The Effects of Police Violence on Inner-City Students

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Abstract

- The paper documents racially disparate effects of **officer-involved killings** occur on the educational and psychological well-being of Los Angeles public high school students.
  - In the United States, there occurs nearly 1,000 officer-involved killings.
- Exploits hyperlocal variation in how close students live to a killing.
- Results: Exposure to police violence leads to
  - persistent decreases in GPA
  - increased incidence of emotional disturbance
  - lower rates of high school completion and college enrollment.
- These effects are driven entirely by black and Hispanic students in response to
  - police killings of other minorities
  - incidents involving unarmed individuals

Section 1

Introduction

Literature

- Police use of force
  - are excercised to protect civilians from imminent harm
  - linked to unfavorable attitudes toward law enforcement.
    - Large urban riots in recent U.S. history were all triggered by acts of police violence (DiPasquale and Glaeser, 1998)
    - Lifetime odds of being killed by police of racial minorities are as high as 1 in 1,000 (Skolnick and Fyfe 1993; Weitzer and Tuch 2004; Brunson and Miller 2005).
- Little causal evidence of the social effects on local communities
  - Police violence is correlated with homicide and poverty rates (Kania and Mckey 1977; Jacobs, 1998)
  - Exploiting larger social movement may not be representative (Sigelman et al., 1997; Desmond, Papachristos, and Kirk, 2016; Gershenson and Hayes, 2018).

Dataset and Summary of the Results

- This paper estimates the short- and long-run effects of police killings on high school students.
  - Teenagers face crucial educational decisions
  - Even vicarious police contact can influence on shaping long-run beliefs and institutional trust (Winfree and Griffith 1977; Leiber, Nalla, and Farnworth 1998; Hurst and Frank 2000; Tyler, Fagan, and Geller 2014)
- Novel Datasets
  - Incident-level data on the universe of officer-involved killings in Los Angeles County (2002-2016)
  - Individual-level panel data for all high school students enrolled in the Los Angeles Unified School District (LAUSD)
- The author calculates each student's geographic proximity to police violence.
- Dynamic DID design.

Summary of Results

- The effects are driven entirely by black and Hispanic students in response to police killings of other underrepresented minorities
- Short-run Negative spillovers
  - Effects are largest for students who lived closest to the event, and dissipate beyond .50 miles.
  - GPA: decrease by 0.08 s.d. for several semesters: each hitting affects more than 300 students.
  - emotional disturbance: 15% more likely to be classified with PTSD and depression.
- Long-run effect: students exposed to officer-involved killings in the 9th grade
  - 3.5% less likely to graduate from high school.
  - 2.5% less likely to enroll college.

  Though smaller in magnitude, effects remain significant in exposure in the 10th and 11th grades.

Contribution

1. Large externalities of police killings
   - Each officer-involved killing caused three students of color to drop out.
   - Aggressive policing can socially cost more (Davis, Whyde, and Langton, 2018).
   - Less extreme uses of force are salient to local residents (Brunson and Miller, 2005; Brunson, 2007; Legewie and Fagan, 2019)
   - They may be excercised in a racially biased manner (Fryer 2019).
2. Self-fulfilling prophecies: minorities believe that police discriminate in use of force (Pew Research Center 2016, 2019; AP-NORC 2015; Dawson, Brown, and Jackson 2019)
   - education (Carlana 2019), labor markets (Glover, Pallais, and Pariente 2017), and health care (Alsan and Wanamaker 2018)
   - Empirical evidence of racial bias is mixed (Nix et al. 2017; Fryer 2019; Johnson et al. 2019; Knox, Lowe, and Mummolo 2020; Knox and Mummolo 2020)

3. Measuring short-run impacts of criminal violence on children (Sharkey, 2010; Sharkey et al., 2012, 2014; Beland and Kim, 2016; Rossin-Slater et al., 2019; Carrell and Hoekstra, 2010; Monteiro and Rocha, 2017; Gershenson and Tekin, 2018)
   - Unlike others forms of violence, violence to enforce laws improves public outcomes.
   - The findings will serve important inputs for pressing policy discussions around police oversight and officer use of force.
4. Link between neighborhoods and economic mobility (Katz, Kling, and Liebman 2001; Chetty, Hendren, and Katz 2016)
   - Intergenerational mobility differs dramatically between blacks and whites: Chetty et al. (2020)
   - Results suggest that law enforcement may play an important role in explaining this racial disparity

Section 2

Background and Data

Los Anageles, California

- A natural setting for the research.
- Today, Los Angeles experiences more police killings than any other county in the nation.
  - From Jjuly 2002 to June 2016, 627 officer-involved fatalities occurred (twice as that in New York or Chicago)
- two of the most high-profile acts of police violence in U.S. history
  - 1965, a 21-year-old African American: 34 deaths and more than 3,000 arrests
  - 1992, a 26-year-old black man: 63 deaths, more than 12,000 arrests, and $1 billion damage in properties.

