Exhibit 4

Volume 1 of 2

DECLARATION OF LOUIS KLAREVAS

I, Louis Klarevas, declare:

1. I have been asked by the Defendants to prepare an expert Declaration addressing the relationship between assault weapons, large-capacity magazines (LCMs), and mass shootings, including how restrictions on assault weapons and LCMs impact mass shooting violence. This Declaration is based on my own personal knowledge and experience, and, if I am called as a witness, I could and would testify competently to the truth of the matters discussed in this Declaration ("Declaration" hereinafter).

PROFESSIONAL QUALIFICATIONS

2. I am a security policy analyst and, currently, Research Professor at Teachers College, Columbia University, in New York. I am also the author of the book *Rampage Nation*, one of the most comprehensive studies on gun massacres in the United States.[1]

3. I am a political scientist by training, with a B.A. from the University of Pennsylvania and a Ph.D. from American University. My current research examines the nexus between American public safety and gun violence, including serving as an investigator in a study funded by the National Institutes of Health that is focused on reducing intentional shootings at elementary and secondary schools.

4. During the course of my 20-year career as an academic, I have served on the faculties of the George Washington University, the City University of New York, New York University, and the University of Massachusetts. I have also served as a Defense Analysis Research Fellow at the London School of Economics and Political Science and as United States Senior Fulbright Scholar in Security Studies at the University of Macedonia.

5. In addition to having made well over 100 media and public-speaking appearances, I am the author or co-author of more than 20 scholarly articles and over 70 commentary pieces. In 2019, my peer-reviewed article on the effectiveness of restrictions on LCMs in reducing high-

[1] Louis Klarevas, Rampage Nation: Securing America from Mass Shootings (2016).

fatality mass shootings resulting in six or more victims killed was published in the *American Journal of Public Health*.[2] This study found that jurisdictions with LCM bans experienced substantially lower gun massacre incidence and fatality rates when compared to jurisdictions not subject to similar bans. Despite being over 3 years old now, this study continues to be one of the highest impact studies in academia. It was recently referred to as "the perfect gun policy study," in part due to the study's "robustness and quality."[3]

6. In the past four years (since January 1, 2019), I have been deposed, testified in court, or testified by declaration in the following cases: *Duncan v. Becerra*, United States District Court for the Southern District of California, Case Number 17-cv-1017-BEN-JLB; *Miller v. Bonta*, Case No. 3:19-cv-1537-BEN-JBS, United States District Court for the Southern District of California; *Jones v. Bonta*, United States District Court for the Southern District of California, Case Number 19-cv-01226-L-AHG; *Nguyen v. Bonta*, Case No. 3:20-cv-02470-WQH-MDD, United States District Court for the Southern District of California; *Rupp v. Bonta*, United States District Court for the Eastern District of California, Case Number 17-cv-00903-WBS-KJN; *Brumback v. Ferguson*, United States District Court for the Eastern District of Washington, Case Number 22-cv-03093-MKD; *National Association for Gun Rights v. Highland Park*, United States District Court for the Northern District of Illinois, Case Number 22-cv-04774; *National Association for Gun Rights v. Campbell*, United States District Court for the District of Massachusetts, Case Number 22-cv-11431-FDS; *National Association for Gun Rights*

[2] Louis Klarevas, et al., "The Effect of Large-Capacity Magazine Bans on High-Fatality Mass Shootings," 109 *American Journal of Public Health* 1754 (2019), *available at* https://ajph.aphapublications.org/doi/full/10.2105/AJPH.2019.305311 (last accessed February 11, 2023).

[3] Lori Ann Post and Maryann Mason, "The Perfect Gun Policy Study in a Not So Perfect Storm," 112 *American Journal of Public Health* 1707 (2022), *available at* https://ajph.aphapublications.org/doi/full/10.2105/AJPH.2022.307120 (last accessed February 11, 2023). According to Post and Mason, "Klarevas et al. employed a sophisticated modeling and research design that was more rigorous than designs used in observational studies. Also, they illustrated the analytic steps they took to rule out alternative interpretations and triangulate their findings, for example examining both state bans and federal bans. They helped build the foundation for future studies while overcoming the limitations of previous research." *Ibid.*

v. Lamont, United States District Court for the District of Connecticut, Case No. 3:22-cv-01118-JBA; and *Oregon Firearms Federation v. Kotek*, United States District Court for the District of Oregon, Case No. 2:22-cv-01815-IM. This latter case includes three additional consolidated cases: *Fitz v. Rosenblum*, United States District Court for the District of Oregon, Case No. 3:22-cv-01859-IM; *Eyre v. Rosenblum*, United States District Court for the District of Oregon, Case No. 3:22-cv-01862-IM; and *Azzopardi v. Rosenblum*, United States District Court for the District of Oregon, Case No. 3:22-cv-01869-IM.

7. In 2021, I was retained by the Government of Canada in the following cases which involved challenges to Canada's regulation of certain categories of firearms: *Parker and K.K.S. Tactical Supplies Ltd. v. Attorney General of Canada*, Federal Court, Court File No.: T-569-20; *Canadian Coalition for Firearm Rights, et al. v. Attorney General of Canada*, Federal Court, Court File No.: T-577-20; *Hipwell v. Attorney General of Canada*, Federal Court, Court File No.: T-581-20; *Doherty, et al. v. Attorney General of Canada*, Federal Court, Court File No.: T-677-20; *Generoux, et al. v. Attorney General of Canada*, Federal Court, Court File No.: T-735-20; and *Eichenberg, et al. v. Attorney General of Canada*, Federal Court, Court File No.: T-905-20. I testified under oath in a consolidated court proceeding involving all six cases in the Federal Court of Canada.

8. A true and correct copy of my current curriculum vitae is attached as **Exhibit A** to this Declaration.

9. I have been retained by the Office of the Attorney General of Illinois to provide expert testimony in litigation challenging various aspects of Illinois Public Act 102-1116, also known as the Protect Illinois Communities Act. As of the date of this Declaration, the scope of my engagement includes providing expert testimony in the following cases: *Harrel v. Raoul*, Case No. 23-cv-141-SPM (S.D. Ill.); *Langley v. Kelly*, Case No. 23-cv-192-NJR (S.D. Ill.); *Barnett v. Raoul*, 23-cv-209-RJD (S.D. Ill.); *Federal Firearms Licensees of Illinois v. Pritzker*, 23-cv-215-NJR (S.D. Ill.); and *Herrera v. Raoul*, 23-cv-532 (N.D. Ill.). I have reviewed the provisions of Public Act 102-1116 being challenged in this case. I am being

compensated at a rate of $480/hour for my work on this Declaration, $600/hour for any testimony in connection with this matter, and $120/hour for travel required to provide testimony.

OPINIONS

10. It is my professional opinion, based upon my extensive review and analysis of the data, that (1) in terms of individual acts of intentional criminal violence, mass shootings presently pose the deadliest threat to the safety of American society in the post-9/11 era, and the problem is growing nationwide; (2) high-fatality mass shootings involving assault weapons and/or LCMs, on average, have resulted in a substantially larger loss of life than similar incidents that did not involve assault weapons and/or LCMs; (3) mass shootings resulting in double-digit fatalities are relatively modern phenomena in American history, largely related to the use of assault weapons and LCMs; (4) assault weapons are used by private citizens with a far greater frequency to perpetrate mass shootings than to stop mass shootings; (5) handguns, as opposed to rifles (let alone rifles that qualify as assault weapons), are the most commonly owned firearms in the United States; and (6) states that restrict both assault weapons and LCMs experience fewer high-fatality mass shooting incidents and fatalities, per capita, than states that do not restrict assault weapons and LCMs. Based on these findings, it is my opinion that restrictions on assault weapons and LCMs have the potential to save lives by reducing the frequency and lethality of gun massacres.[4]

[4] For purposes of this Declaration, mass shootings are defined in a manner consistent with my book *Rampage Nation*, *supra* note 1 (*see* Excerpt Attached as **Exhibit B**). "Mass shootings" are shootings resulting in four or more victims being shot (fatally or non-fatally), regardless of location or underlying motive. As a subset of mass shootings, "high-fatality mass shootings" (also referred to as "gun massacres") are defined as shootings resulting in 6 or more victims being shot to death, regardless of location or underlying motive. The data on high-fatality mass shootings is from a data set that I maintain and continuously update. This data set is reproduced in **Exhibit C**. Unless stated otherwise, all of the data used to perform original analyses and to construct tables and figures in Sections I, II, and VI of this Declaration are drawn from **Exhibit C**.

I. MASS SHOOTINGS ARE A GROWING THREAT TO PUBLIC SAFETY

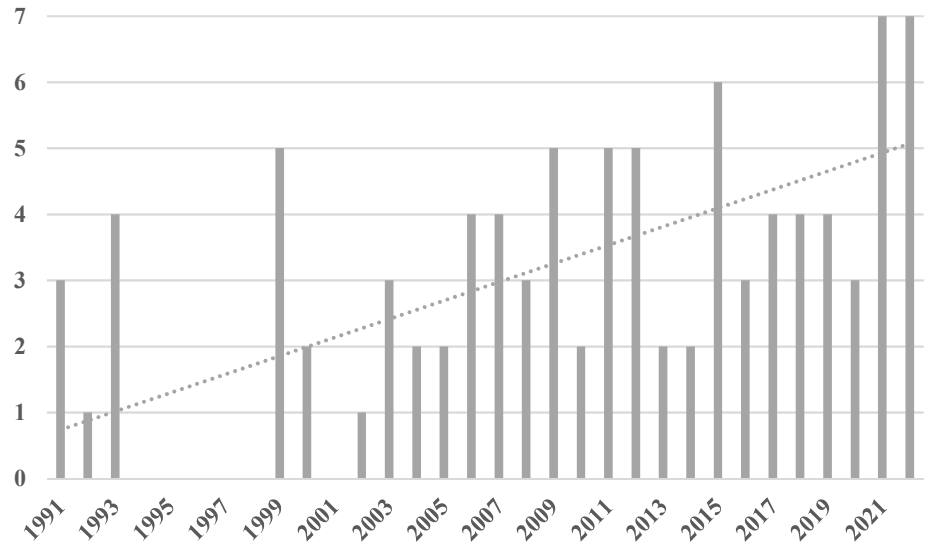
11. Examining mass-casualty acts of violence in the United States since 1991 points to two disturbing patterns.[5] First, as demonstrated in Table 1, the deadliest individual acts of intentional criminal violence in the United States since the terrorist attack of September 11, 2001, have all been mass shootings. Second, as displayed in Figures 1-2, the problem of high-fatality mass shooting violence is on the rise. To put the increase over the last three decades into perspective, between the 1990s and the 2010s, the average population of the United States increased approximately 20%. However, when the number of people killed in high-fatality mass shootings in the 1990s is compared to the number killed in such incidents in the 2010s, it reflects an increase of 260%. In other words, the rise in mass shooting violence has far outpaced the rise in national population—by a factor of 13. The obvious takeaway from these patterns and trends is that mass shootings pose a significant—and growing—threat to American public safety.

Table 1. The Deadliest Acts of Intentional Criminal Violence in the U.S. since 9/11

	Deaths	Date	Location	Type of Violence
1	60	October 1, 2017	Las Vegas, NV	Mass Shooting
2	49	June 12, 2016	Orlando, FL	Mass Shooting
3	32	April 16, 2007	Blacksburg, VA	Mass Shooting
4	27	December 14, 2012	Newtown, CT	Mass Shooting
5	25	November 5, 2017	Sutherland Springs, TX	Mass Shooting
6	23	August 3, 2019	El Paso, TX	Mass Shooting
7	21	May 24, 2022	Uvalde, TX	Mass Shooting

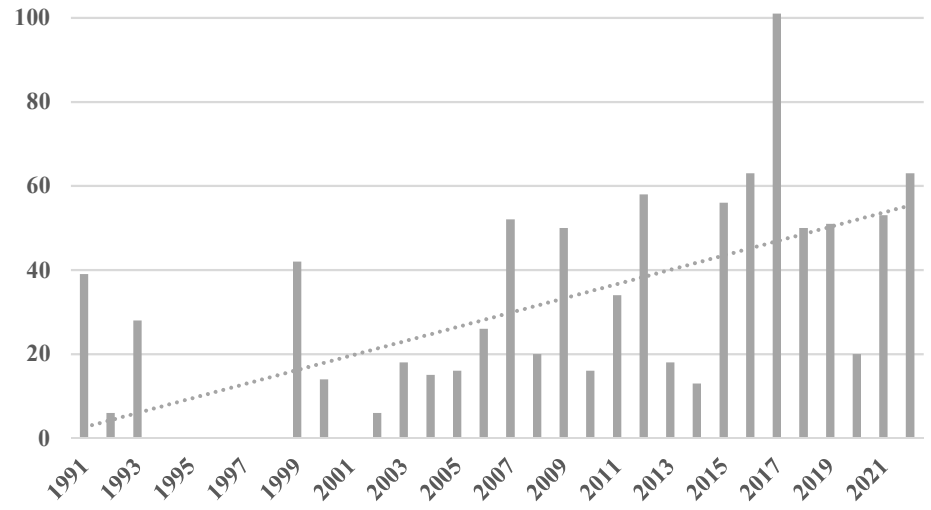
[5] Because the analysis in Section VI of this Declaration necessarily uses data from 1991 through 2022, for purposes of consistency (and to avoid any confusion), the analyses in Sections I and II also use data from 1991 through 2022.

Figure 1. Annual Trends in High-Fatality Mass Shooting Incidents, 1991-2022



Note: The dotted line is a linear trendline. A linear trendline is a straight line that captures the overall pattern of the individual data points. When there is a positive relationship between the x-axis and y-axis variables, the trendline moves upwards from left to right. When there is a negative relationship between the x-axis and y-axis variables, the trendline moves downwards from left to right.

Figure 2. Annual Trends in High-Fatality Mass Shooting Fatalities, 1991-2022



Note: The dotted line is a linear trendline. A linear trendline is a straight line that captures the overall pattern of the individual data points. When there is a positive relationship between the x-axis and y-axis variables, the trendline moves upwards from left to right. When there is a negative relationship between the x-axis and y-axis variables, the trendline moves downwards from left to right.

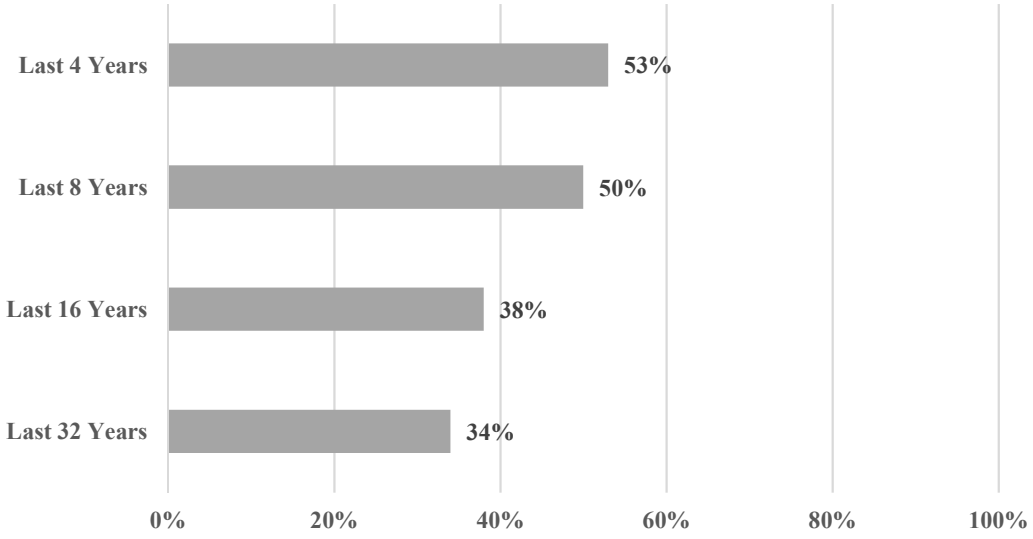
II. THE USE OF ASSAULT WEAPONS AND LCMS ARE MAJOR FACTORS IN THE RISE OF MASS SHOOTING VIOLENCE

12. In addition to showing that the frequency and lethality of high-fatality mass shootings are on the rise nationally, the data point to another striking pattern: both assault weapons and LCMs are being used with increased frequency to perpetrate gun massacres.[6] As shown in Figures 3-5, based on high-fatality mass shootings where details allow a determination on the use of assault weapons and LCMs are available, the pattern is particularly marked of late, with over half of all incidents in the last four years involving assault weapons, all incidents in the last four years involving LCMs having a capacity greater than 10 bullets, regardless of the type of firearm ("federal definition" hereinafter), and four out of five incidents involving LCMs having a capacity greater than 10 bullets for long guns and greater than 15 bullets for handguns, as defined by Illinois statute ("Illinois definition" hereinafter). As shown in Figures 6-8, a similar pattern is found when examining deaths in high-fatality mass shootings in the last four

