Individuals	22	494	155	102
Clusters	128	380	192	254
Observations	364	2,070	547	746

Note: Each column reports coefficients and standard errors (in parentheses) from a two-way fixed effects regression displayed in equation (1). The unit of observation is the individual. The outcome variable is the inverse hyperbolic sine transformation of hourly earnings at age 30. Exposed, the reported independent variable, defines an individual at a relevant school-going age in a shooting district at the time of the shooting. Columns (1)-(4) restrict the sample to different types of shootings, namely, suicides, personally targeted, crime-related, and other. Included control variables are parental income, gender, race, father's employment, father's education, mother's education, marital status of the mother at birth, and time since exposure. Birth-year and school-district fixed effects are included. The mean of Hourly Earnings shows the dependent variable's mean for the neighboring group before the shooting. Standard errors are clustered at the school-district level.

Table A25: Effects of School Shootings on Survivors' Earnings by Casualties

	Dependent variable:	
Hourly Earnings (IHS) at Age 30		
	All	Death>0
	(1)	(3)
Exposed	-0.208	-0.177
	(0.068)	(0.078)
Controls	×	×
School District FE	×	×
Birth Year FE	×	×
Mean Hourly Earnings	11.906	11.143
Number of Treated Individuals	1,214	984
Clusters	954	301
Observations	5,701	1,974

Note: Each column reports coefficients and standard errors (in parentheses) from a two-way fixed effects regression displayed in equation (1). The unit of observation is the individual. The outcome variable is the inverse hyperbolic sine transformation of hourly earnings at age 30. Exposed, the reported independent variable, defines an individual at a relevant school-going age in a shooting district at the time of the shooting. Column (1) presents the coefficient estimate for the whole sample. Column (2) restricts the sample to shootings with the number of deaths larger than zero, respectively. Included control variables are parental income, gender, race, father's employment, father's education, mother's education, marital status of the mother at birth, and time since exposure. Birth-year and school-district fixed effects are included. The mean of Hourly Earnings shows the dependent variable's mean for the neighboring group before the shooting. The mean of Hourly Earnings shows the dependent variable's mean for the neighboring group before the shooting. Standard errors are clustered at the school-district level.

Table A26: Effects of School Shootings on Survivors' Educational Achievements by Heterogeneity

	Dependent variable:					
	Years of Schooling					
	Parent Income		Race		Gender	
	Poor	Well-off	White	Black	Female	Male
	(1)	(2)	(3)	(4)	(5)	(6)
Exposed	-0.233	-0.660	-0.445	-0.332	-0.396	-0.483
	(0.121)	(0.367)	(0.257)	(0.221)	(0.168)	(0.272)
Controls	×	×	×	×	×	×
School District FE	×	×	×	×	×	×
Birth Year FE	×	×	×	×	×	×
Mean Years of Schooling	12.213	13.273	13.481	12.056	13.010	12.529
Number of Treated Individuals	561	281	176	972	631	583
Clusters	460	470	769	297	719	682
Observations	2,309	1,303	2,472	2.950	2,985	2,716

Note: Each column reports coefficients and standard errors (in parentheses) from a two-way fixed effects regression displayed in equation (1). The unit of observation is the individual. The outcome variable is years of education completed. Exposed, the reported independent variable, defines an individual at a relevant school-going age in a shooting district at the time of the shooting. Column (1) restricts the sample to individuals with poor parental income, column (2) to individuals with well-off parental income, column (3) restricts the sample to white people, column (4) to Black people, column (5) restricts the sample to females and column (6) to males. Included control variables are gender, race, father's employment, father's education, mother's education, marital status of the mother at birth and time since exposure for columns (1) and (2); parental income, gender, father's employment, father's education, mother's education, marital status of the mother at birth and time since exposure for columns (3) and (4), and parental income, race, father's employment, father's education, mother's education, marital status of the mother at birth and time since exposure for columns (5) and (6). Birth-year and school-district fixed effects are included. The mean of Years of Schooling shows the dependent variable's mean for the neighboring group before the shooting. Standard errors are clustered at the school-district level.

Table A27: Effects of School Shootings on Survivors' Educational Achievements by Heterogeneity

	Dependent variable:					
	High School Degree					
	Parent Income		Race		Gender	
	Poor	Well-off	White	Black	Female	Male
	(1)	(2)	(3)	(4)	(5)	(6)
Exposed	-0.069	-0.098	-0.074	-0.064	-0.063	-0.086
	(0.024)	(0.040)	(0.031)	(0.021)	(0.022)	(0.029)
Controls	×	×	×	×	×	×
School District FE	×	×	×	×	×	×
Birth Year FE	×	×	×	×	×	×
Mean High School Degree	0.777	0.891	0.901	0.779	0.867	0.811
Number of Treated Individuals	561	281	176	972	631	583
Clusters	460	470	769	297	719	682
Observations	2,309	1,303	2,472	2.950	2,985	2,716

Note: Each column reports coefficients and standard errors (in parentheses) from a two-way fixed effects regression displayed in equation (1). The unit of observation is the individual. The outcome variable is high school degree. Exposed, the reported independent variable, defines an individual at a relevant school-going age in a shooting district at the time of the shooting. Column (1) restricts the sample to individuals with poor parental income, column (2) to individuals with well-off parental income, column (3) restricts the sample to white people, column (4) to Black people, column (5) restricts the sample to females and column (6) to males. Included control variables are gender, race, father's employment, father's education, mother's education, marital status of the mother at birth and time since exposure for columns (1) and (2); parental income, gender, father's employment, father's education, mother's education, marital status of the mother at birth and time since exposure for columns (3) and (4), and parental income, race, father's employment, father's education, mother's education, marital status of the mother at birth and time since exposure for columns (5) and (6). Birth-year and school-district fixed effects are included. The mean of High School Degree shows the dependent variable's mean for the neighboring group before the shooting. Standard errors are clustered at the school-district level.