Police Killings

- Unique incident-level data on police killings
  - From the *Los Angeles Times* Homicide Database
  - records the followings of all deaths in the county by a "human hand".
    - about the deceased: name, age, and race
    - about the event: exact address and date
  - contextual details are supplemented by Los Angeles County district attorney incident reports and other sources.
    - investigative evidence and officer and witness testimonies
    - legal analysis of officer actions.
  - Contextual information for 556 killings.
    - whether a weapon was recovered from the deceased
    - if so, what type (Knife, Gun)
    - whether the deceased had fired his weapon
- In many cases, police actions were predicated on faulty or misreported information

Student Data

- LAUSD administrative data
  - Individual-level records for all high school students in the district from the 2002-2003 to 2015-2016 academic years
  - 712,954 unique students (anonymized).
  - demographic information:
    - race
    - date of birth
    - parental education
    - home language
    - free/subsidized lunch status
    - proficiency on eighth-grade standardized tests
  - Each student's last reported home address while enrolled at LAUSD

- Measures of academic achievement: observed for grades 9th through 12th
  - Semester GPA: average grades in math, science, English, and social sciences
  - Daily attendance ('09-'10 and onward)
  - high school graduation: high school diploma or equivalent (GED or CHSPE) or a Special Education Certificate of Completion
  - college enrollment: whether students enrolled in postsecondary schooling for those who graduated from LAUSD between 2009 and 2014
- Mental health
  - "emotionally disturbed": certified learning disability that "cannot be explained by intellectual, sensory or health factors" (2004 school year onward)
  - School Experience Survey (SES): 2014-2015 and 2015-2016 academic years.
    - three questions examining feelings of school and neighborhood safety.

TABLE I

SUMMARY STATISTICS

Panel A: Police killings				Panel B: Students				
		Black/	White/				>0.5 mi.	
	All	Hispanic	Asian		All	⩽0.5 mi.	Area	Nonarea
	Deceased demographics				Student demographics			
Black	0.26	0.33	0.00	Black	0.12	0.11	0.12	0.12
Hispanic	0.52	0.67	0.00	Hispanic	0.74	0.82	0.80	0.70
White	0.19	0.00	0.83	White	0.08	0.03	0.03	0.10
Asian	0.03	0.00	0.14	Asian	0.06	0.04	0.04	0.08
Male	0.97	0.97	0.96	Male	0.50	0.50	0.49	0.50
Age	32.3	30.6	38.0	Proficient (8th)	0.43	0.40	0.35	0.46
	Newspaper mentions				Household characteristics			
Any	0.22	0.22	0.21	Free lunch	0.69	0.77	0.72	0.66
Total	1.48	1.66	0.88	English lang.	0.29	0.23	0.25	0.32
Median (if any)	2.00	2.00	2.00	College+	0.08	0.06	0.05	0.09

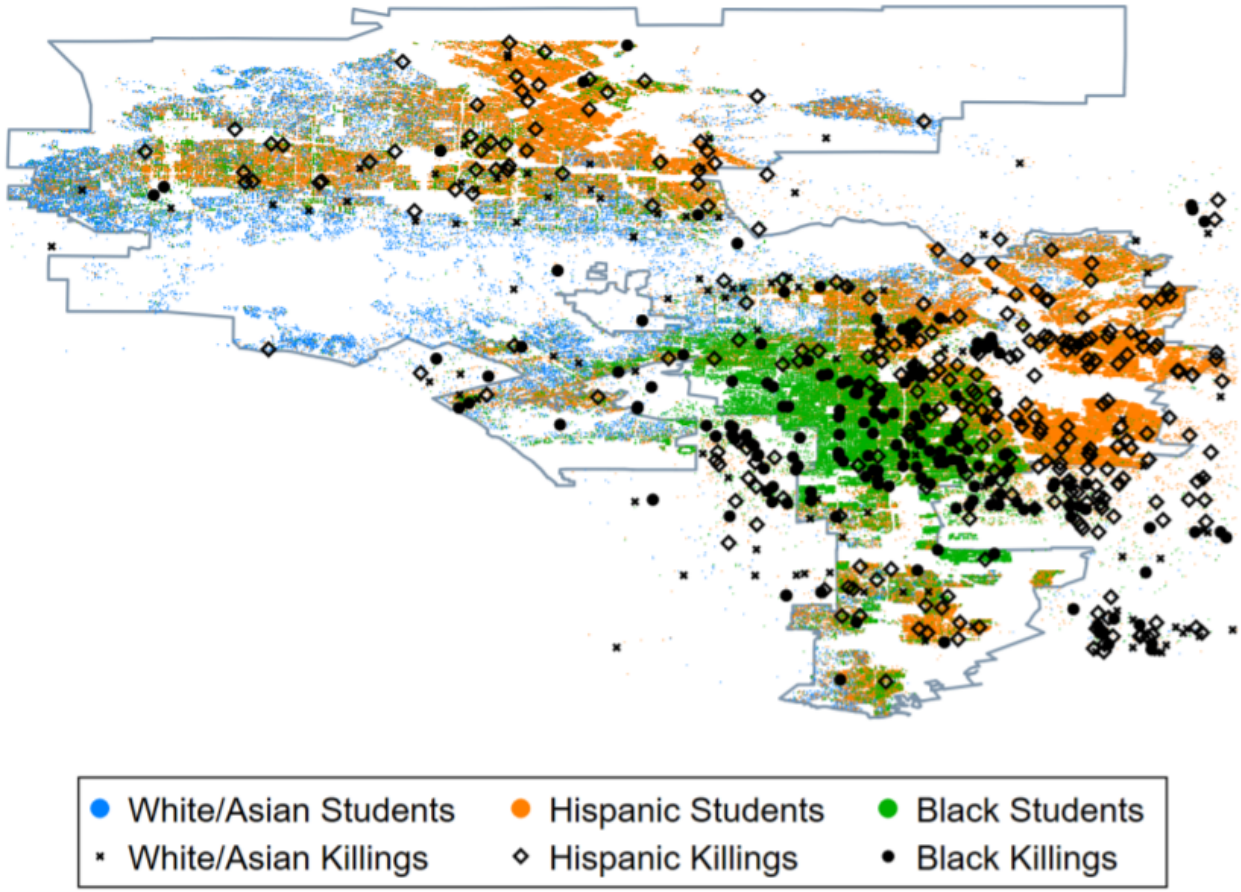
TABLE I

(CONTINUED)