[6] Assault weapons are generally semiautomatic firearms that fall into one of the following three categories: assault pistols, assault rifles, and assault shotguns. For purposes of this Declaration, unless otherwise stated, assault weapons are defined and coded in a manner consistent with **Exhibit C**. Per the 1994 federal ban definition, LCMs are generally ammunition-feeding devices with a capacity greater than 10 bullets. Under Illinois statute (720 ILCS 5/24-1.10), LCM capacity thresholds are set at greater than 10 bullets for long guns and greater than 15 bullets for handguns. For purposes of this Declaration, unless otherwise stated, LCMs will be defined in a manner consistent with the 1994 federal ban on LCMs, which defined them as ammunition-feeding devices with a capacity greater than 10 bullets. The ammunition threshold of the1994 federal definition (more than 10 bullets) is identical to that of the definition of LCMs in several local ordinances in Illinois, including Highland Park and Cook County. However, where appropriate, statistics relating to the Illinois definition of LCMs will be discussed. While the term "assault weapons" as referenced in the present case is defined by statute, the modern-day roots of the term can be traced back to the 1980s, when gun manufacturers branded military-style firearms with the label in an effort to make them more marketable to civilians. *See*, Violence Policy Center, *Assault Weapons and Accessories in America* (1988) (Attached as **Exhibit D**); Violence Policy Center, *Bullet Hoses: Semiautomatic Assault Weapons—What Are They? What's So Bad about Them?* (2003) (Attached as **Exhibit E**); Phillip Peterson, *Gun Digest Buyer's Guide to Assault Weapons* (2008) (Relevant Excerpt Attached as **Exhibit F**); and Erica Goode, "Even Defining 'Assault Rifles' Is Complicated," *New York Times*, January 16, 2013, *available at* https://www.nytimes.com/2013/01/17/us/even-defining-assault-weapons-is-complicated.html (last accessed January 24, 2023).

years, with 62% of deaths resulting from incidents involving assault weapons, 100% of deaths resulting from incidents involving LCMs as defined by the 1994 federal statute, and 82% of deaths resulting from incidents involving LCMs as defined by Illinois statute. These trends clearly demonstrate that, among perpetrators of gun massacres, there is a growing preference for using assault weapons and LCMs to pull off their attacks.[7]

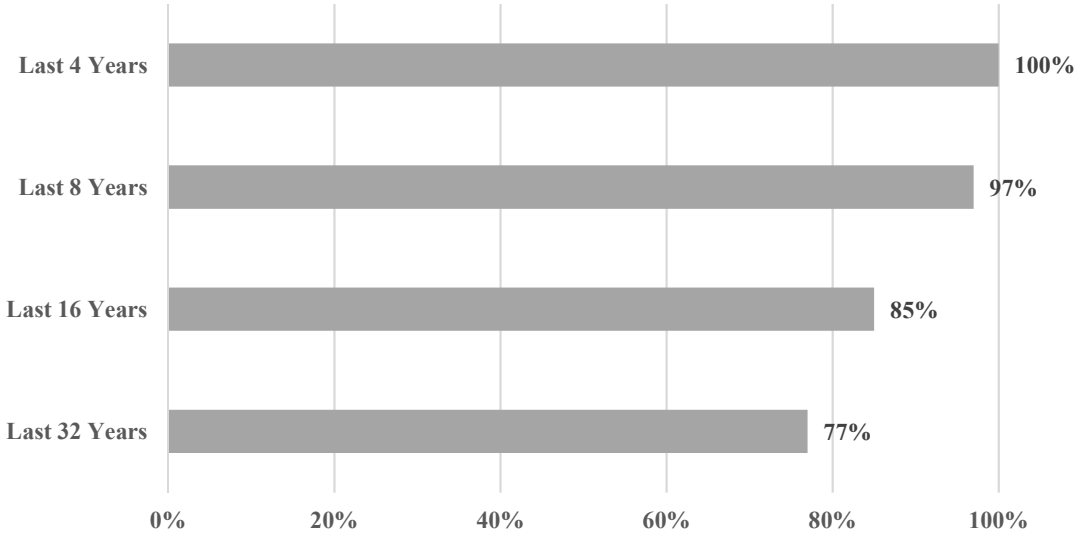
Figure 3. Share of High-Fatality Mass Shooting Incidents Involving Assault Weapons, 1991-2022



Note: The calculations in Figure 3 exclude incidents in which the firearms used are unknown.

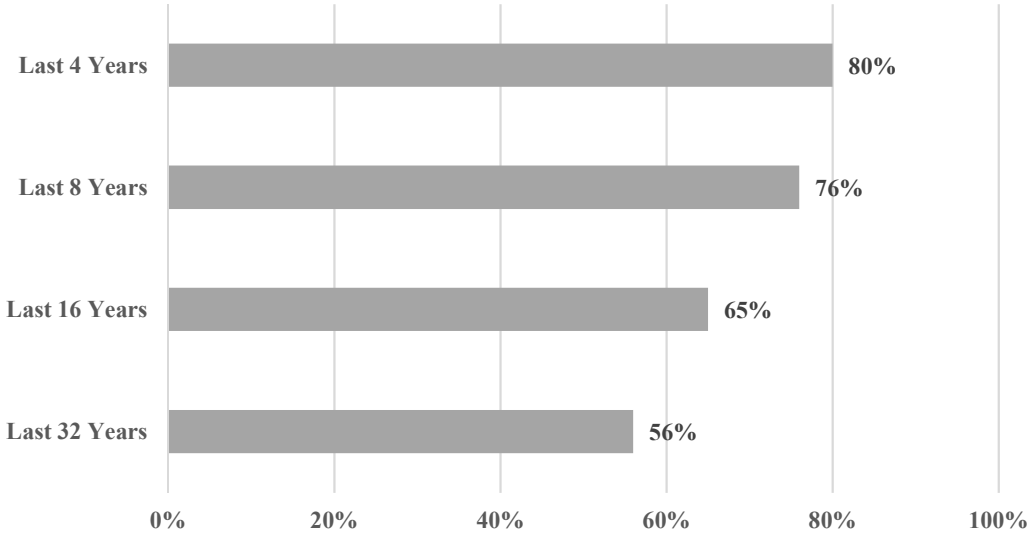
[7] Out of all 93 high-fatality mass shootings in the United States between 1991 and 2022, it cannot be determined whether LCMs were used in 14 of those incidents. Furthermore, for 2 of these 14 incidents, it is also not possible to determine whether they involved assault weapons. Therefore, the tables, figures, and percentages discussed in this section of the Declaration are based on calculations that only use data points from the incidents in which the involvement of assault weapons and/or LCMs could be determined.

Figure 4. Share of High-Fatality Mass Shooting Incidents Involving LCMs (Federal Definition of LCMs), 1991-2022



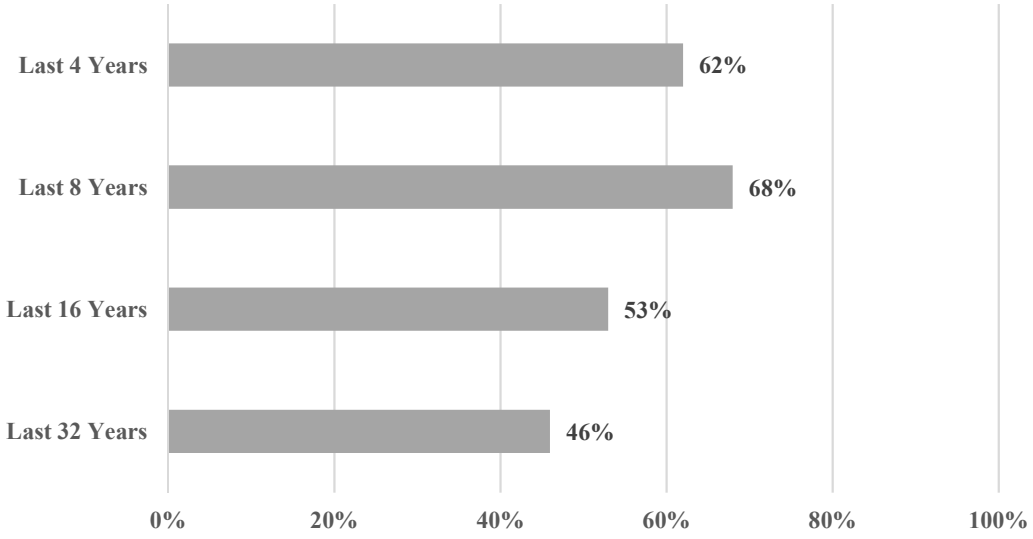
Note: The calculations in Figure 4 exclude incidents in which it is unknown if LCMs were used.

Figure 5. Share of High-Fatality Mass Shooting Incidents Involving LCMs (Illinois Definition of LCMs), 1991-2022



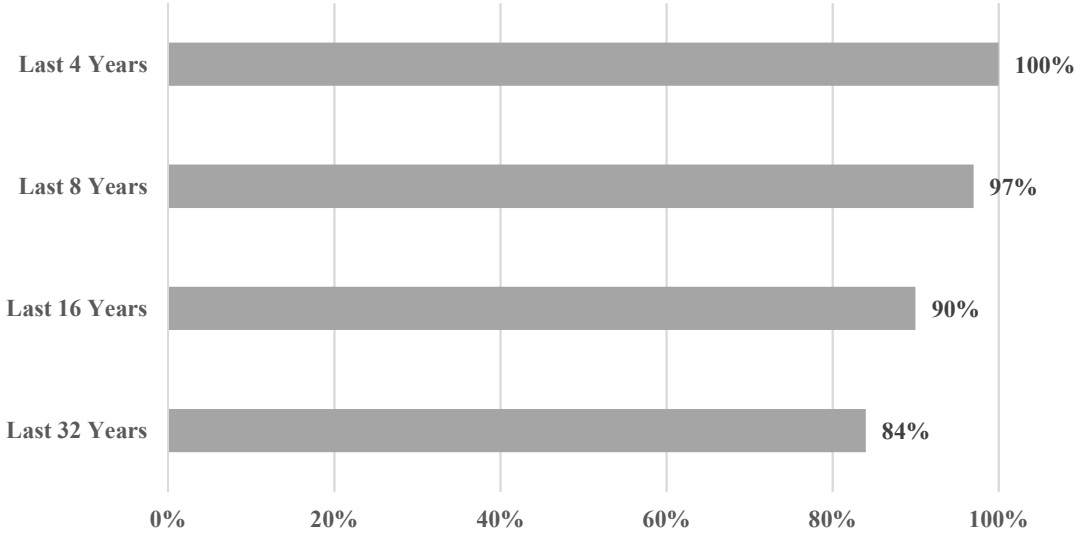
Note: The calculations in Figure 5 exclude incidents in which it is unknown if LCMs were used.

Figure 6. Share of High-Fatality Mass Shooting Deaths Resulting from Incidents Involving Assault Weapons, 1991-2022



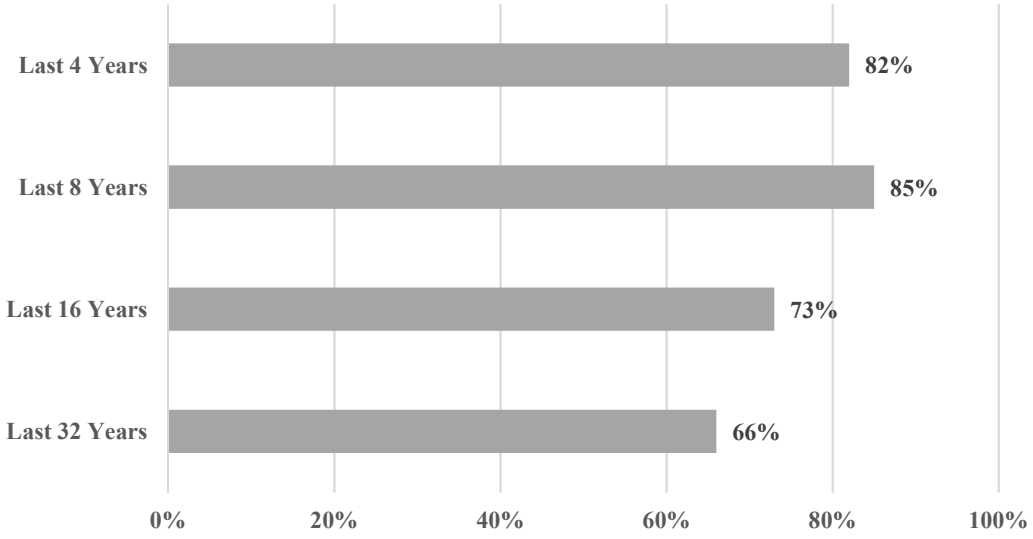
Note: The calculations in Figure 6 exclude incidents in which the firearms used are unknown.

Figure 7. Share of High-Fatality Mass Shooting Deaths Resulting from Incidents Involving LCMs (Federal Definition of LCMs), 1991-2022



Note: The calculations in Figure 7 exclude incidents in which it is unknown if LCMs were used.

Figure 8. Share of High-Fatality Mass Shooting Deaths Resulting from Incidents Involving LCMs (Illinois Definition of LCMs), 1991-2022



Note: The calculations in Figure 8 exclude incidents in which it is unknown if LCMs were used.

13. The growing use of assault weapons to carry out high-fatality mass shootings is an obvious theme reflected in the data. The *disproportionate* resort to assault weapons by perpetrators of high-fatality mass shootings is another clear theme. Based on National Sport Shooting Foundation (NSSF) and federal government data, "modern sporting rifles"—which is a firearm industry term for AR-15-platform and AK-47-platform firearms—make up approximately 5.3% of all firearms in circulation in American society, according to the most recent publicly-available data (24.4 million out of an estimated 461.9 million firearms).[8] And, in

[8] The 5.3% ownership rate for modern sporting rifles was calculated using NSSF and Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF) data. The NSSF estimates that there are approximately 24.4 million modern sporting rifles in civilian hands in the United States as of the end of 2020 (when the most recent data are available). NSSF, "Commonly Owned: NSSF Announces over 24 Million MSRs in Circulation," July 20, 2022, *available at* https://www.nssf.org/articles/commonly-owned-nssf-announces-over-24-million-msrs-in-circulation (last accessed January 3, 2023). In a 2020 report that captured data through the end of 2018, the NSSF estimated that there were 433.9 million total firearms in civilian circulation in the United States. NSSF, *Firearm Production in the United States with Firearm Import and Export Data*, Industry Intelligence Report, 2020, at 18, *available at* https://www.nssf.org/wp-content/uploads/2020/11/IIR-2020-Firearms-Production-v14.pdf (last accessed January 3, 2023).

all likelihood, this is an over-estimation because the figures appear to include firearms belonging to law enforcement agencies in the United States.[9] But even using this estimate (which is based in part on NSSF data), if assault weapons were used in proportion to the percentage of modern sporting rifles in circulation, approximately 5% of all high-fatality mass shootings would involve assault weapons. However, as seen in Figure 3 above, civilian ownership rates and mass-shooter use rates are not similar. Indeed, the current difference is approximately ten-fold, with the rate at which assault weapons are now used to commit gun massacres far outpacing the rate at which modern sporting rifles circulate amongst civilians in the United States.[10]

14. Another pattern that stands out when examining the relationship between assault weapons use and mass shooting violence reflects the disproportionately greater lethality associated with the use of assault weapons and LCMs. For instance, returning to the list of the 7 deadliest individual acts of intentional criminal violence in the United States since the coordinated terrorist attack of September 11, 2001, besides all seven of the incidents being mass shootings, 6 of the 7 incidents (86%) involved assault weapons and LCMs, as shown in Table 2. When examining all high-fatality mass shootings since 1991, the relationship between assault weapons use, LCM use, and higher death tolls is striking. In the past 32 years, assault weapons have been used in 34% of all high-fatality mass shootings, and LCMs as defined by the federal government and by Illinois have been used, respectively, in 77% and 56% of all high-fatality

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According to ATF data, in 2019 and 2020, an additional 28.0 million firearms entered the civilian stock nationwide. ATF, *National Firearms Commerce and Trafficking Assessment: Firearms in Commerce* (2022), at 181, 188, 193, *available at* https://www.atf.gov/firearms/docs/report/national-firearms-commerce-and-trafficking-assessment-firearms-commerce-volume/download (last accessed January 3, 2023). Assuming these figures reported by the NSSF and ATF are accurate, this brings the estimated number of firearms in civilian circulation through the end of 2020 to approximately 461.9 million. The ownership rate is calculated as follows: 24.4 million modern sporting rifles divided by 461.9 million total firearms equals approximately 5.3%.

[9] ATF, 2022, *supra* note 8, at 12; NSSF, 2020, *supra* note 8, at 2-3.

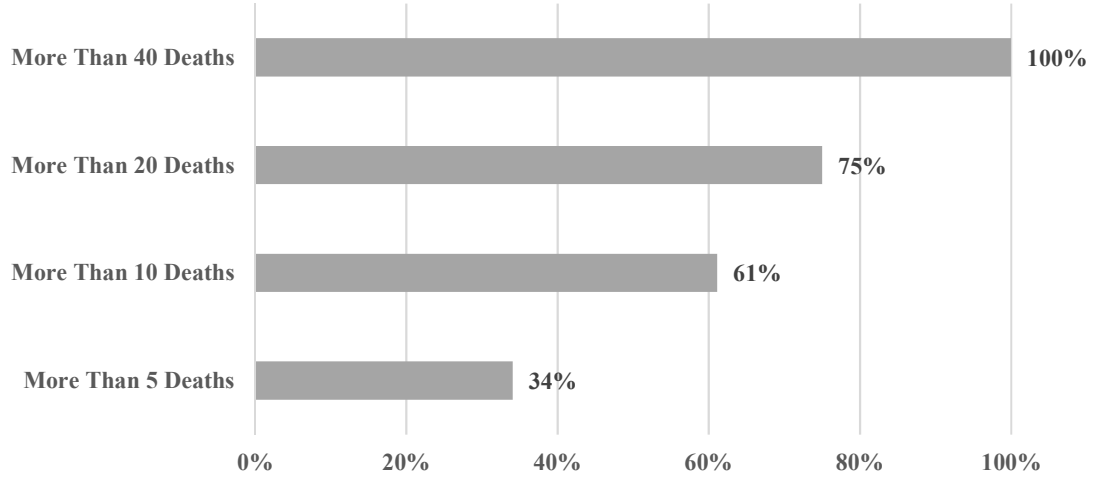
[10] Due to the lack of accurate data on the number of LCMs in civilian circulation, there is no way to perform a similar comparison using LCMs instead of modern sporting rifles.

mass shootings. However, as the fatality thresholds of such incidents increase, so too do the shares of incidents involving assault weapons and LCMs. For instance, assault weapons were used in 75% of all mass shootings resulting in more than 20 deaths, and LCMs as defined by the federal government and by Illinois were used, respectively, in 100% and 88% of all mass shootings resulting in more than 20 deaths (Figures 9-11). As the data show, there is an association between mass shooting lethality and the use of assault weapons and LCMs.