Table A28: Effects of School Shootings on Survivors' Educational Achievements by Heterogeneity

	Dependent variable:					
	College Degree					
	Parent Income		Race		Gender	
	Poor	Well-off	White	Black	Female	Male
	(1)	(2)	(3)	(4)	(5)	(6)
Exposed	-0.026	-0.040	-0.079	-0.012	-0.061	-0.047
	(0.025)	(0.051)	(0.049)	(0.020)	(0.027)	(0.027)
Controls	×	×	×	×	×	×
School District FE	×	×	×	×	×	×
Birth Year FE	×	×	×	×	×	×
Mean College Degree	0.128	0.274	0.302	0.105	0.204	0.208
Number of Treated Individuals	561	281	176	972	631	583
Clusters	460	470	769	297	719	682
Observations	2,309	1,303	2,472	2.950	2,985	2,716

Note: Each column reports coefficients and standard errors (in parentheses) from a two-way fixed effects regression displayed in equation (1). The unit of observation is the individual. The outcome variable is college degree. Exposed, the reported independent variable, defines an individual at a relevant school-going age in a shooting district at the time of the shooting. Column (1) restricts the sample to individuals with poor parental income, column (2) to individuals with well-off parental income, column (3) restricts the sample to white people, column (4) to Black people, column (5) restricts the sample to females and column (6) to males. Included control variables are gender, race, father's employment, father's education, mother's education, marital status of the mother at birth and time since exposure for columns (1) and (2); parental income, gender, father's employment, father's education, mother's education, marital status of the mother at birth and time since exposure for columns (3) and (4), and parental income, race, father's employment, father's education, mother's education, marital status of the mother at birth and time since exposure for columns (5) and (6). Birth-year and school-district fixed effects are included. The mean of College Degree shows the dependent variable's mean for the neighboring group before the shooting. Standard errors are clustered at the school-district level.

Table A29: Effects of School Shootings on Survivors' Labor Force Participation

	Dependent variable:			
	Hours Worked	Unemployed	Self-Employed	Business Income
	(1)	(2)	(3)	(4)
Exposed	-81.461	0.047	-0.024	-308.29
	(46.282)	(0.018)	(0.015)	(241.67)
Controls	×	×	×	×
School District FE	×	×	×	×
Birth Year FE	×	×	×	×
Mean of Dependent Variable	1,836	0.155	0.081	499.934
Number of Treated Individuals	1,214	1,214	1,214	1,214
Clusters	954	954	954	954
Observations	4,649	5,139	5,701	5,701

Note: Each column reports coefficients and standard errors (in parentheses) from a two-way fixed effects regression displayed in equation (1). The unit of observation is the individual. The outcome variables are hours worked, unemployment, self-employed, and business income. Exposed, the reported independent variable, defines an individual at a relevant school-going age in a shooting district at the time of the shooting. Included control variables are parental income, gender, race, father's employment, father's education, mother's education, marital status of the mother at birth, and time since exposure. Birth-year and school-district fixed effects are included. The mean of the dependent variable shows the dependent variables' mean for the neighboring group before the shooting. Standard errors are clustered at the school-district level.

Table A30: Effects of School Shootings on Probability to Move

	Dependent variable:				
	Probability to Move at Age 30				
	(1)	(2)	(3)	(4)	(5)
Exposed	-0.013	-0.008	-0.015	-0.018	0.014
	(0.026)	(0.026)	(0.025)	(0.025)	(0.020)
Individual Controls		×	×	×	×
Father Controls			×	×	×
Mother Controls				×	×
Time since Exposure					×
School District FE	×	×	×	×	×
Birth Year FE	×	×	×	×	×
Mean Probability to Move	0.514	0.514	0.514	0.514	0.514
Number of Treated Individuals	1,214	1,214	1,214	1,214	1,214
Clusters	954	954	954	954	954
Observations	5,701	5,701	5,701	5,701	5,701

Note: Each column reports coefficients and standard errors (in parentheses) from a two-way fixed effects regression displayed in equation (1). The unit of observation is the individual. The outcome variable is the probability of an individual relocating to another school district at age 30. Exposed, the reported independent variable, defines an individual at a relevant school-going age in a shooting district at the time of the shooting. Included control variables are parental income, gender, race, father's employment, father's education, mother's education, marital status of the mother at birth, and time since exposure. Birth-year and school-district fixed effects are included. The mean of Probability to Move shows the dependent variable's mean for the neighboring group before the shooting. Standard errors are clustered at the school-district level.

Table A31: Effects of School Shootings on Probability to Move to a College District

	Dependent variable:				
	Probability to Move to a College District				
	(1)	(2)	(3)	(4)	(5)
Exposed	-0.073	-0.066	-0.065	-0.067	-0.038
	(0.032)	(0.031)	(0.031)	(0.031)	(0.029)
Individual Controls		×	×	×	×
Father Controls			×	×	×
Mother Controls				×	×
Time since Exposure					×
School District FE	×	×	×	×	×
Birth Year FE	×	×	×	×	×
Mean Probability to Move	0.164	0.164	0.164	0.164	0.164
Number of Treated Individuals	2,109	2,109	2,109	2,109	2,109
Clusters	1,179	1,179	1,179	1,179	1,179
Observations	8,611	8,611	8,611	8,611	8,611

Note: Each column reports coefficients and standard errors (in parentheses) from a two-way fixed effects regression displayed in equation (1). The unit of observation is the individual. The outcome variable is the probability of an individual relocating to a college district after high school. A college district is defined as a school district with a college (two or more year institutions) or university (four-year institutions) within its boundaries. Exposed, the reported independent variable, defines an individual at a relevant school-going age in a shooting district at the time of the shooting. Included control variables are parental income, gender, race, father's employment, father's education, mother's education, marital status of the mother at birth, and time since exposure. Birth-year and school-district fixed effects are included. The mean of Probability to Move shows the dependent variable's mean for the neighboring group before the shooting. Standard errors are clustered at the school-district level.