Panel A: Police killings				Panel B: Students				
		Black/	White/				>0.5 mi.	
	All	Hispanic	Asian		All	⩽0.5 mi.	Area	Nonarea
	Weapon type							
Unarmed	0.17	0.17	0.20					
Knife	0.29	0.25	0.44					
Gun	0.54	0.58	0.36					
Fired (if gun)	0.41	0.42	0.33					
Incidents	627	486	141	Students	712,954	141,628	133,758	437,568

Notes. Panel A provides summary statistics for the full police killings data and separately for killings of blacks and Hispanics and killings of whites and Asians. Unless otherwise noted, mean values are reported. Newspaper mentions come from a search of each incident by the name of the deceased in six local newspapers (the *Los Angeles Times*, the *Los Angeles Daily News*, *Pasadena Star News*, *San Gabriel Valley Tribune*, *Torrance Daily Breeze*, and *Whittier Daily News*). *Any* is an indicator for whether the incident was mentioned in any article, *Total* is the number of articles mentioning the incident. *Median* is the median number of articles in each race category, conditional on being mentioned. *Weapon type* is only available for incidents for which I was able to obtain contextual information from District Attorney reports or other sources (556 out of 627 incidents). *Unarmed* refers to killings of individuals who did not have a weapon, *Gun* refers to individuals with firearms (including BB guns and replicas), and *Knife* refers to individuals with any other type of weapon. *Fired (if gun)* is the share of gun-wielding individuals who fired their weapon. Panel B provides summary statistics for the student sample, disaggregated by those who lived near/far from a killing during their LAUSD tenure. Students whose home address was more than 0.50 miles from a killing are further grouped based on whether they lived in a census block group where at least one other student in their cohort lived within 0.50 miles of a killing (*Area*) or in a census block group where no other students in their cohort lived within 0.50 miles of a killing (*Nonarea*). *Proficient (8th)* is an indicator for whether the student's average eighth-grade California Standards Test scores were at a "basic" or higher level of proficiency. *Free lunch* is an indicator for free/subsidized lunch qualification, *English language* is an indicator for students from English-speaking households, *College+* is an indicator for whether a student's parent has a college degree or higher.

Figure A.I: Map of Student Residences and Police Killings



Section 3

Identification Strategy

Exposure to Police Killings

- The primary obstacle to identification: correlation with neighborhood characteristics.
  - police killings may be more likely to occur where poverty and crime are.
- To deal with this problem, the author exploit hyperlocal variation in exposure to killings.
  - comparing changes over time among students who lived very close (.50 miles) to a police killing to students who lived slightly farther away
    - Killings are quite rare and difficult to predict.
    - Underreported nature of officer-invoked killings (20% of media coverage)
- Grahpical evidence shows that incidents affect absenteeism of only the students (Chetty et al. 2018, 28).

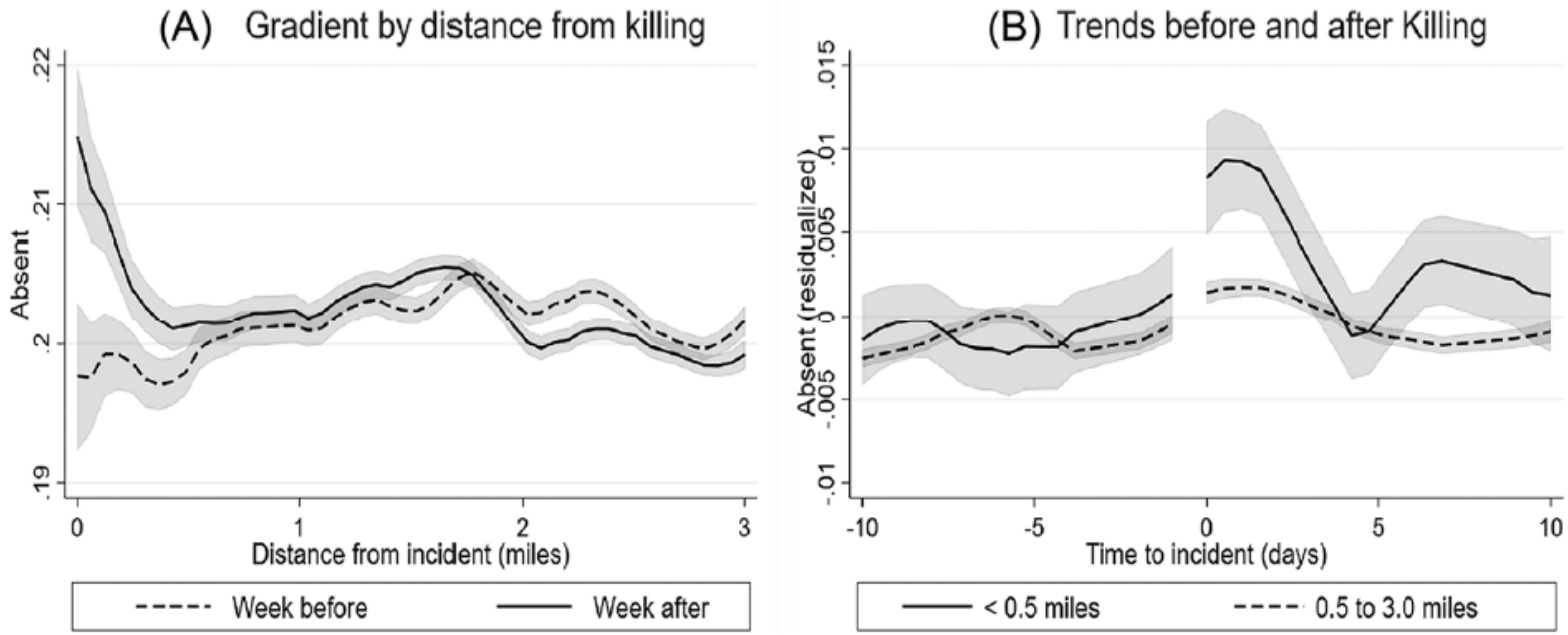


FIGURE I

Effects on Absenteeism

- the full sample includes more than 600 incidents spread across 15 years and thousands of square miles