Table 2. The Use of Assault Weapons and LCMs in the Deadliest Acts of Intentional Criminal Violence in the U.S. since 9/11

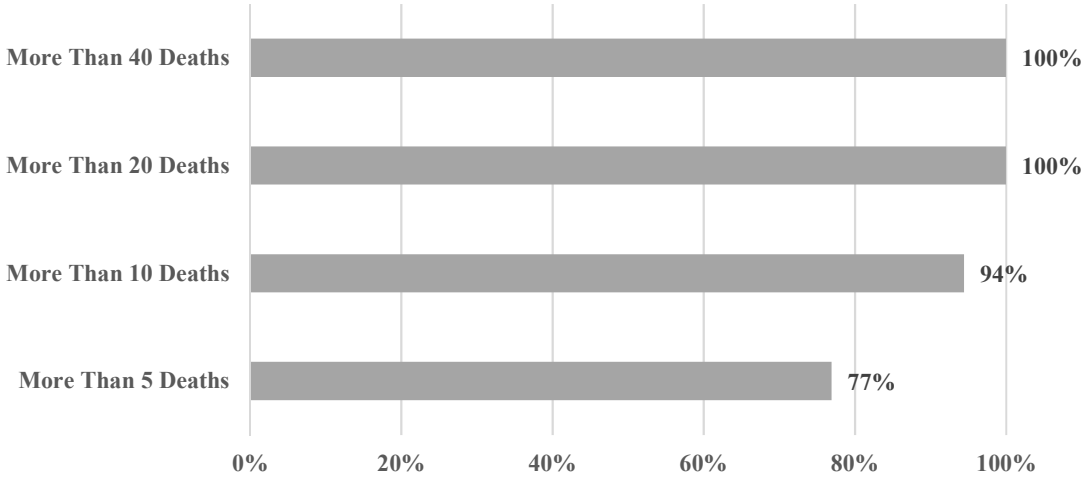
Deaths	Date	Location	Involved Assault Weapons	Involved LCMs (Federal Definition)	Involved LCMs (Illinois Definition)
60	10/1/2017	Las Vegas, NV	✓ (AR-15)	✓	✓
49	612/2016	Orlando, FL	✓ (AR-15)	✓	✓
32	4/16/2007	Blacksburg, VA		✓	
27	12/14/2012	Newtown, CT	✓ (AR-15)	✓	✓
25	11/5/2017	Sutherland Springs, TX	✓ (AR-15)	✓	✓
23	8/3/2019	El Paso, TX	✓ (AK-47)	✓	✓
21	5/24/2022	Uvalde, TX	✓ (AR-15)	✓	✓

Figure 9. Percentage of High-Fatality Mass Shootings Involving Assault Weapons by Fatality Threshold, 1991-2022



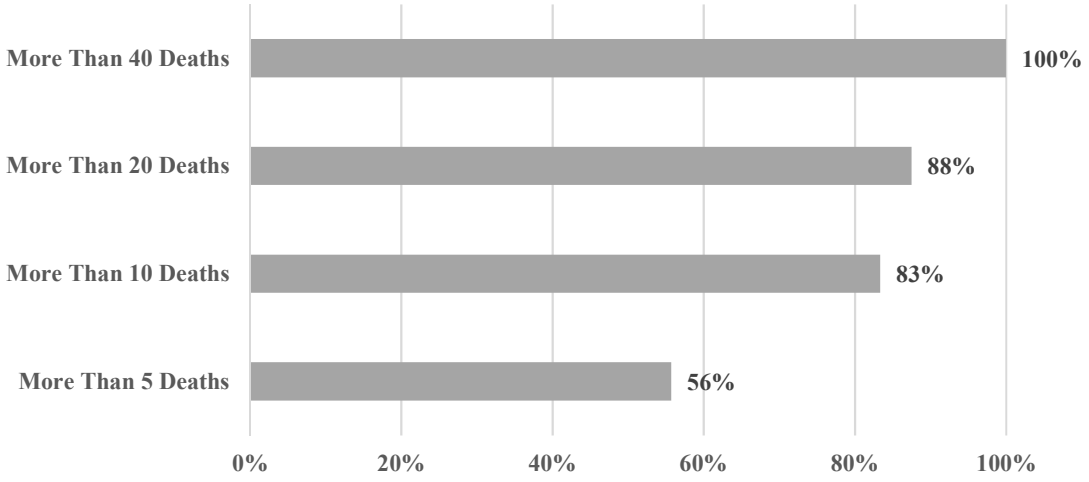
Note: The calculations in Figure 9 exclude incidents in which the firearms used are unknown.

Figure 10. Percentage of High-Fatality Mass Shootings Involving LCMs (Federal Definition of LCMs) by Fatality Threshold, 1991-2022



Note: The calculations in Figure 10 exclude incidents in which it is unknown if LCMs were used.

Figure 11. Percentage of High-Fatality Mass Shootings Involving LCMs (Illinois Definition of LCMs) by Fatality Threshold, 1991-2022



Note: The calculations in Figure 11 exclude incidents in which it is unknown if LCMs were used.

15. Of the 91 high-fatality mass shootings since January 1, 1991, in which the type of firearm used is known, 31 involved assault weapons, resulting in 425 deaths. The average death toll for these 31 incidents is 13.7 fatalities per shooting. By contrast, the average death toll for the 60 incidents in which it is known assault weapons were not used (which resulted in 490 fatalities) is 8.2 fatalities per shooting (Table 3). Furthermore, defining LCMs using the capacity threshold of the 1994 federal ban, of the 79 high-fatality mass shootings since January 1, 1991, in which LCM use was determined, 61 involved LCMs, resulting in 704 deaths. The average death toll for these 61 incidents is 11.5 fatalities per shooting. The average death toll for the 18 incidents in which it is known LCMs were not used (which resulted in 132 fatalities) is 7.3 fatalities per shooting (Table 4). Reviewing the same 79 incidents for LCM involvement using the capacity threshold of the 2023 Illinois ban, 44 involved LCMs, resulting in 553 deaths. The average death toll for these 44 incidents is 12.6 fatalities per shooting. The average death toll for the 35 incidents in which it is known LCMs were not used (which resulted in 283 fatalities) is 8.1 fatalities per shooting (Table 4). In other words, in the last 32 years, the use of assault weapons and both types of LCMs (federal and Illinois definitions) in gun massacres has, correspondingly, resulted in 67%, 58%, and 56% increases in average fatalities per incident (Tables 3-4).

16. Tables 5 and 6 show the average death tolls per high-fatality mass shooting incident that are attributable to assault weapons beyond deaths associated with the use of LCMs. In terms of the 1994 federal ban's magazine capacity threshold, when LCMs are not used, the average death toll is 7.3 fatalities. When LCMs are used, but not in conjunction with assault weapons, the average death toll is 9.2 fatalities. When LCMs are used with assault weapons, the average death toll is 14.0 fatalities. In terms of the 2023 Illinois ban's magazine capacity threshold, when LCMs are not used, the average death toll is 8.1 fatalities. When LCMs are used, but not in conjunction with assault weapons, the average death toll is 9.6 fatalities. When LCMs are used with assault weapons, the average death toll is 14.0 fatalities. The data show that using LCMs, as defined by the 1994 federal ban, without an assault weapon resulted in a 26%

increase in the average death toll. However, using LCMs, as defined by the 1994 federal ban, with an assault weapon resulted in a 52% increase in the average death toll associated with incidents that involved LCMs without assault weapons and a 92% increase in the average death toll associated with incidents that involved neither LCMs nor assault weapons. The data also show that using LCMs, as defined by the 2023 Illinois ban, without an assault weapon results in a 19% increase in the average death toll. However, using LCMs, as defined by the 2023 Illinois ban, with an assault weapon results in a 46% increase in the average death toll associated with incidents that involved LCMs without assault weapons and a 73% increase in the average death toll associated with incidents that involve neither LCMs nor assault weapons. In other words, regardless of which magazine capacity threshold is used to code incidents, the increase in the death tolls for high-fatality mass shootings that involve LCMs and/or assault weapons is partly attributable to LCMs and partly attributable to assault weapons.

17. This review of the data suggests that assault weapons *and* LCMs are force multipliers when used in mass shootings.

Table 3. The Average Death Tolls Associated with the Use of Assault Weapons in High-Fatality Mass Shootings in the U.S., 1991-2022

	Average Death Toll for Incidents That Did Not Involve the Use of Assault Weapons	Average Death Toll for Incidents That Did Involve the Use of Assault Weapons	Percent Increase in Average Death Toll Associated with the Use of Assault Weapons
1991-2022	8.2 Deaths	13.7 Deaths	67%

Note: The calculations in Table 3 exclude incidents in which the firearms used are unknown.

Table 4. The Average Death Tolls Associated with the Use of LCMs in High-Fatality Mass Shootings in the U.S., 1991-2022

	Average Death Toll for Incidents That Did Not Involve the Use of LCMs	Average Death Toll for Incidents That Did Involve the Use of LCMs	Percent Increase in Average Death Toll Associated with the Use of LCMs
1991-2022 (Federal Definition of LCM)	7.3 Deaths	11.5 Deaths	58%
1991-2022 (Illinois Definition of LCM)	8.1 Deaths	12.6 Deaths	56%

Note: The calculations in Table 4 exclude incidents in which it is unknown if LCMs were used.

Table 5. The Average Death Tolls Associated with the Use of LCMs (Federal Definition of LCMs) and Assault Weapons in High-Fatality Mass Shootings in the U.S., 1991-2022

Average Death Toll for Incidents Not Involving LCMs or AWs	Average Death Toll for Incidents Involving LCMs but Not AWs	Percent Increase	Average Death Toll for Incidents Involving LCMs but Not AWs	Average Death Toll for Incidents Involving LCMs and AWs	Percent Increase	Average Death Toll for Incidents Not Involving LCMs or AWs	Average Death Toll for Incidents Involving LCMs and AWs	Percent Increase
7.3	9.2	26%	9.2	14.0	52%	7.3	14.0	92%

Note: The calculations in Table 5 exclude incidents in which it is unknown if assault weapons or LCMs were used.

Table 6. The Average Death Tolls Associated with the Use of LCMs (Illinois Definition of LCMs) and Assault Weapons in High-Fatality Mass Shootings in the U.S., 1991-2022

Average Death Toll for Incidents Not Involving LCMs or AWs	Average Death Toll for Incidents Involving LCMs but Not AWs	Percent Increase	Average Death Toll for Incidents Involving LCMs but Not AWs	Average Death Toll for Incidents Involving LCMs and AWs	Percent Increase	Average Death Toll for Incidents Not Involving LCMs or AWs	Average Death Toll for Incidents Involving LCMs and AWs	Percent Increase
8.1	9.6	19%	9.6	14.0	46%	8.1	14.0	73%

Note: The calculations in Table 6 exclude incidents in which it is unknown if assault weapons or LCMs were used.

III. DOUBLE-DIGIT-FATALITY MASS SHOOTINGS ARE A POST-WORLD WAR II PHENOMENON IN AMERICAN HISTORY AND THEY INCREASINGLY INVOLVE ASSAULT WEAPONS

18. I have also examined the historical occurrence and distribution of mass shootings resulting in 10 or more victims killed since 1776 (Table 7 and Figure 12). A lengthy search uncovered several informative findings.[11] In terms of the origins of this form of extreme gun violence, there is no known occurrence of a mass shooting resulting in double-digit fatalities at any point in time during the 173-year period between the nation's founding in 1776 and 1948. The first known mass shooting resulting in 10 or more deaths occurred in 1949. In other words, for 70% of its 247-year existence as a nation, the United States did not experience a mass shooting resulting in double-digit fatalities, making them a relatively modern phenomena in American history.[12]

19. After the first such incident in 1949, 17 years passed until a similar mass shooting occurred in 1966. The third such mass shooting then occurred 9 years later, in 1975. And the fourth such incident occurred 7 years after, in 1982. Basically, the first few mass shootings resulting in 10 or more deaths did not occur until the post-World War II era. Furthermore, these first few double-digit-fatality incidents occurred with relative infrequency, although the temporal gap between these first four incidents shrank with each event (Table 7 and Figure 13).[13]

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[11] I searched for firearm-related "murders," using variations of the term, setting a minimum fatality threshold of 10 in the Newspaper Archive online newspaper repository, *available at* www.newspaperarchive.com (last accessed October 2, 2022). The Newspaper Archive contains local and major metropolitan newspapers dating back to 1607. Incidents of large-scale, inter-group violence such as mob violence, rioting, combat or battle skirmishes, and attacks initiated by authorities acting in their official capacity were excluded.

[12] Using the Constitution's effective date of 1789 as the starting point would lead to the conclusion that, for 68% of its 234-year existence as a nation, the United States did not experience a mass shooting resulting in double-digit fatalities.

[13] Figures 12-13 are reproduced in larger form as **Exhibit G** of this Declaration.

Table 7. Mass Shootings Resulting in Double-Digit Fatalities in U.S. History, 1776-2022

	Date	Location	Deaths	Involved Assault Weapon(s)	Involved LCM(s)
1	9/6/1949	Camden, NE	13	N	N
2	8/1/1966	Austin, TX	14	N	Y
3	3/30/1975	Hamilton, OH	11	N	N
4	9/25/1982	Wilkes-Barre, PA	13	Y	Y
5	2/18/1983	Seattle, WA	13	N	N
6	4/15/1984	Brooklyn, NY	10	N	N
7	7/18/1984	San Ysidro, CA	21	Y	Y
8	8/20/1986	Edmond, OK	14	N	N
9	10/16/1991	Killeen, TX	23	N	Y
10	4/20/1999	Littleton, CO	13	Y	Y
11	4/16/2007	Blacksburg, VA	32	N	Y
12	3/10/2009	Geneva County, AL	10	Y	Y
13	4/3/2009	Binghamton, NY	13	N	Y
14	11/5/2009	Fort Hood, TX	13	N	Y
15	7/20/2012	Aurora, CO	12	Y	Y
16	12/14/2012	Newtown, CT	27	Y	Y
17	9/16/2013	Washington, DC	12	N	N
18	12/2/2015	San Bernardino, CA	14	Y	Y
19	6/12/2016	Orlando, FL	49	Y	Y
20	10/1/2017	Las Vegas, NV	60	Y	Y
21	11/5/2017	Sutherland Springs, TX	25	Y	Y
22	2/14/2018	Parkland, FL	17	Y	Y
23	5/18/2018	Santa Fe, TX	10	N	N
24	10/27/2018	Pittsburgh, PA	11	Y	Y
25	11/7/2018	Thousand Oaks, CA	12	N	Y
26	5/31/2019	Virginia Beach, VA	12	N	Y
27	8/3/2019	El Paso, TX	23	Y	Y
28	3/22/2021	Boulder, CO	10	Y	Y
29	5/14/2022	Buffalo, NY	10	Y	Y
30	5/24/2022	Uvalde, TX	21	Y	Y

Note: Death tolls do not include perpetrators. An incident was coded as involving an assault weapon if at least one of the firearms discharged was defined as an assault weapon in (1) the 1994 Federal Assault Weapons Ban or (2) the statutes of the state where the gun massacre occurred. An incident was coded as involving an LCM if at least one of the firearms discharged had an ammunition-feeding device holding more than 10 bullets.