Table A32: Effects of School Shootings on Probability to Move to a University District

	Dependent variable:				
	Probability to Move to a University District				
	(1)	(2)	(3)	(4)	(5)
Exposed	-0.096	-0.089	-0.083	-0.085	-0.059
	(0.031)	(0.031)	(0.031)	(0.031)	(0.029)
Individual Controls		×	×	×	×
Father Controls			×	×	×
Mother Controls				×	×
Time since Exposure					×
School District FE	×	×	×	×	×
Birth Year FE	×	×	×	×	×
Mean Probability to Move	0.078	0.078	0.078	0.078	0.078
Number of Treated Individuals	2,109	2,109	2,109	2,109	2,109
Clusters	1,179	1,179	1,179	1,179	1,179
Observations	8,611	8,611	8,611	8,611	8,611

Note: Each column reports coefficients and standard errors (in parentheses) from a two-way fixed effects regression displayed in equation (1). The unit of observation is the individual. The outcome variable is the probability of an individual relocating to a university district after high school. A university district is defined as a school district with a university within its boundaries. Exposed, the reported independent variable, defines an individual at a relevant school-going age in a shooting district at the time of the shooting. Included control variables are parental income, gender, race, father's employment, father's education, mother's education, marital status of the mother at birth, and time since exposure. Birth-year and school-district fixed effects are included. The mean of Probability to Move shows the dependent variable's mean for the neighboring group before the shooting. Standard errors are clustered at the school district level.

Table A33: Effects of School Shootings on School District Spending

	Dependent variable:					
	Total Expenditures	Education	Instruction	Support Services	Salaries	Instruction Salaries
	(1)	(2)	(3)	(4)	(5)	(6)
Exposed	0.026	0.020	0.015	0.016	0.018	0.005
	(0.015)	(0.014)	(0.014)	(0.017)	(0.013)	(0.014)
Controls	×	×	×	×	×	×
School District FE	×	×	×	×	×	×
Year FE	×	×	×	×	×	×
Mean of Dependent Variable	8919.172	7488.757	4509.56	2664.056	4603.543	3124.403
Number of Treated Districts	6,324	6,324	6,324	6,324	6,324	6,324
Clusters	2,254	2,254	2,254	2,254	2,254	2,254
Observations	65,897	65,897	65,897	65,897	65,897	65,897

Note: Each column reports coefficients and standard errors (in parentheses) from a two-way fixed effects regression displayed in equation (1). The unit of observation is the school district year. The outcome variables are total expenditures, education expenditures, instruction expenditures, support services expenditures, salaries, and instruction salaries. Exposed, the reported independent variable, defines a school district that has experienced a shooting. Control variables are population density, white population ratio, unemployment rate, college-educated population ratio, gender ratio, and median household income. Year and school-district fixed effects are included. The mean of the dependent variable shows the dependent variables' mean for the neighboring group before the shooting. Standard errors are clustered at the school district level.

Table A34: Effects of School Shootings on School District Revenue

	Dependent variable:			
	Total	Federal	State	Local
	(1)	(2)	(3)	(4)
Exposed	0.019	0.191	-0.031	-0.019
	(0.014)	(0.029)	(0.023)	(0.030)
Controls	×	×	×	×
School District FE	×	×	×	×
Year FE	×	×	×	×
Mean of Dependent Variable	8871.846	683.472	4022.403	4165.764
Number of Treated Districts	6,324	6,324	6,324	6,324
Clusters	2,254	2,254	2,254	2,254
Observations	65,897	65,897	65,897	65,897

Note: Each column reports coefficients and standard errors (in parentheses) from a two-way fixed effects regression displayed in equation (1). The unit of observation is the school district year. The outcome variables are total, federal, state, and local revenues. Exposed, the reported independent variable defines a school district that has experienced a shooting. Control variables are population density, white population ratio, unemployment rate, college-educated population ratio, gender ratio, and median household income. Year and school-district fixed effects are included. The mean of the dependent variable shows the dependent variables' mean for the neighboring group before the shooting. Standard errors are clustered at the school district level.

Table A35: Effects of School Shootings on Second Generation Geographic Mobility

	Dependent variable:		
	Probability to Move		
	Higher Median HH Income District	Higher Median HH Income County	Higher Median HH Income State
	(1)	(2)	(3)
Exposed	-0.089	-0.025	-0.021
	(0.010)	(0.011)	(0.020)
Controls	×	×	×
Parent School District FE	×	×	×
Parent Birth Year FE	×	×	×
School District FE	×	×	×
Birth Year FE	×	×	×
Mean of Dependent Variable	0.199	0.165	0.083
Number of Treated Individuals	45	45	45
Clusters	127	127	127
Observations	1,951	1,951	1,951

Note: Each column reports coefficients and standard errors (in parentheses) from a two-way fixed effects regression displayed in equation (1). The unit of observation is the individual. The outcome variables are higher median household income district, higher median household income county, and higher median household income state. Exposed parent, the reported independent variable, defines an individual who has shooting-exposed parents. Included control variables are grandparent income, gender, race, grandfather's employment, grandfather's education, grandmother's education, marital status of grandmother at birth, and time since parent's exposure. Fixed effects are included: parent birth year, parent-school district, and birth year and school district. The mean of the dependent variable shows the dependent variables' mean for the neighboring group before the shooting. Standard errors are clustered at the parent school district level.