Estimating Equation

- Semester GPA: for individual i at semester t (cohort c, neiborhood n),

$$y_{i,t} = \delta_i + \lambda_{n,t} + \omega_{c,t} + \sum_{\tau=-7}^{7} \beta_\tau Shoot_\tau + \epsilon_{i,t}$$

  - $\delta_i, \lambda_{n,t}, \omega_{c,t}$: individual, neighborhood-semester, and cohort-year fixed effects, respectively.
  - $Shoot_\tau$: relative time to treatment. Baseline: $\tau = -1$.
  - Treatment is defined by the earliest nearby killing if he or she faced multiple ones during high school.
- Treatment
  - On average, this captures 303 students per incident.
  - Roughly 20% of the sample is ever-treated based on this definition.

Section 4

Main Results

Academic Performance

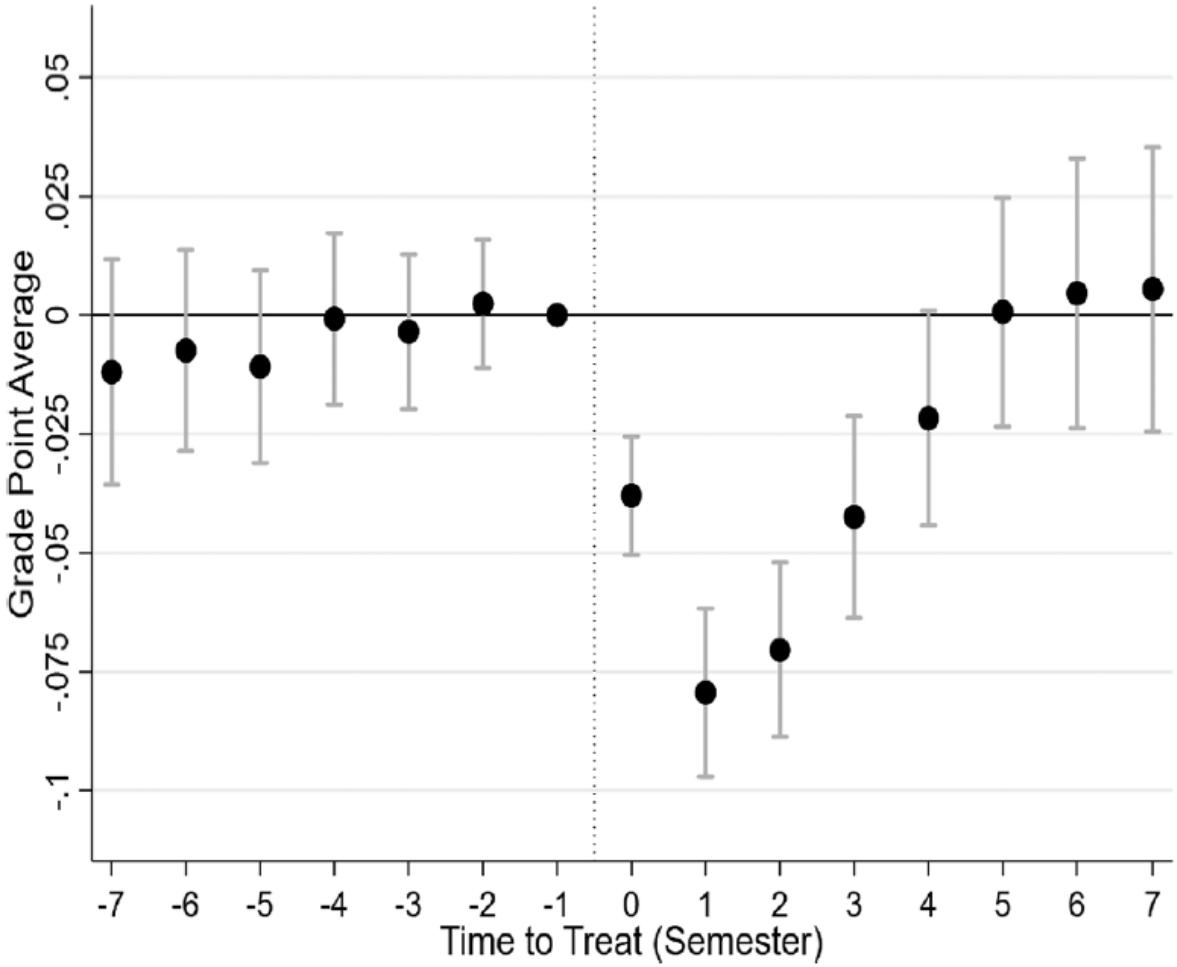


FIGURE II

Effects on GPA

- Prior to shootings, I find little evidence of differential group trends.
  - Pretreatment estimates are also jointly insignificant ($F = 0.69, p = .655$).
- GPA declines by 0.04 points in the semester of the shooting and by between 0.07 and 0.08 points in the following two semesters (GPA mean = 2.08, std. dev. = 1)
  - Effects then gradually dissipate (reach insignificance five semesters after exposure).
- the mean posttreatment estimate of -0.030 std. dev.
  - larger in absolute magnitude than the average impact of randomized interventions (Fryer 2017)
    - providing student incentives: -0.024 s.d.
    - low-dosage tutoring: 0.015 s.d.
    - choice and vouchers: 0.024 s.d.
  - 1.3 percentage point decrease in the graduation rate