Figure 12. Mass Shootings Resulting in Double-Digit Fatalities in U.S. History, 1776-2022

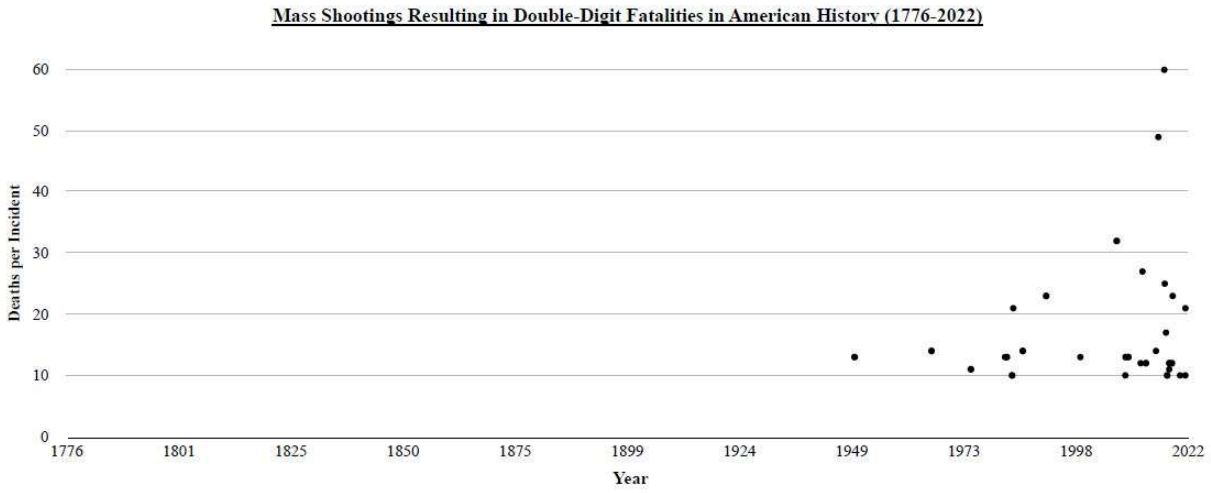
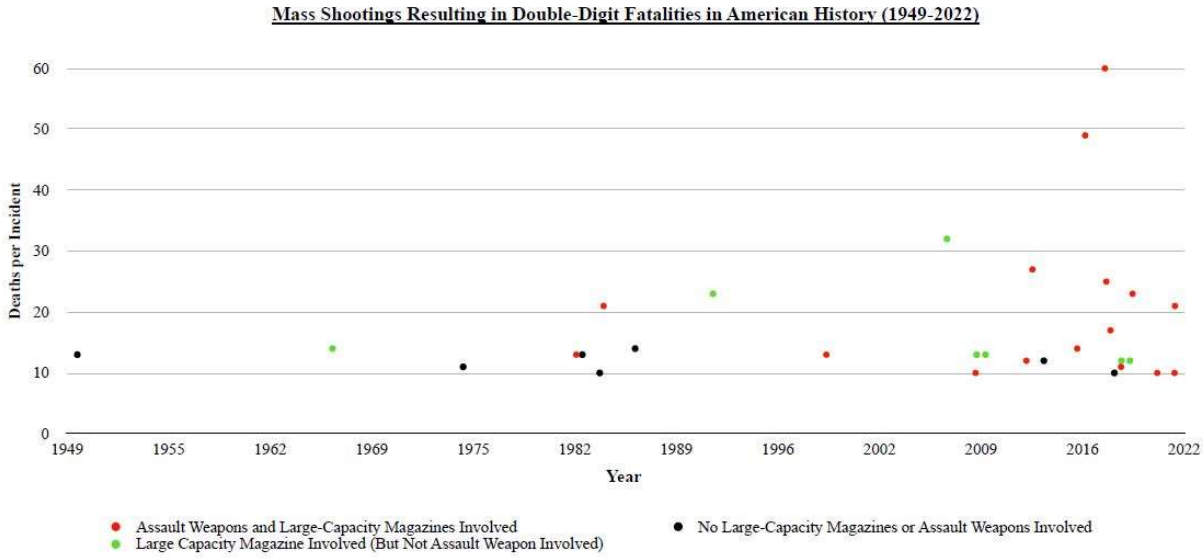


Figure 13. Mass Shootings Resulting in Double-Digit Fatalities in U.S. History, 1949-2022



20. The distribution of double-digit-fatality mass shootings changes in the early 1980s, when five such events took place in a span of just five years. (Table 7 and Figure 13). This timeframe also reflects the first time that assault weapons were used to perpetrate mass

shootings resulting in 10 or more deaths: the 1982 Wilkes-Barre, PA, massacre (involving an AR-15 rifle and resulting in 13 deaths) and the 1984 San Ysidro, CA, massacre (involving an Uzi pistol and resulting in 21 deaths). But this cluster of incidents was followed by a 20-year period in which only 2 double-digit-fatality mass shootings occurred (Figure 13). This period of time from 1987-2007 correlates with three important federal firearms measures: the 1986 Firearm Owners Protection Act, the 1989 C.F.R. "sporting use" importation restrictions, and the 1994 Federal Assault Weapons Ban.

21. It is well-documented in the academic literature that, after the Federal Assault Weapons Ban expired in 2004, mass shooting violence increased substantially.[14] Mass shootings that resulted in 10 or more deaths were no exception, following the same pattern. In the 56 years from 1949 through 2004, there were a total of 10 mass shootings resulting in double-digit fatalities (a frequency rate of one incident every 5.6 years). In the 18 years since 2004, there have been 20 double-digit-fatality mass shootings (a frequency rate of one incident every 0.9 years). In other words, the frequency rate has increased over six-fold since the Federal Assault Weapons Ban expired (Table 7 and Figure 13). (The 1994 Federal Assault Weapons Ban and its impact on mass shooting violence is discussed in further detail in Section VI of this Declaration.)

22. Over three-quarters of the mass shootings resulting in 10 or more deaths involved assault weapons and/or LCMs (Table 7). As also shown in the analyses of mass shootings in Section II, death tolls in double-digit-fatality mass shootings are related to the use of firearm technologies like assault weapons and LCMs that, in terms of mass shootings, serve as force multipliers.

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[14] *See*, for example, Louis Klarevas, *supra* note 1 (Relevant Excerpt Attached as **Exhibit H**); Louis Klarevas, et al., *supra* note 2 (Attached as **Exhibit I**); Charles DiMaggio, et al., "Changes in US Mass Shooting Deaths Associated with the 1994-2004 Federal Assault Weapons Ban: Analysis of Open-Source Data," 86 *Journal of Trauma and Acute Care Surgery* 11 (2019) (Attached as **Exhibit J**); Lori Post, et al., "Impact of Firearm Surveillance on Gun Control Policy: Regression Discontinuity Analysis," 7 *JMIR Public Health and Surveillance* (2021) (Attached as **Exhibit K**); and Philip J. Cook and John J. Donohue, "Regulating Assault Weapons and Large-Capacity Magazines for Ammunition," 328 *JAMA*, September 27, 2022 (Attached as **Exhibit L**).

IV. ASSAULT WEAPONS ARE ALMOST NEVER USED BY PRIVATE CITIZENS IN SELF-DEFENSE DURING ACTIVE SHOOTINGS

23. An important question that, until now, has gone unanswered is: Are assault weapons used as frequently to stop mass shootings as they are to perpetrate them? As shown above in Section II, assault weapons have been used to perpetrate approximately one-third of high-fatality mass shootings in the past 32 years (Figure 3). And in the past 8 years, the share of high-fatality mass shootings that has been perpetrated with assault weapons has risen to approximately half (Figure 3).

24. The Federal Bureau of Investigation (FBI) has been documenting active shooter incidents since 2000.[15] According to the FBI, active shootings are violent attacks that involve "one or more individuals actively engaged in killing or attempting to kill people in a populated area."[16] A simple way to conceptualize active shooter incidents is to think of them as attempted mass shootings. As part of its analysis of attempted mass shootings, the FBI identifies incidents that involved armed civilians using their personal firearms to intervene, regardless of whether the interventions were successful in stopping the attacks and/or neutralizing the perpetrator(s).

25. In the 22 years between January 1, 2000, and December 31, 2021, the FBI has identified 406 active shootings occurring in the United States. Out of these 406 active shooter incidents, 15 incidents (3.7%) involved defensive gun uses (DGUs) by civilians, excluding law enforcement or armed security.[17] Of these 15 DGUs that involved an armed private citizen

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[15] All of the information in this section, including definitions and data, are publicly available from the FBI. *See* FBI, "Active Shooter Safety Resources," *available at* https://www.fbi.gov/how-we-can-help-you/safety-resources/active-shooter-safety-resources (last accessed January 2, 2023). At the time that this Declaration was being prepared, active shooter incident data was not yet available for the year 2022. This data will likely be released by the FBI at some point in 2023. As such, the time parameter for the analysis in this section is 2000-2021.

[16] The FBI adds, "Implicit in this definition is the shooter's use of one or more firearms. The 'active' aspect of the definition inherently implies the ongoing nature of the incidents, and thus the potential for the response to affect the outcome." *Ibid.*

[17] In 14 of these 15 DGU-involved active shooter incidents, there was an exchange of gunfire. For the one incident that did not involve an exchange of gunfire, the gun (a handgun) was used to detain the active shooter after the shooting had ceased. *Ibid.*

intervening, 12 incidents involved handguns.[18] The remaining 3 incidents involved long guns: 1 shotgun, 1 bolt-action rifle, and 1 assault rifle. In other words, out of the 15 incidents where an armed civilian intervened, only 1 incident (6.7%) involved an assault weapon.[19] Within the broader context of all active shooter incidents, only 1 incident out of 406 in the past 22 years (0.2%) involved an armed civilian intervening with an assault weapon.[20]

26. The bottom line: assault weapons are used by civilians with a far greater frequency to perpetrate mass shootings than to stop mass shootings.[21]

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[18] All 12 DGU incidents that involved handguns also involved armed civilians who held valid concealed-carry permits. *Ibid*. In 10 of these 12 incidents, details about the types of handguns used in self-defense were available in news media accounts or in news media photographs of the crime scene. In 2 of the 12 incidents, the use of concealed handguns was inferred based on details about the shooting reported in news media accounts. There is no evidence that either of these 2 DGU incidents involved an assault pistol as defined under either the 1994 federal assault weapons ban or under the 2023 Illinois assault weapons ban.

[19] The FBI also identifies an incident in which an armed individual (a local firefighter) subdued and detained a school shooter, but there is no evidence that the armed firefighter drew his handgun during the incident. Moreover, local authorities have refused to comment on whether the firefighter ever drew his handgun. *See* Carla Field, "Firefighter Was Armed During Takedown of Shooting Suspect, Sheriff Says," WYFF, October 3, 2016, *available at* https://www.wyff4.com/article/firefighter-was-armed-during-takedown-of-shooting-suspect-sheriff-says/7147424 (last accessed January 3, 2023). Adding this incident to the 15 DGU-involved incidents would mean that 6.3% (as opposed to 6.7%) of the active shooter incidents, where an armed civilian intervened, involved an assault weapon.

[20] FBI, *supra* note 15. The one DGU that involved an assault weapon was the 2017 church massacre in Sutherland Springs, Texas. In that incident, an armed private citizen used an AR-15-style assault rifle to wound the perpetrator as he was attempting to flee the scene. While the perpetrator was still able to flee the scene despite being shot, minutes later, he crashed his vehicle trying to escape and then took his life with his own firearm before law enforcement could apprehend him. *See* Adam Roberts, "Man Who Shot Texas Gunman Shares His Story," KHBS/KHOG, November 7, 2017, *available at* https://www.4029tv.com/article/man-who-shot-texas-church-gunman-shares-his-story/13437943 (last accessed January 3, 2023).

[21] Given the limitations of the active shooter incident data reported by the FBI, it is not possible to discern whether any of the civilian DGUs involved an armed civilian using a firearm with an LCM at the time of the intervention. As such, it is not possible to perform a similar comparison between mass shootings perpetrated with LCM-equipped firearms and mass shootings thwarted with LCM-equipped firearms.

V. OWNERSHIP RATES OF "MODERN SPORTING RIFLES" IN THE U.S.

27. As noted above in Para. 13, based on the most recent publicly-available NSSF and federal government data, modern sporting rifles—such as AR- and AK-platform firearms—appear to make up as many as 5.3% of all firearms in circulation in American society (24.4 million out of an estimated 461.9 million firearms, although this is likely an over-estimate due to the apparent inclusion of modern sporting rifles possessed by law enforcement agencies). Furthermore, in its most recent survey data (2022), the NSSF found that civilian owners of modern sporting rifles own, on average, 3.8 such rifles, with 24% of these owners possessing only one such rifle.[22] Based on this data, only 6.4 million gun owners—out of an estimated 81 million Americans who own at least one personal firearm—own modern sporting rifles.[23] In other words, less than 8% of all civilian gun owners in the United States own modern sporting rifles.[24] In terms of the total population of the United States, estimated by the Census Bureau to be approximately 333 million people in 2022, less than 2% of all Americans own a modern sporting rifle.[25]

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[22] NSSF, *Modern Sporting Rifle: Ownership, Usage and Attitudes Toward AR- and AK-Platform Modern Sporting Rifles*, Comprehensive Consumer Report, 2022, at 12, *available at* https://www3.nssf.org/share/PDF/pubs/NSSF-MSR-Comprehensive-Consumer-Report.pdf (last accessed January 16, 2023).

[23] The estimate that approximately 6.4 million gun owners possess what the NSSF considers to be modern sporting rifles is calculated by dividing the 3.8 average number of such rifles that each modern sporting rifle owner possesses into the 24.4 million such rifles estimated to be in civilian circulation. This calculation (24.4 million divided by 3.8) equals 6.4 million. Based on survey data, 81 million American adults are estimated to own guns. Andy Nguyen, "Proposed Assault Weapons Ban Won't Turn Gun Owners into Felons Overnight," PolitiFact, The Poynter Institute, August 3, 2022, *available at* https://www.politifact.com/factchecks/2022/aug/03/instagram-posts/proposed-assault-weapons-ban-wont-turn-gun-owners- (last accessed January 16, 2023).

[24] The finding that less than 8% of all gun owners possess modern sporting rifles is calculated by dividing the 6.4 million modern sporting rifle owners by the 81 million American adults estimated to be gun owners. Taking 6.4 million and dividing it by 81 million equals 7.9%.

[25] The Census Bureau's total population estimate for 2022 is 333,287,557 persons. U.S. Census Bureau, "Growth in U.S. Population Shows Early Indication of Recovery Amid COVID-19 Pandemic," December 22, 2022, *available at* https://www.census.gov/newsroom/press-releases/2022/2022-population-

28. In deriving its estimates, the NSSF often relies on United States government data, particularly ATF data.[26] According to the ATF, from 1986 through 2020 (which reflects the most currently-available data), the civilian stock of firearms in the United States has been made up predominantly of handguns.[27] As Figure 14 shows, handguns account for 50% of the civilian stock of firearms, rifles account for 33%, and shotguns account for 17%.

29. According to ATF data, handguns are the most commonly owned firearms; not rifles, and most certainly not modern sporting rifles that qualify as assault weapons.[28]

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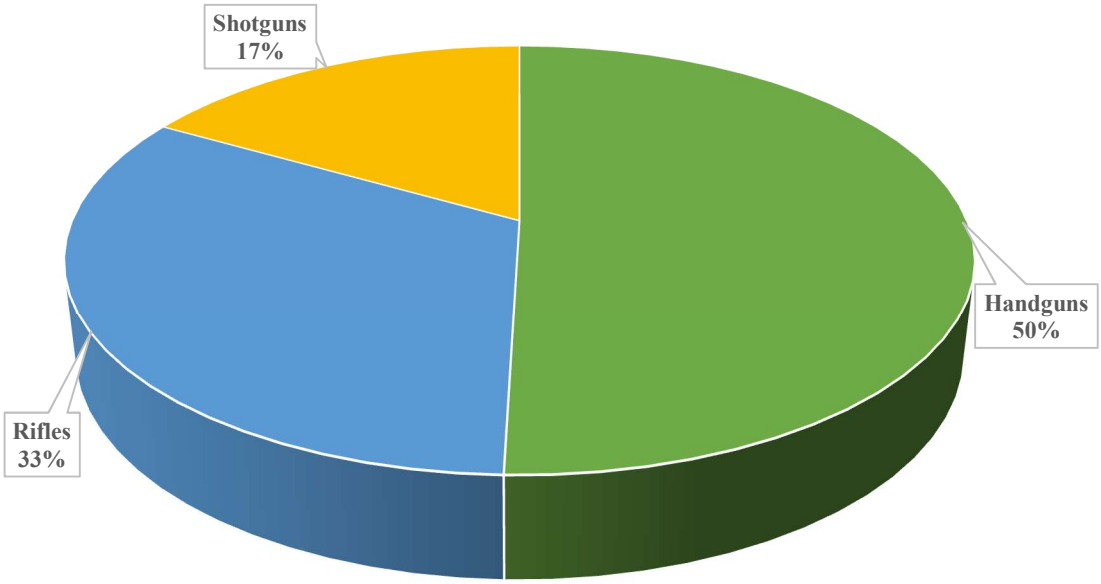
estimates.html#:~:text=DEC.,components%20of%20change%20released%20today (last accessed January 16, 2023). The finding that less than 2% of all Americans possess modern sporting rifles is calculated by dividing the 6.4 million modern sporting rifle owners by the 333 million persons in United States. Taking 6.4 million and dividing it by 333 million equals 1.9%.

[26] NSSF, 2020, *supra* note 8.

[27] For data on the number of firearms manufactured, imported, and exported, by category of firearm, from 2000-2020, *see* ATF, *supra* note 8. For similar data covering 1986-1999, *see* ATF, *Firearms Commerce in the United States: Annual Statistical Update, 2021*, *available at* https://www.atf.gov/firearms/docs/report/2021-firearms-commerce-report/download (last accessed January 16, 2023).