Table A36: Effects of School Shootings on Survivors' Children Self-Concept

	Dependent variable:		
	Math Ability	Reading Ability	Global Self-Concept
	(1)	(2)	(3)
Exposed Parent	-0.574	-0.507	-0.630
	(0.183)	(0.207)	(0.185)
Controls	×	×	×
Parent School District FE	×	×	×
Parent Birth Year FE	×	×	×
School District FE	×	×	×
Birth Year FE	×	×	×
Mean of Dependent Variable	3.917	4.285	2.960
Number of Treated Individuals	1,643	1,643	1,643
Clusters	340	340	340
Observations	5,323	5,323	5,323

Note: Each column reports coefficients and standard errors (in parentheses) from a two-way fixed effects regression displayed in equation (1). The unit of observation is the individual. The outcome variables are math ability self-concept, reading ability self-concept, and global self-concept. Exposed parent, the reported independent variable, defines an individual who has shooting-exposed parents. Included control variables are grandparent income, gender, race, grandfather's employment, grandfather's education, grandmother's education, marital status of grandmother at birth, and time since parent's exposure. Fixed effects are included: parent birth year, parent-school district, and birth year and school district. The mean of the dependent variable shows the dependent variables' mean for the neighboring group before the shooting. Standard errors are clustered at the parent school-district level.

Table A37: Effects of School Shootings on Survivors' Children's Future Plans

	Dependent variable:				
	School Aspirations	School Expectations	Talk with Mother	Talk with Father	Talk with Friends
	(1)	(2)	(3)	(4)	(5)
Exposed Parent	-0.342	-0.417	-0.405	-0.305	-0.357
	(0.193)	(0.124)	(0.277)	(0.174)	(0.167)
Controls	×	×	×	×	×
Parent School District FE	×	×	×	×	×
Parent Birth Year FE	×	×	×	×	×
School District FE	×	×	×	×	×
Birth Year FE	×	×	×	×	×
Mean of Dependent Variable	2.629	2.493	2.875	2.577	2.943
Number of Treated Individuals	1,643	1,643	911	911	911
Clusters	340	340	295	295	295
Observations	5,323	5,323	3,140	3,140	3,140

Note: Each column reports coefficients and standard errors (in parentheses) from a two-way fixed effects regression displayed in equation (1). The unit of observation is the individual. The outcome variables are school aspirations, school expectations, talking about the future with their mother, talking about the future with their father, and talking about the future with their friends. Exposed parent, the reported independent variable, defines an individual with shooting-exposed parents. Included control variables are grandparent income, gender, race, grandfather's employment, grandfather's education, grandmother's education, marital status of grandmother at birth, and time since parent's exposure. Fixed effects are included: parent birth year, parent-school district, and birth year and school district. The mean of the dependent variable shows the dependent variables' mean for the neighboring group before the shooting. Standard errors are clustered at the parent school-district level.

Table A38: Effects of School Shootings on Survivors' Children's Earnings

	Dependent variable:				
	Income Distribution				
	Top 10%	Top 25%	Top 50%	Bottom 25%	Bottom 10%
	(1)	(2)	(3)	(4)	(5)
Exposed Parent	-0.028	-0.007	-0.099	0.115	0.170
	(0.020)	(0.026)	(0.019)	(0.015)	(0.019)
Controls	×	×	×	×	×
Parent School District FE	×	×	×	×	×
Parent Birth Year FE	×	×	×	×	×
School District FE	×	×	×	×	×
Birth Year FE	×	×	×	×	×
Mean Percentile	0.100	0.250	0.500	0.250	0.100
Number of Treated Individuals	45	45	45	45	45
Clusters	127	127	127	127	127
Observations	1,951	1,951	1,951	1,951	1,951

Note: Each column reports coefficients and standard errors (in parentheses) from a two-way fixed effects regression displayed in equation (1). The unit of observation is the individual. The outcome variables are the probability of reaching the top 10%, top 25%, top 50% or staying at the bottom 25% and bottom 10% of the income distribution. Exposed parent, the reported independent variable, defines an individual who has shooting-exposed parents. Included control variables are grandparent income, gender, race, grandfather's employment, grandfather's education, grandmother's education, marital status of grandmother at birth, and time since parent's exposure. Fixed effects are included: parent birth year, parent-school district, and birth year and school district. The mean of the dependent variable shows the dependent variables' mean for the neighboring group before the shooting. Standard errors are clustered at the parent school district level.

B Supplementary Data

B.1 School District Finance Survey

I compiled school district spending and revenue data from the Common Core of Data (CCD) and the Historical Database on Individual Government Finances (INDFIN). INDFIN contains school district finance data annually for a subsample of school districts from 1967 and 1970 through 1991. The CCD School District Finance Survey provides the rest of the data, from 1991 to today, for all school districts in the United States. I merge these to get a data set on school district finances from 1967-2019.

I use the spending and revenue variables common in both data sets, namely, the total revenue of the school district in a given year; total federal, state, and

local revenues in that year. The total revenue of a school district is the sum of federal, state, and local funding. Federal funding, accounting for about 10 percent of total school district revenues, targets mostly low-income student groups. Local funding largely comes from local property taxes. State funding is based on specific variables according to a formula and is less likely to adjust to district-specific shocks such as school shootings.

On the spending side, the variables are total expenditures of a school district in a given year; total current expenditures for elementary and secondary education; total current expenditures on instruction; total current expenditures on support services; total staff salaries; and salaries of instruction staff in that year. Total current expenditures for elementary and secondary education is the sum of total current expenditures on instruction, total current expenditures on support services, and total current expenditures on other elementary and secondary education.

B.2 Decennial Census Data

Census data on the United States population is collected by the United States Census Bureau every ten years, in years ending in zero. I obtain variables on population estimates, median household income, per capita income, number of people living in poverty, and other demographics such as race, sex, and age. The data is reported at the tract level (larger than census blocks) and includes every Census from 1970 to 2010. I further calculate population density from these variables. I aggregate the aforementioned variables to the school-district level according to the land area share of a tract on the district it occupies and merge with the school district finance survey using the crosswalk created by Chetty et al. (2018).[38]

[38] I use the crosswalk from Chetty et al. (2018) Table 9: Neighborhood Characteristics by Census Tract. The crosswalk identifies each census tract by state, county, and tract (2010 FIPS) and provides corresponding school-district identifiers. The codebook for Table 9 can be found at https://opportunityinsights.org/wp-content/uploads/2019/07/Codebook-for-Table-9.pdf.