Psychological Well-Being

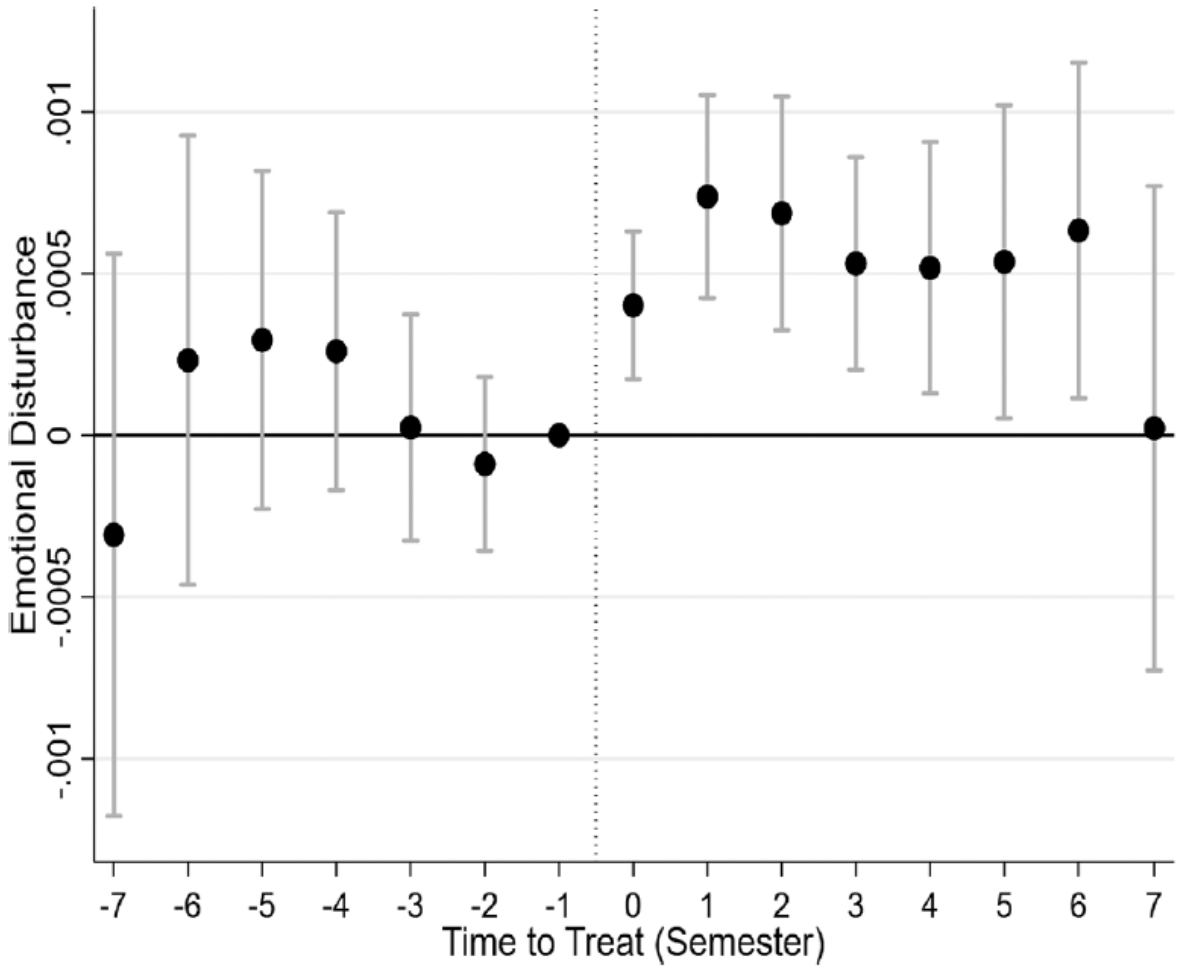


FIGURE III

Effects on Emotional Disturbance

- little evidence of differential pretrends between treatment and control students (F-test of joint significance: $F = 1.15, p = .334$)
- Though the treatment estimates are small, ranging from 0.04 to 0.07 percentage points.
- Changes in emotional disturbance are also highly persistent after exposure.
  - ED and psychological trauma are chronic conditions and often last for several years after the inciting incident (Famularo et al. 1996; Friedman et al. 1996)
  - ED designations are sticky.

Robustness

TABLE II

EFFECTS ON GPA AND EMOTIONAL DISTURBANCE

	Base	Alt. controls		Alt. neighborhood		Alt. sample	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: DV = grade point average							
Treat × Post	−0.027***	−0.027***	−0.029***	−0.019***	−0.029***	−0.021***	−0.029***
	(0.006)	(0.006)	(0.010)	(0.005)	(0.007)	(0.006)	(0.007)
Obs.	4,166,188	4,166,188	1,815,131	4,173,300	4,157,829	4,005,642	3,778,162
Panel B: DV = emotional disturbance (per 1,000 students)							
Treat × Post	0.470***	0.470***	0.637***	0.382***	0.428***	0.481***	0.469***
	(0.127)	(0.127)	(0.216)	(0.115)	(0.125)	(0.148)	(0.124)
Obs.	4,029,073	4,029,073	1,876,183	4,029,436	4,028,739	3,867,867	3,768,180
Neighborhood	Blk grp	Blk grp	Blk grp	Tract	Grid	Blk grp	Blk grp
Homicides	—	Y	Y	Y	Y	Y	Y
Crime, arrests	—	—	Y	—	—	—	—
Exclude	—	—	<2010	—	—	Multi-treaters	New 10–12 graders