[28] Due to the lack of accurate data on the number of LCMs in civilian circulation, there is no way to perform a similar analysis of ownership rates using LCMs instead of modern sporting rifles. Some Plaintiffs do, however, suggest in their pleadings that, as of 2021, there might be as many as 542 million LCMs in civilian hands in the U.S. (as many as 273 million LCMs for long guns and as many as 269 million LCMs for handguns). *See*, for example, Plaintiffs' Motion for Preliminary Injunction, *Harrel v. Raoul*, Case No. 23-cv-141-SPM (S.D. Ill.), at 17-18; citing William English, "2021 National Firearms Survey: Updated Analysis Including Types of Firearms Owned," Unpublished Paper (May 13, 2022; Revised September 22, 2022), *available at* https://papers.ssrn.com/sol3/cf_dev/AbsByAuth.cfm?per_id=4283305 (last accessed February 6, 2023). In 2013, the estimated number of LCMs in circulation was approximately 40 million. *See*, Patrik Jonsson, "Gun Debate 101: Time to Ban High-Capacity Magazines?" *Christian Science Monitor*, January 16, 2013, *available at* https://www.csmonitor.com/USA/Politics/DC-Decoder/2013/0116/Gun-debate-101-Time-to-ban-high-capacity-magazines (last accessed February 6, 2023). The Plaintiffs are suggesting that the number of LCMs might now be 542 million. If so, this would mark an increase of over 13 times in just 8 years, from an estimated 40 million LCMs in 2013 to an estimated 542 million LCMs in 2021. The Plaintiffs' source for this is a survey that is discussed in an unpublished, non-peer-reviewed paper. This survey also found that the state with the highest percentage of gun owners claiming to have owned an LCM (69.2%) was the District of Columbia, which arguably also has the tightest restrictions on LCM ownership in the U.S. English, 2022, at 27. However, because this survey appears to be in violation of the Code of Professional Ethics and Practices of the American Association for Public Opinion Research, including failing to identify the source of sponsorship funding and failing to

Figure 14. Share of Firearms in Civilian Circulation in the United States, 1986-2020



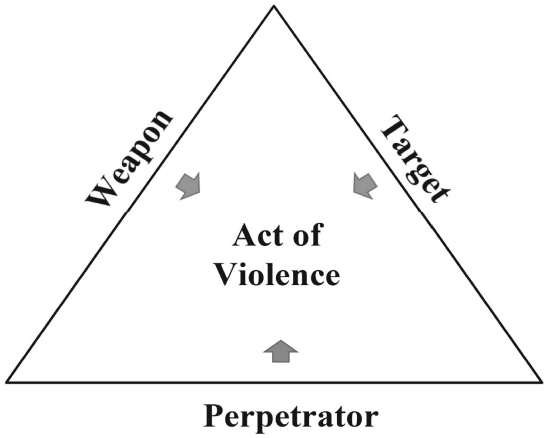
fully disclose the measurement tools (Rules III.A.2-3), there is good reason to question the integrity and findings of this survey. *See*, "AAPOR Code of Professional Ethics and Practices," April 2021, *available at* https://www-archive.aapor.org/Standards-Ethics/AAPOR-Code-of-Ethics.aspx (last accessed February 6, 2023).

VI. RESTRICTIONS ON ASSAULT WEAPONS AND LCMS REDUCE THE INCIDENCE OF GUN MASSACRES, RESULTING IN LIVES SAVED

VI.A. THE OPERATIVE MECHANISM OF ASSAULT WEAPONS BANS: SUPPRESSION AND SUBSTITUTION EFFECTS

30. As conceptualized in the Trinity of Violence model that I developed in my book on mass shootings, every act of violence involves three elements: a perpetrator, a weapon, and a target (Figure 15).[29] The key to mitigating violence is to "break the trinity" by hindering at least one of the three elements. This is accomplished by dissuading the potential offender(s), denying the potential instrument(s) of violence, or defending the potential victim(s).[30]

Figure 15. The Trinity of Violence



31. Bans are law-based concepts that prohibit certain behaviors by criminalizing them.[31] Bans on assault weapons and LCMs generally make it illegal to manufacture, import, transfer, own, or possess certain firearms and certain magazines. Bans work in relation to two of

[29] Klarevas, *supra* note 1, at 27-29, 229-238.

[30] Ibid.

[31] Philip J. Cook, "Research in Criminal Deterrence: Laying the Groundwork for the Second Decade," 2 *Crime and Justice* 211 (1980) (Attached as **Exhibit M**); and Daniel S. Nagin, "Deterrence in the Twenty-First Century," 42 *Crime and Justice* 199 (2013) (Attached as **Exhibit N**).

the three elements of the Trinity of Violence: dissuasion and denial. With regard to perpetrators, bans use the threat of criminal penalty to *deter potential offenders* from engaging in the prohibited behavior. In the case of bans on assault weapons and LCMs, they threaten conviction, imprisonment, and/or fines should an individual build or otherwise acquire a prohibited assault weapon or LCM. The primary mechanism at work here centers around dissuading potential shooters from trying to acquire banned firearm technologies. But there is also a secondary mechanism at work, focused on the assault weapon or LCM itself: *deprive potential instruments of violence*. Knowing that someone who is willing to commit murder might not be deterred from violating another criminal law, like possessing a prohibited item, bans on assault weapons and LCMs also threaten punishment against anyone who tries to transfer (through sale, gift, or loan) a restricted item to someone who is prohibited from acquiring it. This, in essence, reinforces the strategy of dissuading the offender with the strategy of denying the instruments of violence.

32. Ideally, someone intent on committing a mass shooting with an assault weapon and/or LCM would be dissuaded from going on a rampage by the fact that their means of choice are not available. In such a scenario, the attack would be quashed. This *suppression effect* is akin to what economists and psychologists refer to as a positive spillover effect, where one desirable outcome produces a second, loosely-related desirable outcome.[32] A real-world example of this is the so-called "Matrix Killings," where a 19-year-old Virginia man blamed *The Matrix* film for driving him to murder his parents with a shotgun (that did not have an LCM). At the time of the crime in 2003, the federal Assault Weapons Ban was in effect, preventing him from obtaining an assault rifle and LCMs. In a 2013 jailhouse interview, he told CNN, "If I had an assault weapon, things would have been much worse." He added that had he had an AR-15 instead of a shotgun, he is positive that, after killing his parents, he would have gone on a

[32] Paul Dolan and Mateo M. Galizzi, "Like Ripples on a Pond: Behavioral Spillovers and Their Implications for Research and Policy," 47 *Journal of Economic Psychology* 1 (2015) (Attached as **Exhibit O**); K. Jane Muir and Jessica Keim-Malpass, "Analyzing the Concept of Spillover Effects for Expanded Inclusion in Health Economics Research," 9 *Journal of Comparative Effectiveness Research* 755 (2020) (Attached as **Exhibit P**).

rampage and "killed as many people as I possibly could." As he noted, "because I didn't have an assault weapon, that didn't happen."[33] In this case, the unavailability of an assault weapon due to the federal ban suppressed the perpetrator's impulse to commit a mass shooting.

33. Of course, some potential mass shooters will not be discouraged from going on a killing spree just because their means of choice are unavailable. They will instead replace their desired instruments of violence with available alternatives. This is commonly referred to as the *substitution effect*, wherein an act of violence is still perpetrated, but with a different, less lethal instrument of violence.[34] A real-world example of the substitution effect at work is the 2019 synagogue rampage in Poway, California. In that attack, the gunman appears to have been unable to acquire an assault rifle and LCMs due to California's ban on both. Instead, he acquired what is known as a California-compliant semiautomatic rifle (which lacked features such as a pistol grip and a forward hand grip) and 10-round magazines. As a result, the gunman quickly ran out of bullets, and while pausing to reload—which appears to have been extremely difficult given that he did not have assault weapon features on his rifle that facilitated fast reloading—a congregant chased him away, preventing him from continuing his attack.[35] In this incident, which resulted in one death, California's ban on assault weapons and LCMs worked exactly as intended. It prevented the active shooter from being able to kill enough people to surpass the fatality threshold of a mass shooting. Stated differently, if you examine data sets that identify shootings resulting in mass murder, you will not find the Poway synagogue attack on their lists.

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[33] "Inside the Mind of a Killer," CNN (Transcripts), August 23, 2013, *available at* https://transcripts.cnn.com/show/pmt/date/2013-08-23/segment/01 (last accessed January 24, 2023.

[34] Philip J. Cook, "The Effect of Gun Availability on Violent Crime Patterns," 455 *Annals of the American Academy of Political and Social Science* 63 (1981) (Attached as **Exhibit Q**); Anthony A. Braga, et al. "Firearm Instrumentality: Do Guns Make Violent Situations More Lethal?" 4 *Annual Review of Criminology* 147 (2021) (Attached as **Exhibit R**).

[35] Elliot Spagat and Julie Watson, "Synagogue Shooter Struggled with Gun, Fled with 50 Bullets," Associated Press, April 30, 2019, *available at* https://apnews.com/article/shootings-north-america-us-news-ap-top-news-ca-state-wire-8417378d6b934a8f94e1ea63fd7c0aea (last accessed January 24, 2023).

34. It might seem perverse to think that restrictions on certain instruments of violence operate on the premise that, if an act of violence cannot be averted, then it will proceed with an alternative instrument. Nevertheless, this is exactly how bans on assault weapons and LCMs work in theory. They suppress the inclinations of potential mass shooters to go on killing rampages in the first place because their means of choice are unavailable. And, should deterrence fail, bans force perpetrators to substitute less lethal instruments for more dangerous, prohibited ones, reducing the casualty tolls of attacks when they do occur.

VI.B. THE OPERATIVE MECHANISM OF LCM BANS: FORCING PAUSES IN ACTIVE SHOOTINGS

35. Restrictions on assault weapons and LCMs also address the multiple advantages LCMs provide to active shooters. Offensively, LCMs increase kill potential. Basically, the more bullets a shooter can fire at a target within a finite amount of time, the more potential wounds they can inflict. Furthermore, the more bullets that strike a victim, the higher the odds that that person will die. These two factors—sustained-fire capability and multiple-impact capability—allow LCMs to increase a shooter's kill potential.

36. When inserted into either a semiautomatic or fully-automatic firearm, an LCM facilitates the ability of an active shooter to fire a large number of rounds at an extremely quick rate without pause. This phenomenon—sustained-fire capability—comes in handy when a target is in a gunman's line of sight for only a few seconds. For example, sustained-fire capability allows a reasonably competent shooter to fire three rounds per second with a semiautomatic firearm and ten rounds per second with an automatic firearm. That results in numerous chances to hit a target in a short window of opportunity, especially when ammunition capacity is large.

37. LCMs also facilitate the ability of a shooter to strike a human target with more than one round. This phenomenon—multiple-impact capability—increases the chances that the victim, when struck by multiple rounds, will die. At least two separate studies have found that, when compared to the fatality rates of gunshot wound victims who were hit by only a single

bullet, the fatality rates of those victims hit by more than one bullet were over 60 percent higher.[36] The implication is straightforward: being able to strike human targets with more than one bullet increases a shooter's chances of killing their victims. In essence, LCMs are force multipliers when it comes to kill potential—and the evidence from gun massacres supports this conclusion (*see* Section II).

38. In addition to offensive advantages, LCMs also provide the defensive advantage of extended cover. During an active shooting, a perpetrator is either firing their gun or not firing their gun. While pulling the trigger, it is difficult for those in harm's way to take successful defensive maneuvers. But if the shooter runs out of bullets, there is a lull in the shooting. This precious downtime affords those in the line of fire with a chance to flee, hide, or fight back.

39. There are several examples of individuals fleeing or taking cover while active shooters paused to reload. For instance, in 2012, several first-graders at Sandy Hook Elementary School in Newtown, Connecticut, escaped their attacker as he was swapping out magazines, allowing them to exit their classroom and dash to safety.[37] Other well-known examples include the 2007 Virginia Tech and the 2018 Borderline Bar and Grill rampages.[38] There is also the possibility that someone will rush an active shooter and try to tackle them (or at the very least try

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[36]Daniel W. Webster, et al., "Epidemiologic Changes in Gunshot Wounds in Washington, DC, 1983–1990," 127 *Archives of Surgery* 694 (June 1992) (Attached as **Exhibit S**); Angela Sauaia, et al., "Fatality and Severity of Firearm Injuries in a Denver Trauma Center, 2000–2013," 315 *JAMA* 2465 (June 14, 2016) (Attached as **Exhibit T**).

[37]*See* Dave Altimari, et al., "Shooter Paused and Six Escaped," *Hartford Courant*, December 23, 2012 (Attached as **Exhibit U**).

[38] Virginia Tech Review Panel, Mass Shootings at Virginia Tech, April 16, 2007: Report of the Virginia Tech Review Panel Presented to Governor Kaine, Commonwealth of Virginia, Revised with Addendum, November 2009, available at https://scholar.lib.vt.edu/prevail/docs/April16ReportRev20091204.pdf (last accessed February 1, 2023); "California Bar Shooting: Witnesses Describe Escaping as Gunman Reloaded," CBS News, December 7, 2018, available at https://www.cbsnews.com/news/borderline-bar-shooting-thousand-oaks-california-12-dead-witnesses-describe-gunman-storming-in (last accessed February 1, 2023).

to wrestle their weapon away from them) while they pause to reload.[39] In recent history, there have been numerous instances of gunmen being physically confronted by unarmed civilians while reloading, bringing their gun attacks to an abrupt end. Prominent examples include the 1993 Long Island Rail Road, the 2011 Tucson shopping center, the 2018 Nashville Waffle House, and the 2022 Laguna Woods church shooting rampages.[40] When there are pauses in the shooting to reload, opportunities arise for those in the line of fire to take life-saving action.

VI.C. BANS ON ASSAULT WEAPONS AND LCMS IN PRACTICE

40. In light of the growing threat posed by mass shootings, legislatures have enacted restrictions on assault weapons and LCMs in an effort to reduce the occurrence and lethality of such deadly acts of firearm violence. Prominent among these measures was the 1994 Federal Assault Weapons Ban. In September 1994, moved to action by high-profile shooting rampages that occurred the previous year at a San Francisco law firm and on a Long Island Rail Road commuter train, the U.S. Congress enacted a ban on assault weapons and LCMs that applied to all 50 states plus the District of Columbia, bringing the entire country under the ban.[41]

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[39] The longer a shooter can fire without interruption, the longer they can keep potential defenders at bay. The longer potential defenders are kept from physically confronting a shooter, the more opportunity there is for the shooter to inflict damage.

[40] *See*, Rich Schapiro, "LIRR Massacre 20 Years Ago: 'I Was Lucky,' Says Hero Who Stopped Murderer," *New York Daily News*, December 7, 2013, *available at* http://www.nydailynews.com/new-york/nyc-crime/lirr-massacre-20-years-lucky-hero-stopped-murderer-article-1.1540846 (last accessed February 1, 2023); Sam Quinones and Nicole Santa Cruz, "Crowd Members Took Gunman Down," *Los Angeles Times*, January 9, 2011, *available at* https://www.latimes.com/archives/la-xpm-2011-jan-09-la-na-arizona-shooting-heroes-20110110-story.html (last accessed February 1, 2023); Brad Schmitt, "Waffle House Hero: Could You Rush Toward a Gunman Who Just Killed People?" *The Tennessean*, April 24, 2018, *available at* https://www.tennessean.com/story/news/crime/2018/04/24/waffle-house-hero-could-you-rush-toward-gunman-who-just-killed-people/543943002 (last accessed February 1, 2023); "Parishioners Stop Gunman in Deadly California Church Attack," NPR, May 16, 2022, *available at* https://www.npr.org/2022/05/16/1099168335/parishioners-stop-gunman-in-california-church-shooting (last accessed February 1, 2023).

[41] Pub. L. No. 103-322, tit. XI, subtit. A, 108 Stat. 1796, 1996-2010 (codified as former 18 U.S.C. § 922(v), (w)(1) (1994)).

41. Like the state bans on assault weapons and LCMs that were implemented before it, the federal ban was aimed primarily at reducing mass shooting violence—an objective the ban sought to achieve by prohibiting the manufacture, importation, possession, and transfer of assault weapons and LCMs not legally owned by civilians prior to the date of the law's effect (September 13, 1994).[42] Congress, however, inserted a sunset provision in the law which allowed the federal ban to expire in exactly 10 years, if it was not renewed beforehand. As Congress ultimately chose not to renew the law, the federal ban expired on September 13, 2004. In the aftermath of the federal ban's expiration, mass shooting violence in the United States increased substantially.[43]

42. In 2023, following the mass shooting that occurred at a Fourth of July parade in Highland Park, IL, the Illinois legislature enacted statewide restrictions on assault weapons and LCMs. The legislative intent of Illinois is similar to that of other legislative bodies that have restricted assault weapons and LCMs: reducing gun violence, especially the frequency and lethality of mass shootings. Because, on average, the use of assault weapons and LCMs results in higher death tolls in mass shootings, the rationale for imposing restrictions on assault weapons and LCMs is to reduce the loss of life associated with the increased kill potential of such firearm technologies.

43. Currently, 30% of the U.S. population is subject to a ban on both assault weapons and LCMs. The following is a list of the ten state-level jurisdictions that presently restrict both assault weapons and LCMs: New Jersey (September 1, 1990); Hawaii (July 1, 1992, assault pistols only); Maryland (June 1, 1994, initially assault pistols but expanded to long guns October 1, 2013); Massachusetts (July 23, 1998); California (January 1, 2000); New York (November 1, 2000); the District of Columbia (March 31, 2009); Connecticut (April 4, 2013); Delaware

[42] Christopher Ingraham, "The Real Reason Congress Banned Assault Weapons in 1994—and Why It Worked," *Washington Post*, February 22, 2018, *available at* https://www.washingtonpost.com/news/wonk/wp/2018/02/22/the-real-reason-congress-banned-assault-weapons-in-1994-and-why-it-worked (last accessed January 2, 2023).