C Explanation of Variables

C.1 Dependent Variables

Alcohol Consumption: Alcohol consumption is a dummy variable that takes the value 1 if the individual ever drinks any alcoholic beverages such as beer, wine, or liquor, and 0 otherwise. This variable is obtained from the PSID and available for the years 1999-2019.

Antidepressant Consumption: Antidepressant consumption is a dummy variable that takes the value of 1 if the individual is taking tranquilizers, antidepressants or pills for nerves, and 0 otherwise. This variable is obtained from the PSID and available for the years 2011-2019.

Armed: Armed variable is derived from the occupation variable in the PSID. Occupation is a nominal variable that takes values between 10 and 9,999 (in the latest wave) with different occupation categories corresponding to different value ranges. The occupations covered in this variable management occupations; business and financial operations occupations; computer and mathematical occupations; architecture and engineering occupations; life, physical and social science occupations; community and social services occupations; legal occupations; education, training and library occupations; arts, design, entertainment, sports and media occupations; healthcare practitioners and technical occupations; healthcare support occupations; protective service occupations; food preparation and serving related occupations; building and grounds cleaning and maintenance occupations; personal care and service occupations, sales and related occupations; office and administrative support occupations; farming, fishing and forestry occupations; construction and extraction occupations; installation, maintenance, and repair occupations; production occupations; transportation and material moving occupations; military specific occupations and unemployed. This variable is obtained from the PSID and available for the years 1968-2019. Armed is a dummy variable that takes the value 1 if the individual had an occupation in military or protective services and 0 otherwise.

BMI: Body Mass Index is calculated according to the following formula: BMI = (Weight in pounds / (Height in inches) x (Height in inches)) x 703. Weight in pound and height in inches are obtained from the PSID and available for the years 1999-2019.

Business Income: Business income is a continuous variable that takes values between -999,997 and 19,999,994. It is the sum of labor part of business income and asset part of business income from unincorporated businesses. This variable is obtained from the PSID and available for the years 1970-2019.

College Degree: College degree dummy takes the value 1 if the individual has a college degree, in other words, if they have more than 16 years of completed education, and 0 otherwise. This variable is obtained from the PSID and available for the years 1968-2019.

Community: Community variable is derived from the occupation variable in the PSID. This variable is obtained from the PSID and available for the years 1968-2019. Community is a dummy variable that takes the value 1 if the individual had an occupation in social work and 0 otherwise.

Creative: Creative variable is derived from the occupation variable in the PSID. This variable is obtained from the PSID and available for the years 1968-2019. Creative is a dummy variable that takes the value 1 if the individual had an occupation in arts and sports, computer, engineering or media and 0 otherwise.

Education: Education is a continuous variable that represents the education expenditures of a school district in a year. Education represents the total current expenditures for elementary/secondary education and is the sum of total current instruction expenditures, total current support services expenditures, and total current other elementary/secondary expenditures. This variable is

obtained from the CCD and the INDFIN and available for the years 1967-2020.

Family Size: Family size is a numeric variable that represents the actual number of persons in the family unit. It takes values between 1 to 20. House value is obtained from the PSID and available for the years 1968-2019.

Federal Revenue: Federal revenue is a continuous variable that represents the total federal revenue of a school district in a year. Federal revenue is the sum of individuals with disabilities education act, math, science and teacher quality, safe and drug free schools, vocational and tech education, bilingual education, child nutrition act, impact aid and Indian education. This variable is obtained from the CCD and the INDFIN and available for the years 1967-2020.

Global Self-Concept: Global self-concept is a continuous variable that takes values between 1 and 5. Global self-concept represents the individual's global self-concept scale score. The lowest value reflects the lowest global self-concept and vice versa. This variable is obtained from the PSID child development supplement and available for the years 1997, 2002, 2007, and 2014.

Health Status: Health status is an ordered variable that takes the values 1, 2, 3, 4 and 5 where 1 corresponds to poor, 2 to fair, 3 to good, 4 to very good and 5 to excellent health. This variable is obtained from the PSID and available for the years 1986-2019.

Higher Median Household Income County: Higher median household income county is a dummy variable that takes the value 1 if the individual has moved to a county that has a higher median household income than the individual's original residential county and 0 otherwise. Median household income variable for each county is obtained from the decennial census.

Higher Median Household Income District: Higher median household income district is a dummy variable that takes the value 1 if the individual has

moved to a school district that has a higher median household income than the individual's original residential school district and 0 otherwise. Median household income variable for each tract is obtained from the decennial census and aggregated to the school-district level according to the land area share of a tract on the school district it occupies obtained from the tract to school district crosswalk by Chetty et al. (2018).

Higher Median Household Income County (Children): Higher median household income county is a dummy variable that takes the value 1 if the individual is born in a county that has a higher median household income than the individual's parent's original residential county (during their study) and 0 otherwise. Median household income variable for each county is obtained from the decennial census.

Higher Median Household Income State (Children): Higher median household income state is a dummy variable that takes the value 1 if the individual is born in a state that has a higher median household income than the individual's parent's original residential state (during their study) and 0 otherwise. Median household income variable for each state is obtained from the decennial census.

Higher Median Household Income District (Children): Higher median household income district is a dummy variable that takes the value 1 if the individual is born in a school district that has a higher median household income than the individual's parent's original residential school district (during their study) and 0 otherwise. Median household income variable for each tract is obtained from the decennial census and aggregated to the school-district level according to the land area share of a tract on the school district it occupies obtained from the tract to school district crosswalk by Chetty et al. (2018).

Higher Median Household Income State: Higher median household income state is a dummy variable that takes the value 1 if the individual has

moved to a state that has a higher median household income than the individual's original residential state and 0 otherwise. Median household income variable for each state is obtained from the decennial census.

High School Degree: High school degree dummy takes the value 1 if the individual has a high school degree, in other words, if they have more than 12 years of completed education, and 0 otherwise. This variable is obtained from the PSID and available for the years 1968-2019.