Notes. The table shows results from estimating equation (1), replacing time to treatment indicators with a single posttreatment dummy. Treatment is defined as students living within 0.50 miles of a police killing during high school. Control students are those whose nearest killing during high school was between 0.50 and 3 miles away. Panel A examines noncumulative, semester GPA (mean = 2.08). Sample includes student-semester panel data for students enrolled in LAUSD high schools from the 2002–2003 academic year to the 2015–2016 academic year. Panel B examines emotional disturbance per 1,000 students (mean = 5) and is restricted to the 2003–2004 school year onward, the period for which emotional disturbance information is available. Column (1) presents my base specification controlling for time trends at the census block group level. Column (2) introduces controls for criminal homicides in a block-semester. Column (3) adds controls for the number of crimes and arrests in a block-semester (this information is only available from 2010 onward). Column (4) controls for neighborhood-semester effects at the census tract level, as opposed to census block group level (there are roughly 2.6 block groups per tract). Column (5) instead controls for neighborhood using arbitrary square mile units derived from dividing Los Angeles into a grid. Observation numbers change across alternative neighborhood specifications due to singletons being dropped. Column (6) excludes treatment students who were exposed to multiple police killings. Column (7) excludes students who entered LAUSD in the 10th to 12th grades.

Additional Robustness Checks

Figure A.VII: Effects on GPA: Permutation Tests

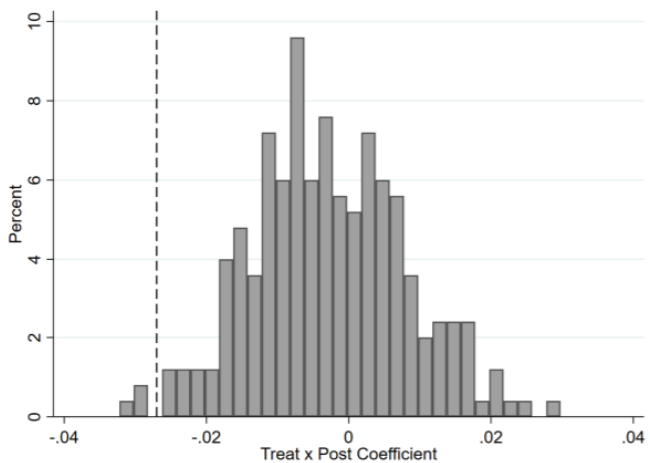
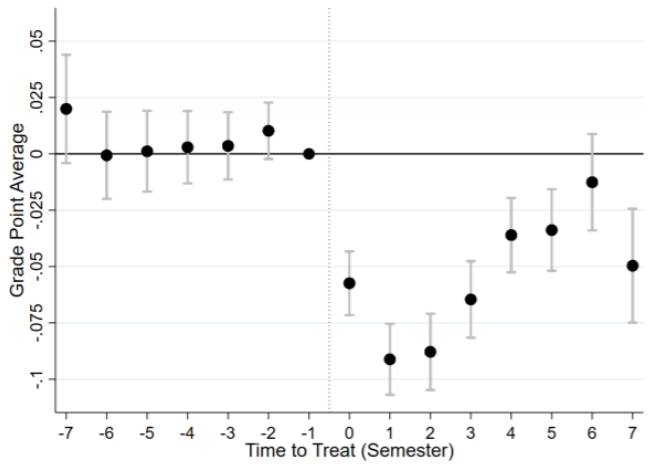


Figure A.VIII: Effects on GPA: Staggered Treatment Correction



Notes: Figure shows effects on semester GPA (mean=2.08) after correcting for staggered treatment timing per Callaway and Sant'Anna (2019). For each treatment cohort (defined by the semester a student is first exposed to a police killing), I estimate Equation 1 against the control group of never-treaters. Standard errors are clustered by zip code. Students treated in the first semester of the sample (i.e., Fall 2002-2003) are dropped from the analysis, as there is no pre-period for that cohort. I then average the time to treatment coefficients across treatment cohorts, weighting by the number of students in each cohort-relative semester. This procedure ensures non-negative weights and addresses potential contamination due to treatment effect heterogeneity across cohorts. Dotted vertical line represents time of treatment.