[43] *See* sources cited *supra* note 14.

(August 29, 2022); and Illinois (January 10, 2023).[44] As a reminder, from September 13, 1994, through September 12, 2004, the entire country was also subject to federal ban on both assault weapons and LCMs.

44. In the field of epidemiology, a common method for assessing the impact of laws and policies is to measure the rate of onset of new cases of an event, comparing the rate when and where the laws and policies were in effect against the rate when and where the laws and policies were not in effect. This measure, known as the incidence rate, allows public health experts to identify discernable differences, while accounting for variations in the population, over a set period of time. Relevant to the present case, calculating incidence rates across states, in a manner that captures whether or not bans on both assault weapons and LCMs were in effect during the period of observation, allows for the assessment of the effectiveness of such bans. In addition, fatality rates—the number of deaths, per population, that result from particular events across different jurisdictions—also provide insights into the impact bans on assault weapons and LCMs have on mass shooting violence.[45]

45. Since September 1, 1990, when New Jersey became the first state to ban both assault weapons and LCMs, through December 31, 2022, there have been 93 high-fatality mass shootings in the United States (**Exhibit C**).[46] Calculating incidence and fatality rates for this time-period, across jurisdictions with and without bans on both assault weapons and LCMs,

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[44] The dates in parentheses mark the effective dates on which the listed states became subject to bans on both assault weapons and LCMs.

[45] For purposes of this Declaration, incidence and fatality rates are calculated using methods and principles endorsed by the Centers for Disease Control. *See* Centers for Disease Control and Prevention, *Principles of Epidemiology in Public Health Practice: An Introduction to Applied Epidemiology and Biostatistics* (2012), *available at* https://stacks.cdc.gov/view/cdc/13178 (last accessed January 3, 2023).

[46] There were no state bans on both assault weapons and LCMs in effect prior to September 1, 1990. Therefore, January 1, 1991, is a logical starting point for an analysis of the impact of bans on assault weapons and LCMs. As there were no high-fatality mass shootings in the last four months of 1990, extending the analysis back to September 1, 1990, would make no difference.

reveals that states subject to such bans experienced a 56% decrease in high-fatality mass shooting incidence rates. They also experienced a 66% decrease in high-fatality mass shooting fatality rates, regardless of whether assault weapons or LCMs were used (Table 8).[47]

46. When calculations go a step further and are limited to mass shootings involving assault weapons or LCMs, the difference between the two jurisdictional categories is even more pronounced. In the time-period from January 1, 1991, through December 31, 2022, accounting for population, states with bans on both assault weapons and LCMs experienced a 62% decrease in the rate of high-fatality mass shootings involving the use of assault weapons or LCMs. Similarly, jurisdictions with such bans in effect experienced a 72% decrease in the rate of deaths resulting from high-fatality mass shootings perpetrated with assault weapons or LCMs (Table 8).

47. All of the above epidemiological calculations lead to the same conclusion: when bans on assault weapons and LCMs are in effect, per capita, fewer high-fatality mass shootings occur and fewer people die in such shootings—especially incidents involving assault weapons or LCMs, where the impact is most striking.

48. The main purpose of bans on assault weapons and LCMs is to restrict the availability of assault weapons and LCMs. The rationale is that, if there are fewer assault weapons and LCMs in circulation, then potential mass shooters will either be dissuaded from attacking or they will be forced to use less-lethal firearm technologies, resulting in fewer lives lost.

49. Moreover, forcing active shooters to reload creates critical pauses in an attack. These pauses provide opportunities for people in the line of fire to take life-saving measures (such as fleeing the area, taking cover out of the shooter's sight, and fighting back), which in turn can help reduce casualties.

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[47] Between September 13, 1994, and September 12, 2004, the Federal Assault Weapons Ban was in effect. During that 10-year period, all 50 states and the District of Columbia were under legal conditions that restricted assault weapons and LCMs. As such, the entire country is coded as being under a ban on both assault weapons and LCMs during the timeframe that the Federal Assault Weapons Ban was in effect.

50. The epidemiological data lend support to the policy choices of Illinois that seek to enhance public safety through restrictions on civilian access to certain firearms and magazines. While imposing constraints on assault weapons and LCMs will not prevent every mass shooting, the data suggest that legislative efforts to restrict such instruments of violence should result in lives being saved.

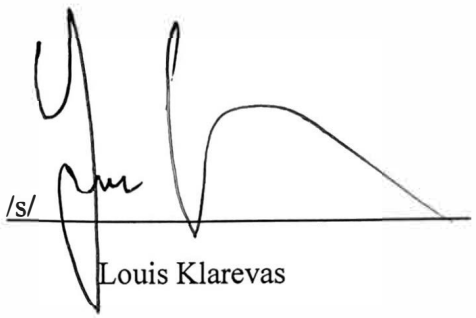
Table 8. Incidence and Fatality Rates for High-Fatality Mass Shootings, by Whether or Not Bans on Assault Weapons and LCMs Were in Effect, 1991-2022

	Annual Average Population (Millions)	Total Incidents	Annual Incidents per 100 Million Population	Total Deaths	Annual Deaths per 100 Million Population
All High-Fatality Mass Shootings					
Non-Ban States	162.0	68	1.31	720	13.89
Ban States	135.8	25	0.58	208	4.79
Percentage Decrease in Rate for Ban States			56%		66%
High-Fatality Mass Shootings Involving Assault Weapons or LCMs					
Non-Ban States	162.0	47	0.91	575	11.09
Ban States	135.8	15	0.35	135	3.11
Percentage Decrease in Rate for Ban States			62%		72%

Note: Population data are from U.S. Census Bureau, "Population and Housing Unit Estimates Datasets," *available at* https://www.census.gov/programs-surveys/popest/data/data-sets.html (last accessed January 3, 2023).

Pursuant to 28 U.S.C. § 1746, I declare under penalty of perjury under the laws of the United States of America that the foregoing is true and correct.

Executed on February 24, 2023, at Nassau County, New York.



Exhibit

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Associate Lecturer, Department of Global Affairs, University of Massachusetts – Boston, Boston, MA, 2015-2020

Senior Fulbright Scholar (Security Studies), Department of European and International Studies, University of Macedonia, Thessaloniki, Greece, 2011-2012

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Assistant Professor of Political Science, City University of New York – College of Staten Island, Staten Island, NY, 2003-2006

Associate Fellow, European Institute, London School of Economics and Political Science, London, England, UK, 2003-2004

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Consultant, National Joint Terrorism Task Force, Federal Bureau of Investigation, Washington, DC, 2015

Writer, Prometheus Books, Amherst, NY, 2012-2015

Consultant, United States Institute of Peace, Washington, DC, 2005, 2008-2009

Research Associate, United States Institute of Peace, Washington, DC, 1992-1998

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Courses Taught

Graduate
Counter-Terrorism and Homeland Security
International Political Economy
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International Security
Machinery and Politics of American Foreign Policy
Role of the United States in World Affairs
Security Policy
Theories of International Politics
Transnational Security
Transnational Terrorism
United States Foreign Policy

Undergraduate
American Government and Politics
European-Atlantic Relations
International Political Economy
International Relations
Transnational Terrorism
United States Foreign Policy

Scholarship

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"Were the Eagle and the Phoenix Birds of a Feather? The United States and the 1967 Greek Coup," *Diplomatic History*, June 2006

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"Careful How You Talk about Suicide, Mr. President," March 25, 2020 (co-authored with Sonali Rajan, Charles Branas, and Katherine Keyes)

"Only as Strong as Our Weakest Gun Laws: The Latest Mass Shooting Makes a Powerful Case for Federal Action," November 8, 2018

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"It's the Guns (and Ammo), Stupid: Dissuading Killers and Hardening Targets Matter Too, But Access to Weapons Matters Most," February 18, 2018

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"Improving the Justice System Following the Deaths of Michael Brown and Eric Garner," December 4, 2014

"American Greengemony: How the U.S. Can Help Ukraine and the E.U. Break Free from Russia's Energy Stranglehold," March 6, 2014

"Guns Don't Kill People, Dogs Kill People," October 17, 2013

"Romney the Liberal Internationalist?" October 23, 2012

"Romney's Unrealistic Foreign Policy Vision: National Security Funded by Money Growing Trees," October 10, 2012

"Do the Wrong Thing: Why Penn State Failed as an Institution," November 14, 2011

"Holding Egypt's Military to Its Pledge of Democratic Reform," February 11, 2011

"The Coming Twivolutions? Social Media in the Recent Uprisings in Tunisia and Egypt," January 31, 2011

"Scholarship Slavery: Does St. John's 'Dean of Mean' Represent a New Face of Human Trafficking?" October 6, 2010

"Misunderstanding Terrorism, Misrepresenting Islam," September 21, 2010

"Bombing on the Analysis of the Times Square Bomb Plot," May 5, 2010

"Do the Hutaree Militia Members Pose a Terrorist Threat?" May 4, 2010

"Addressing Mexico's Gun Violence One Extradition at a Time," March 29, 2010

"Terrorism in Texas: Why the Austin Plane Crash Is an Act of Terror," February 19, 2010

"Securing American Primacy by Tackling Climate Change: Toward a National Strategy of Greengemony," December 15, 2009

"Traffickers Without Borders: A 'Journey' into the Life of a Child Victimized by Sex Trafficking," November 17, 2009

"Beyond a Lingering Doubt: It's Time for a New Standard on Capital Punishment," November 9, 2009

"It's the Guns Stupid: Why Handguns Remain One of the Biggest Threats to Homeland Security," November 7, 2009

"Obama Wins the 2009 Nobel Promise Prize," October 9, 2009

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"The White House's Benghazi Problem," September 20, 2012

"Greeks Don't Want a Grexit," June 14, 2012

"The Earthquake in Greece," May 7, 2012

"The Idiot Jihadist Next Door," December 1, 2011

"Locked Up Abroad," October 4, 2011

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"What the U.N. Can Do To Stop Getting Attacked by Terrorists," September 2, 2011

"Is It Completely Nuts That the British Police Don't Carry Guns? Maybe Not," August 13, 2011

"How Obama Could Have Stayed the Execution of Humberto Leal Garcia," July 13, 2011

"After Osama bin Laden: Will His Death Hasten Al Qaeda's Demise?" May 2, 2011

"Libya's Stranger Soldiers: How To Go After Qaddafi's Mercenaries," February 28, 2011

"Closing the Gap: How To Reform U.S. Gun Laws To Prevent Another Tucson," January 13, 2011

"Easy Target," June 13, 2010

"Death Be Not Proud," October 27, 2003 (correspondence)

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"Human Trafficking and the Child Protection Compact Act of 2009," *Writ* (FindLaw.com), July 15, 2009 (co-authored with Christine Buckley)

"Can the Justice Department Prosecute Reporters Who Publish Leaked Classified Information? Interpreting the Espionage Act," *Writ* (FindLaw.com), June 9, 2006

"Will the Precedent Set by the Indictment in a Pentagon Leak Case Spell Trouble for Those Who Leaked Valerie Plame's Identity to the Press?" *Writ* (FindLaw.com), August 15, 2005

"Jailing Judith Miller: Why the Media Shouldn't Be So Quick to Defend Her, and Why a Number of These Defenses Are Troubling," *Writ* (FindLaw.com), July 8, 2005

"The Supreme Court Dismisses the Controversial Consular Rights Case: A Blessing in Disguise for International Law Advocates?" *Writ* (FindLaw.com), June 6, 2005 (co-authored with Howard S. Schiffman)

"The Decision Dismissing the Lawsuit against Vice President Dick Cheney," *Writ* (FindLaw.com), May 17, 2005

"The Supreme Court Considers the Rights of Foreign Citizens Arrested in the United States," *Writ* (FindLaw.com), March 21, 2005 (co-authored with Howard S. Schiffman)

Presentations and Addresses

In addition to the presentations listed below, I have made close to one hundred media appearances, book events, and educational presentations (beyond lectures for my own classes)

"Mass Shootings: What We Know, What We Don't Know, and Why It All Matters," keynote presentation to be delivered at the Columbia University Center for Injury Science and Prevention Annual Symposium, virtual meeting, May 2020

"K-12 School Environmental Responses to Gun Violence: Gaps in the Evidence," paper presented at Society for Advancement of Violence and Injury Research Annual Meeting, virtual meeting, April 2020 (co-authored with Sonali Rajan, Joseph Erardi, Justin Heinze, and Charles Branas)

"Active School Shootings," Post-Performance Talkback following Presentation of *17 Minutes*, Barrow Theater, New York, January 29, 2020 (co-delivered with Sonali Rajan)

"Addressing Mass Shootings in Public Health: Lessons from Security Studies," Teachers College, Columbia University, November 25, 2019

"Rampage Nation: Securing America from Mass Shootings," Swarthmore College, October 24, 2019

"Rampage Nation: Securing America from Mass Shootings," University of Pennsylvania, February 9, 2018

"Treating Mass Shootings for What They Really Are: Threats to American Security," Framingham State University, October 26, 2017

"Book Talk: Rampage Nation," Teachers College, Columbia University, October 17, 2017

Participant, Roundtable on Assault Weapons and Large-Capacity Magazines, Annual Conference on Second Amendment Litigation and Jurisprudence, Law Center to Prevent Gun Violence, October 16, 2017

"Protecting the Homeland: Tracking Patterns and Trends in Domestic Terrorism," address delivered to the annual meeting of the National Joint Terrorism Task Force, June 2015

"Sovereign Accountability: Creating a Better World by Going after Bad Political Leaders," address delivered to the Daniel H. Inouye Asia-Pacific Center for Security Studies, November 2013

"Game Theory and Political Theater," address delivered at the School of Drama, State Theater of Northern Greece, May 2012

"Holding Heads of State Accountable for Gross Human Rights Abuses and Acts of Aggression," presentation delivered at the Michael and Kitty Dukakis Center for Public and Humanitarian Service, American College of Thessaloniki, May 2012

Chairperson, Cultural Enrichment Seminar, Fulbright Foundation – Southern Europe, April 2012

Participant, Roundtable on "Did the Intertubes Topple Hosni?" Zócalo Public Square, February 2011

Chairperson, Panel on Democracy and Terrorism, annual meeting of the International Security Studies Section of the International Studies Association, October 2010

"Trends in Terrorism Within the American Homeland Since 9/11," paper to be presented at the annual meeting of the International Security Studies Section of the International Studies Association, October 2010

Panelist, "In and Of the World," Panel on Global Affairs in the 21st Century, Center for Global Affairs, New York University, March 2010

Moderator, "Primacy, Perils, and Players: What Does the Future Hold for American Security?" Panel of Faculty Symposium on Global Challenges Facing the Obama Administration, Center for Global Affairs, New York University, March 2009

"Europe's Broken Border: The Problem of Illegal Immigration, Smuggling and Trafficking via Greece and the Implications for Western Security," presentation delivered at the Center for Global Affairs, New York University, February 2009

"The Dangers of Democratization: Implications for Southeast Europe," address delivered at the University of Athens, Athens, Greece, May 2008

Participant, "U.S. National Intelligence: The Iran National Intelligence Estimate," Council on Foreign Relations, New York, April 2008

Moderator, First Friday Lunch Series, "Intelligence in the Post-9/11 World: An Off-the-Record Conversation with Dr. Joseph Helman (U.S. Senior National Intelligence Service)," Center for Global Affairs, New York University, March 2008

Participant, "U.S. National Intelligence: Progress and Challenges," Council on Foreign Relations, New York, March 2008

Moderator, First Friday Lunch Series, "Public Diplomacy: The Steel Backbone of America's Soft Power: An Off-the-Record Conversation with Dr. Judith Baroody (U.S. Department of State)," Center for Global Affairs, New York University, October 2007

"The Problems and Challenges of Democratization: Implications for Latin America," presentation delivered at the Argentinean Center for the Study of Strategic and International Relations Third Conference on the International Relations of South America (IBERAM III), Buenos Aires, Argentina, September 2007

"The Importance of Higher Education to the Hellenic-American Community," keynote address to the annual Pan-Icarian Youth Convention, New York, May 2007

Moderator, First Friday Lunch Series, Panel Spotlighting Graduate Theses and Capstone Projects, Center for Global Affairs, New York University, April 2007

Convener, U.S. Department of State Foreign Officials Delegation Working Group on the Kurds and Turkey, March 2007

"Soft Power and International Law in a Globalizing Latin America," round-table presentation delivered at the Argentinean Center for the Study of Strategic and International Relations Twelfth Conference of Students and Graduates of International Relations in the Southern Cone (CONOSUR XII), Buenos Aires, Argentina, November 2006

Moderator, First Friday Lunch Series, "From Berkeley to Baghdad to the Beltway: An Off-the-Record Conversation with Dr. Catherine Dale (U.S. Department of Defense)," Center for Global Affairs, New York University, November 2006

Chairperson, Roundtable on Presidential Privilege and Power Reconsidered in a Post-9/11 Era, American Political Science Association Annual Meeting, September 2006

"Constitutional Controversies," round-table presentation delivered at City University of New York-College of Staten Island, September 2005

"The Future of the Cyprus Conflict," address to be delivered at City University of New York College of Staten Island, April 2005

"The 2004 Election and the Future of American Foreign Policy," address delivered at City University of New York College of Staten Island, December 2004