Hourly Earnings: Hourly earnings is a numeric variable that represents the hourly earnings of an individual. It is the ratio of total labor income to hours worked in a year. Total labor income is the sum of labor, farm, business, and asset incomes. Labor income represents the individual's earnings from wages or salaries and takes values between 0 and 9,999,997. Farm income represents the individual's earnings from farming and takes the values between -999,997 and 9,999,99. Business income represents the individual's earnings from the labor part of business income from unincorporated businesses and takes the values between 0 and 9,999,997. Asset income represents the individual's earnings from the asset part of business income from unincorporated businesses and takes the values between -999,997 and - 9,999,997. Hours worked represent the total annual work hours of the individuals. It takes the values between 0 and 5,824. This variable is obtained from the PSID and is available for the years 1968-2019.

Hours Worked: Hours worked is a continuous variable that takes values between 1 and 5,824. The values for this variable represent individual's total annual work hours on all jobs including overtime the last year. This variable is obtained from the PSID and available for the years 1968-2019.

House Ownership: House ownership is a dummy variable that takes the value of 1 if the individual owns a house, and 0 otherwise. This dummy variable is derived from the variable above (house value). House value is obtained

from the PSID and available for the years 1968-2019.

House Value: House value is a numeric variable that represents the present value of the individual in dollars. It may take values between 0 and 9,999,996. If the answer of the individual to this question is 0, this means that the individual does not own a house. This variable is obtained from the PSID and available for the years 1968-2019.

Income Distribution: Income distribution is an interval variable that represents the individual's location in income distribution. Income distribution is calculated by first ordering the hourly earnings (at age 30) of individuals in the PSID data, then ranking the orders and finally creating dummy variables for top 1 percent, top 5 percent, top 10 percent, top 15 percent, top 20 percent, top 25 percent, top 30 percent, top 35 percent, top 40 percent, top 45 percent, top 50 percent, bottom 45 percent, bottom 40 percent, bottom 35 percent, bottom 30 percent, bottom 25 percent, bottom 20 percent, bottom 15 percent, bottom 10 percent, bottom 5 percent and bottom 1 percent according to the rankings.

Instruction: Instruction is a continuous variable that represents the instruction expenditures of a school district in a year. Instruction represents the total current instruction expenditures. This variable is obtained from the CCD and the INDFIN and available for the years 1967-2020.

Instruction Salaries: Instruction salaries is a continuous variable that represents the salary expenditures of a school district on instruction in a year. Instruction salaries represent the salaries spent on instruction. This variable is obtained from the CCD and the INDFIN and available for the years 1967-2020.

Land Area: Land area is a continuous variable that represents the total land area that a school district covers. I use the crosswalk from Chetty et al. (2018) Table 9: Neighborhood Characteristics by Census Tract. The crosswalk iden-

tifies each census tract by state, county, and tract (2010 FIPS) and provides corresponding school district identifiers. Census tract and school district definitions are from 2010. I aggregate the land area (that is given at tract level) to the school-district level.

Life Satisfaction: Life satisfaction is an ordered variable that takes the values 1, 2, 3, 4 and 5 where 1 corresponds to completely satisfied, 2 to very satisfied, 3 to somewhat satisfied, 4 to not very satisfied and 5 to not at all satisfied. This variable is obtained from the PSID and available for the years 2009-2019.

Local Revenue: Local revenue is a continuous variable that represents the total local revenue of a school district in a year. Local revenue is the sum of parent government contributions, property taxes, general sales taxes, public utility taxes, individual and corporate income taxes, tuition fees from pupils and parents, transportation fees, school lunch, textbook sales, district activity receipts, student fees, other sales and services, rents and royalties, sale of property, interest earnings, fines and forfeits, private contributions, and National Center for Education Statistics local revenue and Census Bureau State Revenue. This variable is obtained from the CCD and the INDFIN and available for the years 1967-2020.

Math Ability: Math ability is a continuous variable that takes values between 1 and 7. Math ability represents the individual's ability self-concept in math score. It is the average of math skill gen rate, math skill in context of peers, math skill compared to other skills, achievements in math in the past year, learning something new in math, difficulty in math, usefulness of math, importance of math, interest in math, and interest in math scores. The lowest value reflects the worst math ability and vice versa. This variable is obtained from the PSID child development supplement and available for the years 1997, 2002, 2007, and 2014.

Non-College: Non-college variable is derived from the occupation variable in the PSID. This variable is obtained from the PSID and available for the years 1968-2019. Non-college is a dummy variable that takes the value 1 if the individual belongs to one of the occupation categories that arguably does not require a college degree, namely, admin support, construction, farming, repair and maintenance, production, cleaning and maintenance, food service or personal care, and 0 otherwise.

Psychological Problems: Psychological problems is a dummy variable that takes the value of 1 if the individual were ever diagnosed with any emotional, nervous or psychiatric problems, and 0 otherwise. This variable is obtained from the PSID and available for the years 2005-2019.

Reading Ability: Reading ability is a continuous variable that takes values between 1 and 7. Reading ability represents the individual's ability self-concept in reading score. It is the average of reading skill gen rate, reading skill in context of peers, reading skill compared to other skills, achievements in reading in the past year, learning something new in reading, difficulty in reading, usefulness of reading, importance of reading, interest in reading, and interest in reading scores. The lowest value reflects the worst reading ability and vice versa. This variable is obtained from the PSID child development supplement and available for the years 1997, 2002, 2007, and 2014.

Salaries: Salaries is a continuous variable that represents the salary expenditures of a school district in a year. Salaries represent the total salaries that is the sum of instruction salaries, support services salaries and food services salaries. This variable is obtained from the CCD and the INDFIN and available for the years 1967-2020.