Section 5

Mechanism

Racial Differences

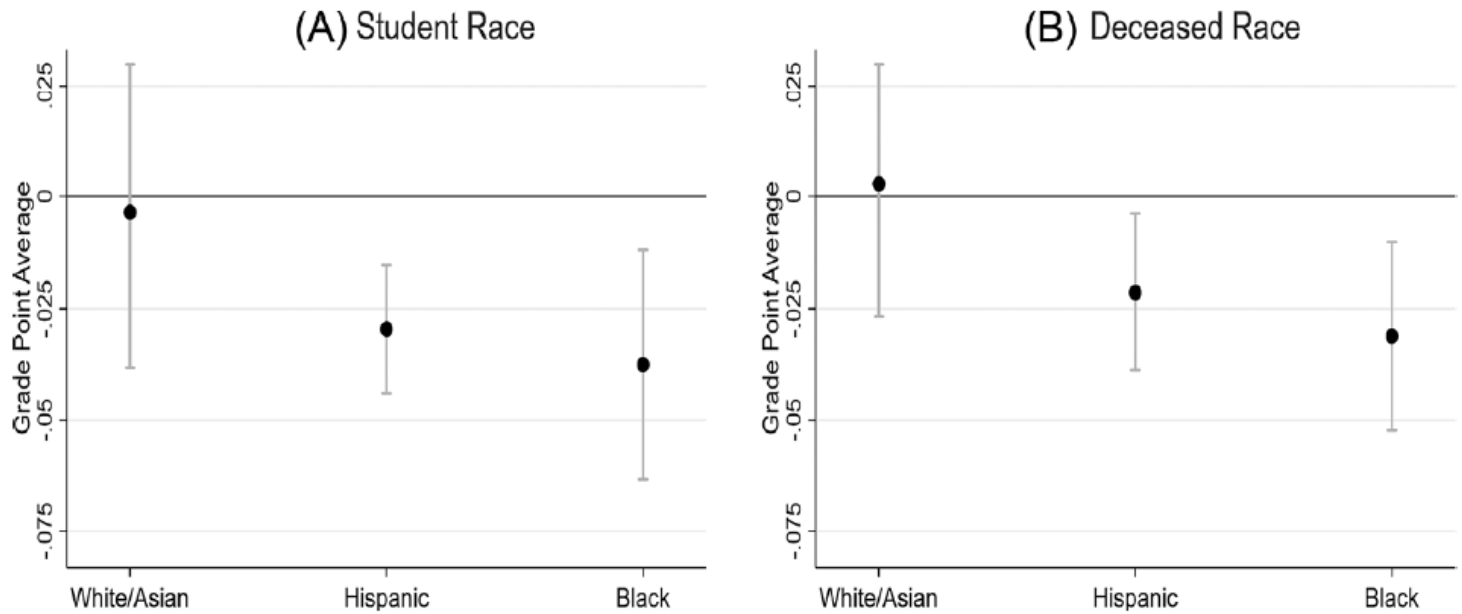


FIGURE IV

Effects on GPA by Race

TABLE III

EFFECTS ON GPA BY RACE OF THE DECEASED

	All students				Black/Hispanic students			
Avg. treatment effect	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Black/Hispanic killing	−0.028***	−0.031***	−0.030***	−0.030***	−0.031***	−0.034***	−0.033***	−0.033***
	(0.007)	(0.007)	(0.006)	(0.006)	(0.008)	(0.007)	(0.007)	(0.007)
White/Asian killing	−0.005	−0.008	−0.007	−0.007	−0.005	−0.011	−0.010	−0.010
	(0.012)	(0.013)	(0.013)	(0.013)	(0.014)	(0.014)	(0.015)	(0.015)
$\beta_{BH} - \beta_{WA}$	−0.023	−0.023	−0.023	−0.023	−0.026	−0.023	−0.023	−0.023
$p(\beta_{BH} = \beta_{WA})$	.132	.131	.131	.134	.142	.184	.184	.179
Area characteristics	—	Y	Y	Y	—	Y	Y	Y
Media, residence	—	—	Y	Y	—	—	Y	Y
Deceased demo.	—	—	—	Y	—	—	—	Y
Observations	4,166,168	4,166,168	4,166,168	4,166,168	3,590,169	3,590,169	3,590,169	3,590,169
R-squared	0.695	0.695	0.695	0.695	0.677	0.677	0.677	0.677

Notes. The table shows average treatment effects for black/Hispanic and white/Asian killings from estimating equation (2) on semester GPA (mean = 2.08). Treatment defined as students living within 0.50 miles of a police killing during high school. Control students are those whose nearest killing during high school was between 0.50 and 3 miles away. Sample includes student-semester panel data for students enrolled in LAUSD high schools from the 2002–2003 academic year to the 2015–2016 academic year. Treatment effects computed at the sample median of each area, incident, and individual factor. Area characteristics include population density, average income, homicide rate, and percent nonwhite in a student's block group. *Media* coverage is an indicator for whether the incident was reported in local newspapers (median = 0). *Residence* is an indicator for whether the incident occurred in or directly outside of the deceased's home (median = 0). Individual demographics include age (median = 33) and gender (median = male) of the deceased. Left side examines all students, right side restricts analysis to black and Hispanic students.