"One Culprit for the 9/11 Attacks: Political Realism," address delivered at City University of New York-College of Staten Island, September 2004

"Were the Eagle and the Phoenix Birds of a Feather? The United States and the 1967 Greek Coup," address delivered at London School of Economics, November 2003

"Beware of Europeans Bearing Gifts? Cypriot Accession to the EU and the Prospects for Peace," address delivered at Conference on Mediterranean Stability, Security, and Cooperation, Austrian Defense Ministry, Vienna, Austria, October 2003

Co-Chair, Panel on Ideational and Strategic Aspects of Greek International Relations, London School of Economics Symposium on Modern Greece, London, June 2003

"Greece between Old and New Europe," address delivered at London School of Economics, June 2003

Co-Chair, Panel on International Regimes and Genocide, International Association of Genocide Scholars Annual Meeting, Galway, Ireland, June 2003

"American Cooperation with International Tribunals," paper presented at the International Association of Genocide Scholars Annual Meeting, Galway, Ireland, June 2003

"Is the Unipolar Moment Fading?" address delivered at London School of Economics, May 2003

"Cyprus, Turkey, and the European Union," address delivered at London School of Economics, February 2003

"Bridging the Greek-Turkish Divide," address delivered at Northwestern University, May 1998

"The CNN Effect: Fact or Fiction?" address delivered at Catholic University, April 1998

"The Current Political Situation in Cyprus," address delivered at AMIDEAST, July 1997

"Making the Peace Happen in Cyprus," presentation delivered at the U.S. Institute of Peace in July 1997

"The CNN Effect: The Impact of the Media during Diplomatic Crises and Complex Emergencies," a series of presentations delivered in Cyprus (including at Ledra Palace), May 1997

"Are Policy-Makers Misreading the Public? American Public Opinion on the United Nations," paper presented at the International Studies Association Annual Meeting, Toronto, Canada, March 1997 (with Shoon Murray)

"The Political and Diplomatic Consequences of Greece's Recent National Elections," presentation delivered at the National Foreign Affairs Training Center, Arlington, VA, September 1996

"Prospects for Greek-Turkish Reconciliation," presentation delivered at the U.S. Institute of Peace Conference on Greek-Turkish Relations, Washington, D.C., June, 1996 (with Theodore A. Couloumbis)

"Greek-Turkish Reconciliation," paper presented at the Karamanlis Foundation and Fletcher School of Diplomacy Joint Conference on The Greek-U.S. Relationship and the Future of Southeastern Europe, Washington, D.C., May, 1996 (with Theodore A. Couloumbis)

"The Path toward Peace in the Eastern Mediterranean and the Balkans in the Post-Cold War Era," paper presented at the International Studies Association Annual Meeting, San Diego, CA, March, 1996 (with Theodore A. Couloumbis)

"Peace Operations: The View from the Public," paper presented at the International Studies Association Annual Meeting, San Diego, CA, March, 1996

Chairperson, Roundtable on Peace Operations, International Security Section of the International Studies Association Annual Meeting, Rosslyn, VA, October, 1995

"Chaos and Complexity in International Politics: Epistemological Implications," paper presented at the International Studies Association Annual Meeting, Washington, D.C., March, 1994

"At What Cost? American Mass Public Opinion and the Use of Force Abroad," paper presented at the International Studies Association Annual Meeting, Washington, D.C., March, 1994 (with Daniel B. O'Connor)

"American Mass Public Opinion and the Use of Force Abroad," presentation delivered at the United States Institute of Peace, Washington, D.C., February, 1994 (with Daniel B. O'Connor)

"For a Good Cause: American Mass Public Opinion and the Use of Force Abroad," paper presented at the Annual Meeting of the Foreign Policy Analysis/Midwest Section of the International Studies Association, Chicago, IL, October, 1993 (with Daniel B. O'Connor)

"American International Narcotics Control Policy: A Critical Evaluation," presentation delivered at the American University Drug Policy Forum, Washington, D.C., November, 1991

"American National Security in the Post-Cold War Era: Social Defense, the War on Drugs, and the Department of Justice," paper presented at the Association of Professional Schools of International Affairs Conference, Denver, CO, February, 1991

Referee for Grant Organizations, Peer-Reviewed Journals, and Book Publishers

National Science Foundation, Division of Social and Economic Sciences

American Journal of Preventive Medicine

American Journal of Public Health

American Political Science Review

British Medical Journal (BMJ)

Comparative Political Studies

Injury Epidemiology

Journal of Public and International Affairs

Millennium

Political Behavior

Presidential Studies Quarterly

Victims & Offenders

Violence and Victims

Brill Publishers

Johns Hopkins University Press

Routledge

Service to University, Profession, and Community

Participant, Minnesota Chiefs of Police Association, Survey of Measures to Reduce Gun Violence, 2023

Member, Regional Gun Violence Research Consortium, Nelson A. Rockefeller Institute of Government, State University of New York, 2022-

Founding Member, Scientific Union for the Reduction of Gun Violence (SURGE), Columbia University, 2019-

Contributing Lecturer, Johns Hopkins University, Massive Open Online Course on Evidence-Based Gun Violence Research, Funded by David and Lucile Packard Foundation, 2019

Member, Group of Gun Violence Experts, *New York Times* Upshot Survey, 2017

Member, Guns on Campus Assessment Group, Johns Hopkins University and Association of American Universities, 2016

Member, Fulbright Selection Committee, Fulbright Foundation, Athens, Greece, 2012

Faculty Advisor, Global Affairs Graduate Society, New York University, 2009-2011

Founder and Coordinator, Graduate Transnational Security Studies, Center for Global Affairs, New York University, 2009-2011

Organizer, Annual Faculty Symposium, Center for Global Affairs, New York University, 2009

Member, Faculty Search Committees, Center for Global Affairs, New York University, 2007-2009

Member, Graduate Program Director Search Committee, Center for Global Affairs, New York University, 2008-2009

Developer, Transnational Security Studies, Center for Global Affairs, New York University, 2007-2009

Participant, Council on Foreign Relations Special Series on National Intelligence, New York, 2008

Member, Graduate Certificate Curriculum Committee, Center for Global Affairs, New York University, 2008

Member, Faculty Affairs Committee, New York University, 2006-2008

Member, Curriculum Review Committee, Center for Global Affairs, New York University, 2006-2008

Member, Overseas Study Committee, Center for Global Affairs, New York University, 2006-2007

Participant, New York Academic Delegation to Israel, Sponsored by American-Israel Friendship League, 2006

Member, Science, Letters, and Society Curriculum Committee, City University of New York-College of Staten Island, 2006

Member, Graduate Studies Committee, City University of New York-College of Staten Island, 2005-2006

Member, Summer Research Grant Selection Committee, City University of New York-College of Staten Island, 2005

Director, College of Staten Island Association, 2004-2005

Member of Investment Committee, College of Staten Island Association, 2004-2005

Member of Insurance Committee, College of Staten Island Association, 2004-2005

Member, International Studies Advisory Committee, City University of New York-College of Staten Island, 2004-2006

Faculty Advisor, Pi Sigma Alpha National Political Science Honor Society, City University of New York-College of Staten Island, 2004-2006

Participant, World on Wednesday Seminar Series, City University of New York-College of Staten Island, 2004-2005

Participant, American Democracy Project, City University of New York-College of Staten Island, 2004

Participant, Philosophy Forum, City University of New York-College of Staten Island, 2004

Commencement Liaison, City University of New York-College of Staten Island, 2004

Member of Scholarship Committee, Foundation of Pan-Icarian Brotherhood, 2003-2005, 2009

Scholarship Chairman, Foundation of Pan-Icarian Brotherhood, 2001-2003

Faculty Advisor to the Kosmos Hellenic Society, George Washington University, 2001-2002

Member of University of Pennsylvania's Alumni Application Screening Committee, 2000-2002

Participant in U.S. Department of State's International Speakers Program, 1997

Participant in Yale University's United Nations Project, 1996-1997

Member of Editorial Advisory Board, *Journal of Public and International Affairs*, Woodrow Wilson School of Public and International Affairs, Princeton University, 1991-1993

Voting Graduate Student Member, School of International Service Rank and Tenure Committee, American University, 1990-1992

Member of School of International Service Graduate Student Council, American University, 1990-1992

Teaching Assistant for the Several Courses (World Politics, Beyond Sovereignty, Between Peace and War, Soviet-American Security Relations, and Organizational Theory) at School of International Service Graduate Student Council, American University, 1989-1992

Representative for American University at the Annual Meeting of the Association of Professional Schools of International Affairs, Denver, Colorado, 1991

Expert Witness Service

Expert for State of Hawaii, *National Association for Gun Rights, et al. v. Shikada*, United States District Court for the District of Hawaii, Case Number 22-cv-00404-DKW-RT, Honolulu, HI, 2023-

Expert for State of Hawaii, *Abbott v. Lopez*, United States District Court for the District of Hawaii, Case Number 20-cv-00360-RT, Honolulu, HI, 2023-

Expert for State of Illinois, *Harrel v. Raoul*, United States District Court for Southern District of Illinois, Case Number 23-cv-141-SPM, East St. Louis, IL, 2023-

Expert for State of Illinois, *Langley v. Kelly*, United States District Court for Southern District of Illinois, Case Number 23-cv-192-NJR, East St. Louis, IL, 2023-

Expert for State of Illinois, *Barnett v. Raoul*, United States District Court for Southern District of Illinois, Case Number 23-cv-209-RJD, Benton, IL, 2023-

Expert for State of Illinois, *Federal Firearms Licensees of Illinois v. Pritzker*, United States District Court for Southern District of Illinois, Case Number 23-cv-215-NJR, East St. Louis, IL, 2023-

Expert for State of Illinois, *Herrera v. Raoul*, United States District Court for Northern District of Illinois, Case Number 23-cv-532, Chicago, IL, 2023-

Expert for State of Oregon, *Oregon Firearms Federation, Inc., et al. v. Kotek, et al.*, United States District Court for the District of Oregon, Case Number 22-cv-01815-IM, Portland, OR, 2023-

Expert for State of Oregon, *Fitz, et al. v. Rosenblum, et al.*, United States District Court for the District of Oregon, Case Number 22-cv-01859-IM, Portland, OR, 2023-

Expert for State of Oregon, *Eyre, et al. v. Rosenblum, et al.*, United States District Court for the District of Oregon, Case Number 22-cv-01862-IM, Portland, OR, 2023-

Expert for State of Oregon, *Azzopardi, et al. v. Rosenblum, et al.*, United States District Court for the District of Oregon, Case Number 22-cv-01869-IM, Portland, OR, 2023-

Expert for State of Connecticut, *National Association for Gun Rights, et al. v. Lamont, et al.*, United States District Court for the District of Connecticut, Case Number 22-cv-01118-JBA, Hartford, CT, 2023-

Expert for State of Massachusetts, *National Association for Gun Rights and Capen v. Campbell*, United States District Court for the District of Massachusetts, Case Number 22-cv-11431-FDS, Boston, MA, 2023-

Expert for City of Highland Park, Illinois, *National Association for Gun Rights and Goldman v. Highland Park*, United States District Court for Northern District of Illinois, Case Number 22-cv-04774, Chicago, IL, 2022-

Expert for State of Colorado, *Gates, et al. v. Polis*, United States District Court for District of Colorado, 22-cv-01866-NYW-SKC, Denver, CO, 2022-

Expert for State of Washington, *Brumback and Gimme Guns v. Ferguson, et al.*, United States District Court for Eastern District of Washington, Case Number 22-cv-03093-MKD, Yakima, WA, 2022-

Expert for State of Washington, *Sullivan, et al. v. Ferguson, et al.*, United States District Court for Western District of Washington, Case Number, 22-cv-05403-DGE, Seattle, WA, 2022-

Expert for State of California, *Rupp v. Bonta*, United States District Court for Eastern District of California, Case Number 17-cv-00903-WBS-KJN, Sacramento, CA, 2022-

Expert for County of Cook, Illinois, *Viramontes v. County of Cook, IL*, United States District Court for Northern District of Illinois, Case Number 21-cv-04595, Chicago, IL, 2022-

Expert for Government of Canada, *Parker and K.K.S. Tactical Supplies Ltd. v. Attorney General of Canada*, Federal Court, Court File No.: T-569-20, 2021-

Expert for Government of Canada, *Canadian Coalition for Firearm Rights, et al. v. Attorney General of Canada*, Federal Court, Court File No.: T-577-20, 2021-

Expert for Government of Canada, *Hipwell v. Attorney General of Canada*, Federal Court, Court File No.: T-581-20, 2021-

Expert for Government of Canada, *Doherty, et al. v. Attorney General of Canada*, Federal Court, Court File No.: T-677-20, 2021-

Expert for Government of Canada, *Generoux, et al. v. Attorney General of Canada*, Federal Court, Court File No.: T-735-20, 2021-

Expert for Government of Canada, *Eichenberg, et al. v. Attorney General of Canada*, Federal Court, Court File No.: T-905-20, 2021-

Expert for State of California, *Nguyen v. Bonta*, United States District Court for Southern District of California, Case Number 20-cv-02470-WQH-MDD, San Diego, CA, 2021-

Expert for State of California, *Jones v. Bonta*, United States District Court for Southern District of California, Case Number 19-cv-01226-L-AHG, San Diego, CA, 2021-

Expert for State of California, *Miller v. Becerra*, United States District Court for Southern District of California, Case Number 19-cv-1537-BEN-JLB, San Diego, CA, 2019-

Expert for Plaintiffs, *Ward et al. v. Academy Sports + Outdoor*, District Court Bexar County, Texas, 224th Judicial District, Cause Number 2017CI23341, Bexar County, TX, 2019-2019

Expert for State of California, *Duncan v. Becerra*, United States District Court for Southern District of California, Case Number 17-cv-1017-BEN-JLB, San Diego, CA, 2017-

Expert for State of California, *Wiese v. Becerra*, United States District Court for Eastern District of California, Case Number 17-cv-00903-WBS-KJN, Sacramento, CA, 2017-

Expert for State of Colorado, *Rocky Mountain Gun Owners v. Hickenlooper*, District Court for County and City of Denver, Colorado, Case Number 2013CV33879, Denver, CO, 2016-2017

Affiliations, Associations, and Organizations (Past and Present)

Academy of Political Science (APS)

American Political Science Association (APSA)

Anderson Society of American University

Carnegie Council Global Ethics Network

Columbia University Scientific Union for the Reduction of Gun Violence (SURGE)

Firearm Safety among Children and Teens (FACTS)

International Political Science Association (IPSA)

International Studies Association (ISA)

New York Screenwriters Collective

Pan-Icarian Brotherhood

Pi Sigma Alpha

Regional Gun Violence Research Consortium

Society for Advancement of Violence and Injury Research (SAVIR)

United States Department of State Alumni Network

United States Institute of Peace Alumni Association

University of Pennsylvania Alumni Association

Grants, Honors, and Awards

Co-Investigator, A Nationwide Case-Control Study of Firearm Violence Prevention Tactics and Policies in K-12 School, National Institutes of Health, 2021-2024 (Branas and Rajan MPIs)

Senior Fulbright Fellowship, 2012

Professional Staff Congress Research Grantee, City University of New York, 2004-2005

Research Assistance Award (Two Times), City University of New York-College of Staten Island, 2004

Summer Research Fellowship, City University of New York-College of Staten Island, 2004

European Institute Associate Fellowship, London School of Economics, 2003-2004

Hellenic Observatory Defense Analysis Research Fellowship, London School of Economics, 2002-2003

United States Institute of Peace Certificate of Meritorious Service, 1996

National Science Foundation Dissertation Research Grant, 1995 (declined)

Alexander George Award for Best Graduate Student Paper, Runner-Up, Foreign Policy Analysis Section, International Studies Association, 1994

Dean's Scholar Fellowship, School of International Service, American University, 1989-1992

Graduate Research and Teaching Assistantship, School of International Service, American University, 1989-1992

American Hellenic Educational Progressive Association (AHEPA) College Scholarship, 1986

Political Science Student of the Year, Wilkes-Barre Area School District, 1986

Exhibit

LOUIS KLAREVAS

RAMPAGE NATION

SECURING AMERICA FROM MASS SHOOTINGS

Prometheus Books
59 John Glenn Drive
Amherst, New York 14228

Table 2.1. The Concept of a Mass Shooting.

Definition of a Mass Shooting:

Any violent attack that results in four or more individuals incurring gunshot wounds.

Categories of Mass Shooting:

1. *Nonfatal*
   Mass shootings in which no one dies.

2. *Fatal*
   Mass shootings in which at least one victim dies.

3. *High-Fatality / Gun Massacre*
   Mass shootings in which six or more victims die.