School Aspirations: School aspirations is a nominal variable that takes values between 1 and 8 where 1 corresponds to leave high school before graduation, 2 corresponds to graduate from high school, 3 corresponds to graduate

from a 2-year community college, 4 corresponds to graduate from a vocational school, 5 corresponds to attend a 4-year college, 6 corresponds to graduate from a 4-year college, 7 corresponds to get more than 4 years of college and 8 corresponds to do something else. School aspirations variable represents how far the individual would like to go in their education. This variable is obtained from the PSID child development supplement and available for the years 2002, 2007, and 2014.

School Expectations: School expectations is a nominal variable that takes values between 1 and 8 where 1 corresponds to leave high school before graduation, 2 corresponds to graduate from high school, 3 corresponds to graduate from a 2-year community college, 4 corresponds to graduate from a vocational school, 5 corresponds to attend a 4-year college, 6 corresponds to graduate from a 4-year college, 7 corresponds to get more than 4 years of college and 8 corresponds to do something else. School expectations variable represents how far the individual would like to go in their education. This variable is obtained from the PSID child development supplement and available for the years 2002, 2007, and 2014.

Self-Employed: Self-employed is a dummy variable that takes the value 1 if the individual is self-employed and 0 otherwise. This variable is obtained from the PSID and available for the years 1968-2019.

Service: Service variable is derived from the occupation variable in the PSID. This variable is obtained from the PSID and available for the years 1968-2019. Service is a dummy variable that takes the value 1 if the individual had an occupation in transportation, sales occupations, personal care, food service or cleaning and maintenance, and 0 otherwise.

Smoking: Smoking is a dummy variable that takes the value 1 if the individual smokes cigarettes and 0 otherwise. This variable is obtained from the PSID and available for the years 1999-2019.

State Revenue: State revenue is a continuous variable that represents the total state revenue of a school district in a year. State revenue is the sum of general formula assistance, staff improvement programs, special education programs, compensatory and basic skills programs, bilingual education programs, gifted and talented programs, vocational education programs, school lunch programs, capital outlay and debt services programs, and transportation programs. This variable is obtained from the CCD and the INDFIN and available for the years 1967-2020.

Support Services: Support services is a continuous variable that represents the expenditures of a school district on support services in a year. Support services represents the total current support services expenditures. This variable is obtained from the CCD and the INDFIN and available for the years 1967-2020.

Talk with Father: Talk with father is a nominal variable that takes values between 1 and 6 where 1 corresponds to not in the last month, 2 corresponds to once or twice, 3 corresponds to about once a week, 4 corresponds to about two or three days a week, 5 corresponds to almost every day and 6 corresponds to every day. Talk with father represents how often the individual talks with their father about their plans for their future education and work. This variable is obtained from the PSID child development supplement and available for the years 2002 and 2007.

Talk with Friends: Talk with friends is a nominal variable that takes values between 1 and 6 where 1 corresponds to not in the last month, 2 corresponds to once or twice, 3 corresponds to about once a week, 4 corresponds to about two or three days a week, 5 corresponds to almost every day and 6 corresponds to every day. Talk with friends represents how often the individual talks with their friends about their plans for their future education and work. This variable is obtained from the PSID child development supplement and available

for the years 2002 and 2007.

Talk with Mother: Talk with mother is a nominal variable that takes values between 1 and 6 where 1 corresponds to not in the last month, 2 corresponds to once or twice, 3 corresponds to about once a week, 4 corresponds to about two or three days a week, 5 corresponds to almost every day and 6 corresponds to every day. Talk with mother represents how often the individual talks with their mother about their plans for their future education and work. This variable is obtained from the PSID child development supplement and available for the years 2002 and 2007.

Teacher: Teacher variable is derived from the occupation variable in the PSID. This variable is obtained from the PSID and available for the years 1968-2019. Teacher is a dummy variable that takes the value 1 if the individual had an occupation in education and 0 otherwise. Teacher category includes preschool teacher, elementary school teacher, secondary school teacher and special education teacher.

Top 10 percent Median Household Income County: Higher median household income county is a dummy variable that takes the value 1 if the individual has moved to a county that is in the top 10 percent of the income distribution and 0 otherwise. Median household income variable for each county is obtained from the decennial census.

Top 10 percent Median Household Income District: Higher median household income district is a dummy variable that takes the value 1 if the individual has moved to a school district that is in the top 10 percent of the income distribution and 0 otherwise. Median household income variable for each tract is obtained from the decennial census and aggregated to the school-district level according to the land area share of a tract on the school district it occupies obtained from the tract to school district crosswalk by Chetty et al. (2018).

Top 10 percent Median Household Income State: Higher median household income state is a dummy variable that takes the value 1 if the individual has moved to a state that is in the top 10 percent of the income distribution and 0 otherwise. Median household income variable for each state is obtained from the decennial census.

Total Expenditures: Total expenditures is a continuous variable that represents the total expenditures of a school district in a year. Total expenditures is the sum of total current expenditures of elementary/secondary education, total non-elementary/secondary expenditures, total capital outlay expenditures, payments to state governments, payments to local governments, payments to other school systems, interest on debt, payments to private schools and payments to charter schools. This variable is obtained from the CCD and the INDFIN and available for the years 1967-2020.

Total Revenue: Total revenues is a continuous variable that represents the total revenues of a school district in a year. Total revenues is the sum of total federal revenue, total state revenue and total local revenue. This variable is obtained from the CCD and the INDFIN and available for the years 1967-2020.

Unemployed: Unemployed is a dummy variable that takes the value 1 if the individual is unemployed and 0 otherwise. This variable is obtained from the PSID and available for the years 1968-2019.

Weeks Vacation: Weeks vacation is a numeric variable that represents the actual number of reported weeks of vacation or time off taken by the individual. It takes values between 0 to 52. A 0 means that the individual did not report any vacation in terms of weeks; did not work for money in the last year; took no vacation or time off. This variable is obtained from the PSID and available for the years 2003-2019.