Weapon Type

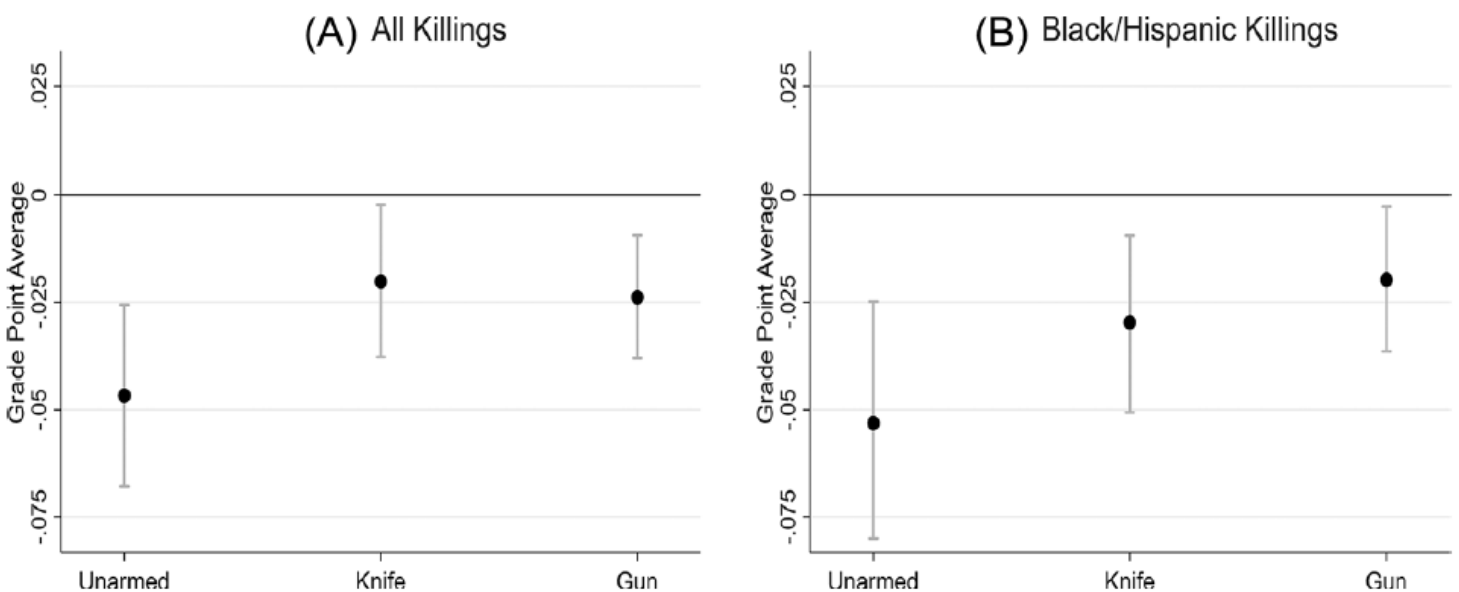


FIGURE V

Effects on GPA by Weapon Type

Comparing Police and Criminal Violence

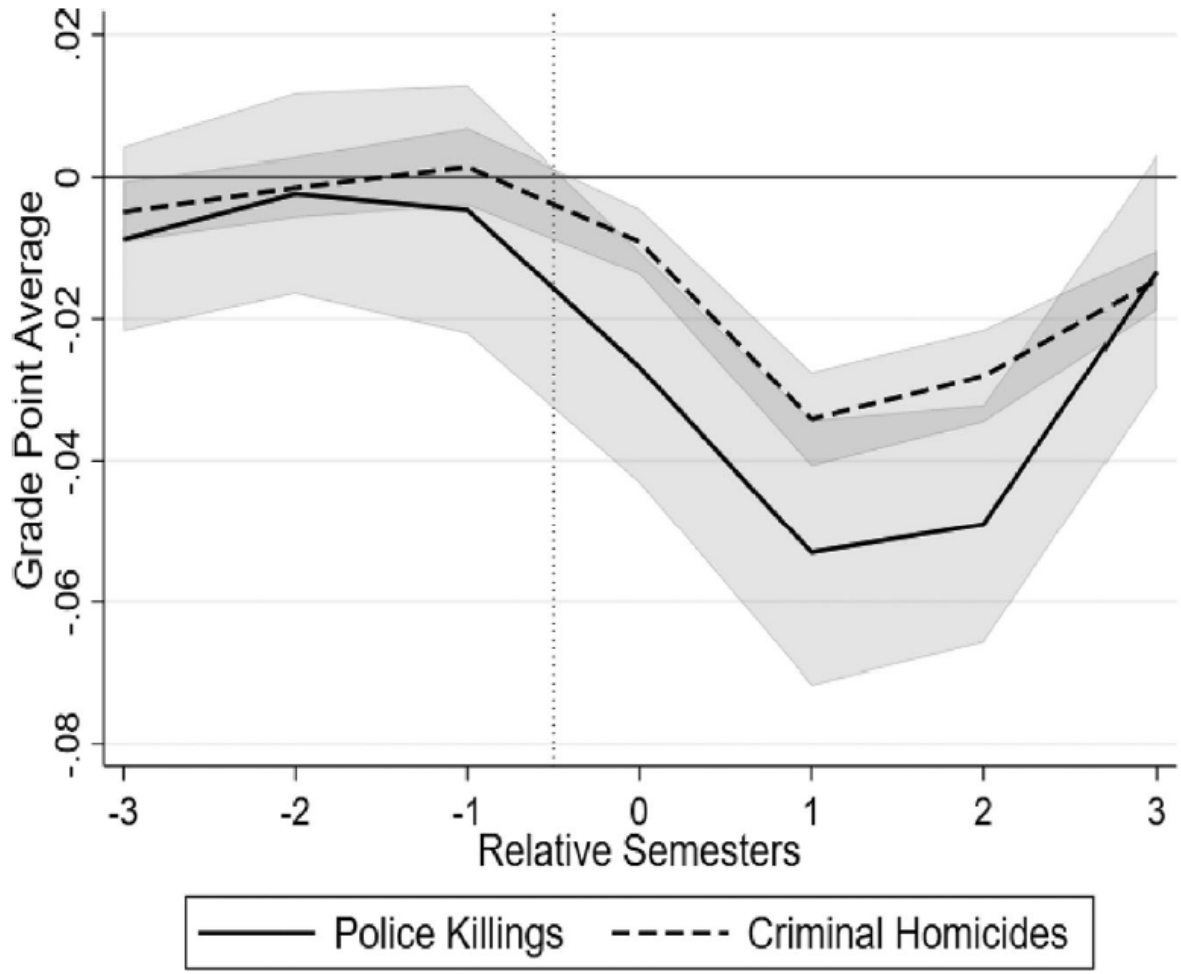


FIGURE VI

Effects on GPA of Police and Criminal Killings

Section 6

Long-Run Effects

Identification

- For student i of expected grade g,

$$y_{i,g} = \delta_{n,c} + \sum_{\tau=9}^{16} \beta_\tau Shoot_{i,g} \times Grade_\tau + \lambda Shoot_{i,g} + \mathbf{X}_i\gamma + \epsilon_{i,g}$$