Years of Schooling: Years of completed education variable represent the

actual grade of school completed; e.g., a value of 08 indicates that this individual completed the eighth grade by the time of the interview. It takes values between 0 and 17. This variable is obtained from the PSID and available for the years 1968-2019.

C.2 Control Variables

Father's Education: Father's education is a nominal variable that takes values between 1 and 8 where value 1 corresponds to 0-5 grades, 2 corresponds to 6-8 grades, 3 corresponds to 9-11 grades, 4 corresponds to 12 grades (completed high school), 5 corresponds to 12 grades plus nonacademic training, 6 corresponds to 13-14 years (some college), 7 corresponds to 15-16 years (college BA) and 8 corresponds to 17 years (graduate work). The variable represents the level of education that an individual's father completed. This variable is obtained from the PSID and available for the years 1968-2019.

Father's Employment: Father's employment is a nominal variable that takes values between 10 and 9,999 (in the latest wave) with different occupation categories corresponding to different value ranges. The occupations covered in this variable management occupations; business and financial operations occupations; computer and mathematical occupations; architecture and engineering occupations; life, physical and social science occupations; community and social services occupations; legal occupations; education, training and library occupations; arts, design, entertainment, sports and media occupations; healthcare practitioners and technical occupations; healthcare support occupations; protective service occupations; food preparation and serving related occupations; building and grounds cleaning and maintenance occupations; personal care and service occupations, sales and related occupations; office and administrative support occupations; farming, fishing and forestry occupations; construction and extraction occupations; installation, maintenance, and repair occupations; production occupations; transportation and

material moving occupations; military specific occupations and unemployed. The variable represents the individual's father's usual occupation when they were growing up. This variable is obtained from the PSID and available for the years 1968-2019.

Gender: Gender is a nominal variable that takes the value 1 if the individual is male and 2 if the individual is female. This variable is obtained from the PSID and available for the years 1968-2019.

Grandfather's Education: Analogous to father's education, grandfather's education is a nominal variable that takes values between 1 and 8 where value 1 corresponds to 0-5 grades, 2 corresponds to 6-8 grades, 3 corresponds to 9-11 grades, 4 corresponds to 12 grades (completed high school), 5 corresponds to 12 grades plus nonacademic training, 6 corresponds to 13-14 years (some college), 7 corresponds to 15-16 years (college BA) and 8 corresponds to 17 years (graduate work). It is the same variable as father's education however this time the value corresponding to the individual's grandfather is used. The variable represents the level of education that an individual's grandfather completed. This variable is obtained from the PSID and available for the years 1968-2019.

Grandfather's Employment: Analogous to father's employment, grandfather's employment is a nominal variable that takes values between 10 and 9,999 (in the latest wave) with different occupation categories corresponding to different value ranges. It is the same variable as father's employment however this time the value corresponding to the individual's grandfather is used. The variable represents the individual's grandfather's usual occupation when their parent was growing up. This variable is obtained from the PSID and available for the years 1968-2019.

Grandmother's Education: Analogous to mother's education, grandmother's education is a nominal variable that takes values between 1 and 8 where value

1 corresponds to 0-5 grades, 2 corresponds to 6-8 grades, 3 corresponds to 9-11 grades, 4 corresponds to 12 grades (completed high school), 5 corresponds to 12 grades plus nonacademic training, 6 corresponds to 13-14 years (some college), 7 corresponds to 15-16 years (college BA) and 8 corresponds to 17 years (graduate work). It is the same variable as mother's education however this time the value corresponding to the individual's grandmother is used. The variable represents the level of education that an individual's grandmother completed. This variable is obtained from the PSID and available for the years 1974-2019.

Marital Status of Grandmother at Birth: Analogous to marital status of mother at birth, marital status of grandmother at birth is a nominal variable that takes values between 1 and 9 where 1 corresponds to married, 2 corresponds to never married, 3 corresponds to widowed, 4 corresponds to divorced, 5 corresponds to separated, 7 corresponds to other, 8 and 9 correspond to NA. The variable represents the marital status of grandmother at the time of individual's parent's birth. This variable is obtained from the PSID and available for the years 1985-2019.

Marital Status of Mother at Birth: Marital status of mother at birth is a nominal variable that takes values between 1 and 9 where 1 corresponds to married, 2 corresponds to never married, 3 corresponds to widowed, 4 corresponds to divorced, 5 corresponds to separated, 7 corresponds to other, 8 and 9 correspond to NA. The variable represents the marital status of mother at the time of individual's birth. This variable is obtained from the PSID and available for the years 1985-2019.

Mother's Education: Mother's education is a nominal variable that takes values between 1 and 8 where value 1 corresponds to 0-5 grades, 2 corresponds to 6-8 grades, 3 corresponds to 9-11 grades, 4 corresponds to 12 grades (completed high school), 5 corresponds to 12 grades plus nonacademic training, 6 corresponds to 13-14 years (some college), 7 corresponds to 15-16 years (college

BA) and 8 corresponds to 17 years (graduate work). The variable represents the level of education that an individual's mother completed. This variable is obtained from the PSID and available for the years 1974-2019.

Parent Income: Parent income is a nominal variable that takes values 1, 3, and 5 where 1 corresponds to poor, 3 to average, and 5 to pretty well-off. It represents the economic situation of the individual's parents when they were growing up. This variable is obtained from the PSID and is available for the years 1968-2019.

Race: Race is a nominal variable that takes values between 1 and 7. The value 1 corresponds to white, 2 corresponds to Black, 3 corresponds to American Indian or Alaska Native, 4 corresponds to Asian, 5 corresponds to Native Hawaiian or Pacific Islander and 7 corresponds to other races. This variable is obtained from the PSID and available for the years 1968-2019.

Time since Exposure: Time since exposure is a continuous variable that measures the number of years that have passed between the shooting year and the year that individual is at age 30. For the individuals that are in pre-shooting period (pre-exposed in shooting districts and pre-exposed in neighboring districts) it can take negative values. This is on purpose not set to zero as to not assume a functional form on the variable.