It's easy to dismiss conceptual discussions and debates as exercises in Ivory Tower intellectualism. But how we identify and think about mass shootings impacts which attacks capture national attention and which are disregarded—something which has far-reaching policy consequences. Thus, coming up with the best possible definition and conceptualization is a vital first step toward explaining and preventing rampage violence. As the Socratic adage reminds us, "The beginning of wisdom is the definition of terms."[43]

Exhibit

Exhibit C
High-Fatality Mass Shootings in the United States, 1991-2022

	Date	City	State	Deaths	Involved AWs (1994 U.S. Definition)	Involved LCMs (1994 U.S. Definition)	Involved LCMs (2023 Ill. Definition)
1	1/26/1991	Chimayo	NM	7	N	N	N
2	8/9/1991	Waddell	AZ	9	N	N	N
3	10/16/1991	Killeen	TX	23	N	Y	Y
4	11/7/1992	Morro Bay and Paso Robles	CA	6	N	N	N
5	1/8/1993	Palatine	IL	7	N	N	N
6	5/16/1993	Fresno	CA	7	Y	Y	Y
7	7/1/1993	San Francisco	CA	8	Y	Y	Y
8	12/7/1993	Garden City	NY	6	N	Y	N
9	4/20/1999	Littleton	CO	13	Y	Y	Y
10	7/12/1999	Atlanta	GA	6	N	U	U
11	7/29/1999	Atlanta	GA	9	N	Y	Y
12	9/15/1999	Fort Worth	TX	7	N	Y	N
13	11/2/1999	Honolulu	HI	7	N	Y	Y
14	12/26/2000	Wakefield	MA	7	Y	Y	Y
15	12/28/2000	Philadelphia	PA	7	N	Y	N
16	8/26/2002	Rutledge	AL	6	N	N	N
17	1/15/2003	Edinburg	TX	6	Y	U	U
18	7/8/2003	Meridian	MS	6	N	N	N
19	8/27/2003	Chicago	IL	6	N	N	N
20	3/12/2004	Fresno	CA	9	N	N	N
21	11/21/2004	Birchwood	WI	6	Y	Y	Y
22	3/12/2005	Brookfield	WI	7	N	Y	N
23	3/21/2005	Red Lake	MN	9	N	Y	N
24	1/30/2006	Goleta	CA	7	N	Y	N
25	3/25/2006	Seattle	WA	6	N	N	N
26	6/1/2006	Indianapolis	IN	7	Y	Y	Y
27	12/16/2006	Kansas City	KS	6	N	N	N
28	4/16/2007	Blacksburg	VA	32	N	Y	N
29	10/7/2007	Crandon	WI	6	Y	Y	Y
30	12/5/2007	Omaha	NE	8	Y	Y	Y
31	12/24/2007	Carnation	WA	6	N	U	U
32	2/7/2008	Kirkwood	MO	6	N	Y	N
33	9/2/2008	Alger	WA	6	N	U	U
34	12/24/2008	Covina	CA	8	N	Y	Y
35	1/27/2009	Los Angeles	CA	6	N	N	N

	Date	City	State	Deaths	Involved AWs (1994 U.S. Definition)	Involved LCMs (1994 U.S. Definition)	Involved LCMs (2023 Ill. Definition)
36	3/10/2009	Kinston, Samson, and Geneva	AL	10	Y	Y	Y
37	3/29/2009	Carthage	NC	8	N	N	N
38	4/3/2009	Binghamton	NY	13	N	Y	Y
39	11/5/2009	Fort Hood	TX	13	N	Y	Y
40	1/19/2010	Appomattox	VA	8	Y	Y	Y
41	8/3/2010	Manchester	CT	8	N	Y	Y
42	1/8/2011	Tucson	AZ	6	N	Y	Y
43	7/7/2011	Grand Rapids	MI	7	N	Y	N
44	8/7/2011	Copley Township	OH	7	N	N	N
45	10/12/2011	Seal Beach	CA	8	N	N	N
46	12/25/2011	Grapevine	TX	6	N	N	N
47	4/2/2012	Oakland	CA	7	N	N	N
48	7/20/2012	Aurora	CO	12	Y	Y	Y
49	8/5/2012	Oak Creek	WI	6	N	Y	Y
50	9/27/2012	Minneapolis	MN	6	N	Y	N
51	12/14/2012	Newtown	CT	27	Y	Y	Y
52	7/26//2013	Hialeah	FL	6	N	Y	Y
53	9/16/2013	Washington	DC	12	N	N	N
54	7/9/2014	Spring	TX	6	N	Y	N
55	9/18/2014	Bell	FL	7	N	U	U
56	2/26/2015	Tyrone	MO	7	N	U	U
57	5/17/2015	Waco	TX	9	N	Y	Y
58	6/17/2015	Charleston	SC	9	N	Y	N
59	8/8/2015	Houston	TX	8	N	U	U
60	10/1/2015	Roseburg	OR	9	N	Y	N
61	12/2/2015	San Bernardino	CA	14	Y	Y	Y
62	2/21/2016	Kalamazoo	MI	6	N	Y	N
63	4/22/2016	Piketon	OH	8	N	U	U
64	6/12/2016	Orlando	FL	49	Y	Y	Y
65	5/27/2017	Brookhaven	MS	8	Y	Y	Y
66	9/10/2017	Plano	TX	8	Y	Y	Y
67	10/1/2017	Las Vegas	NV	60	Y	Y	Y
68	11/5/2017	Sutherland Springs	TX	25	Y	Y	Y
69	2/14/2018	Parkland	FL	17	Y	Y	Y
70	5/18/2018	Santa Fe	TX	10	N	N	N
71	10/27/2018	Pittsburgh	PA	11	Y	Y	Y
72	11/7/2018	Thousand Oaks	CA	12	N	Y	Y
73	5/31/2019	Virginia Beach	VA	12	N	Y	N

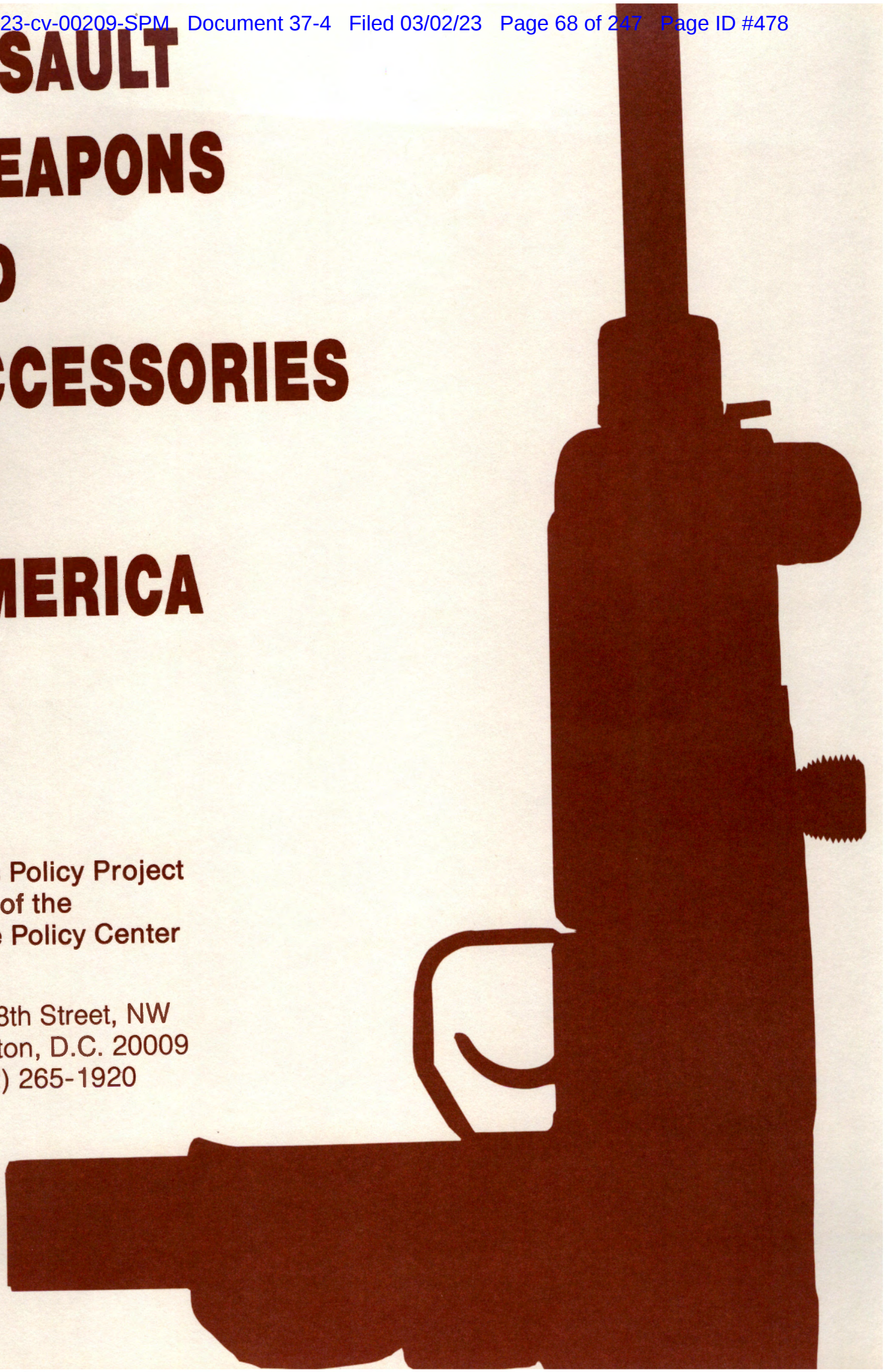
	Date	City	State	Deaths	Involved AWs (1994 U.S. Definition)	Involved LCMs (1994 U.S. Definition)	Involved LCMs (2023 Ill. Definition)
74	8/3/2019	El Paso	TX	23	Y	Y	Y
75	8/4/2019	Dayton	OH	9	Y	Y	Y
76	8/31/2019	Midland and Odessa	TX	7	Y	Y	Y
77	3/15/2020	Moncure	NC	6	U	U	U
78	6/4/2020	Valhermoso Springs	AL	7	Y	Y	Y
79	9/7/2020	Aguanga	CA	7	U	U	U
80	2/2/2021	Muskogee	OK	6	N	U	U
81	3/16/2021	Acworth and Atlanta	GA	8	N	Y	Y
82	3/22/2021	Boulder	CO	10	Y	Y	Y
83	4/7/2021	Rock Hill	SC	6	Y	Y	Y
84	4/15/2021	Indianapolis	IN	8	Y	Y	Y
85	5/9/2021	Colorado Springs	CO	6	N	Y	N
86	5/26/2021	San Jose	CA	9	N	Y	N
87	1/23/2022	Milwaukee	WI	6	N	U	U
88	4/3/2022	Sacramento	CA	6	N	Y	Y
89	5/14/2022	Buffalo	NY	10	Y	Y	Y
90	5/24/2022	Uvalde	TX	21	Y	Y	Y
91	7/4/2022	Highland Park	IL	7	Y	Y	Y
92	10/27/2022	Broken Arrow	OK	7	N	U	U
93	11/22/2022	Chesapeake	VA	6	N	U	U

Note: High-fatality mass shootings are mass shootings resulting in 6 or more fatalities, not including the perpetrator(s), regardless of location or motive. For purposes of this Exhibit, a high-fatality mass shooting was coded as involving an assault weapon if at least one of the firearms discharged was defined as an assault weapon in (1) the 1994 federal Assault Weapons Ban or (2) the statutes of the state where the shooting occurred. For purposes of this Exhibit, a high-fatality mass shooting was coded as involving a large-capacity magazine in two different ways. Under the 1994 federal definition, an ammunition-feeding device was coded as an LCM if at least one of the firearms discharged had an ammunition-feeding device with a capacity of more than 10 bullets. Under the 2023 Illinois definition, an ammunition-feeding device was coded as an LCM if at least one of the long guns discharged had an ammunition-feeding device with a capacity of more than 10 bullets or if at least on the handguns discharged had an ammunition-feeding device with a capacity of more than 15 bullets. Incidents in gray shade are those incidents that occurred at a time when and in a state where legal prohibitions on both assault weapons and large-capacity magazines were in effect statewide or nationwide.

Sources: Louis Klarevas, *Rampage Nation: Securing America from Mass Shootings* (2016); Louis Klarevas, et al., *The Effect of Large-Capacity Magazine Bans on High-Fatality Mass Shootings*, 109 American Journal of Public Health 1754 (2019), *available at* https://ajph.aphapublications.org/doi/full/10.2105/AJPH.2019.305311 (last accessed December 27, 2022); and "Gun Violence Archive," *available at* https://www.gunviolencearchive.org (last accessed January 3, 2023). The Gun Violence Archive was only consulted for identifying high-fatality mass shootings that occurred since January 1, 2018.

Exhibit

ASSAULT WEAPONS AND ACCESSORIES IN AMERICA



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Assault Weapons and Accessories in America

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TABLE OF CONTENTS

Introduction	p. 1
Assault Weapons Violence	p. 2
Drug Traffickers, Paramilitary Groups...	p. 5
And Just Plain Folk	p. 8
Assault Weapons Marketing	p. 9
Assault Weapon Look-Alikes: Airguns and Toy Guns	p. 10
Publications	p. 11
Accessories	p. 14
Paramilitary Training Camps and Combat Schools	p. 19
The Assault Weapons Debate	p. 21
Conclusion	p. 26
Appendix I	p. 30
Appendix II	p. 32
Footnotes	p. 34

INTRODUCTION

Across America, the firepower in the hands of gun owners of varying stripes is increasing dramatically. The reason: assault weapons. Drug traffickers are finding that assault weapons--in addition to 'standard issue' handguns--provide the extra firepower necessary to fight police and competing dealers. Right-wing paramilitary extremists, in their ongoing battle against the "Zionist Occupational Government," have made these easily purchased firearms their gun of choice. And rank and file gun aficionados--jaded with handguns, shotguns, and hunting rifles--are moving up to the television glamour and movie sex appeal of assault weapons. The growing market for these weapons--coupled with a general rising interest in the non-sporting use of firearms--has generated an industry of publications, catalogs, accessories, training camps, and combat schools dedicated to meeting its needs.

Assault weapons are growing in popularity for a variety of reasons. For manufacturers, assault weapons are a necessary new product line in the wake of the mid-1980s decline in handgun sales. Yet, manufacturers didn't create a market, they recognized one. For criminals, the weapons look intimidating, have increased firepower, and can be purchased under the same controls as a hunting rifle or shotgun: that is, virtually none. For survivalists who envision themselves fending off a horde of desperate neighbors from their bomb shelters, the high ammunition capacity and other anti-personnel capabilities of assault weapons are exactly what is needed. And for fans of Rambo and "Miami Vice," assault weapons offer the look and feel of the real thing. Not surprisingly, this shift to increased firepower--in both criminal and law-abiding hands--has law enforcement worried.

The assault weapons threat is exacerbated by the fact that the weapons are difficult to define in legal terms. Legislators and members of the press have proposed placing increased restrictions on all semi-auto firearms, which would include some hunting rifles. Whether these proposals are merely the result of ignorance of the wide variety of firearms that are semi-automatic, or misguided efforts in the face of definitional problems, they only lend credence to the gun lobby's argument that restrictions on assault weapons are merely the first step toward banning all semi-automatic guns.

Assault firearms are semi-automatic (firing one bullet per trigger pull) and fully automatic (the weapon will keep on firing as long as the trigger is depressed) anti-personnel rifles, shotguns, and handguns that are designed primarily for military and law enforcement use. With muzzle velocities that are often greater than standard long guns, and high-capacity ammunition magazines, assault weapons are built to kill large numbers of human beings quickly and efficiently. In tests at their firing range, San Jose, California police found that a fully automatic UZI could fire its 30-round magazine in slightly less than two seconds. A semi-automatic version of the weapon required only five seconds for the magazine to be emptied.[1] Most assault weapons have no legitimate hunting or sporting use. Assault rifles and shotguns often have pistol grips and folding stocks, and are typically lighter and more concealable than standard long guns. Some assault pistols have threaded barrels for the easy attachment of silencers. Many assault weapons are merely semi-automatic versions of military machine guns, making them easier to convert to fully automatic machine guns.

The number of assault weapons in civilian hands--both criminal and law abiding--is estimated to be in the hundreds of thousands, perhaps millions.[2] No exact figures are available. An unknown number of these weapons have been illegally converted to full-auto. (For an explanation of the different categories and types of firearms, please see Appendix I.)

ASSAULT WEAPONS VIOLENCE

- October 1984. San Jose, California police officer Joe Tamarett is shot and wounded with an UZI carbine.[3]

- January 1988. Virginia resident Michael Anthony Eberhardt is arrested in Washington, D.C., for allegedly purchasing 72 guns in Virginia during an 18-month period and then smuggling them into D.C. for sale to drug dealers. According to The Washington Post, "Many of the weapons were the semi-automatic TEC-9s favored by local drug dealers."[4]

- April 1986. Two FBI agents are killed with a Ruger Mini-14 in a shootout in Miami, Florida.[5]

- April 1984. Dennis Cresta, dressed in camouflage fatigues and carrying a Ruger Mini-14 and Colt AR-15, opens fire in Oakland, California, after being questioned by a policeman. No one is hit.[6]

- July 1987. An elderly woman and her three sons kill three police officers who come to their motel room in Inkster, Michigan, to serve a warrant for a $286.40 bad check. One of the weapons used to slay the officers is a Heckler & Koch assault rifle.[7]

- September 1988. Samuel Eloud holds 11 people hostage in a Richmond, Virginia shopping center with a semi-automatic AK-47 and handgun in order to bring "peace to Lebanon."[8]

- June 1984. Denver, Colorado radio show personality Alan Berg is gunned down with a silenced MAC-10 by right-wing extremists.[9]

- July 1984. James Huberty goes "hunting for humans" with an UZI, a handgun, and a shotgun in a San Ysidro, California McDonald's. Twenty-one die; 19 are injured.[10]

- December 1985. Portland, Connecticut eighth-grader Floyd Warmsley kills school janitor David Bengston with his father's TEC-9, then holds a classroom of children hostage.[11]

- July 1988. Manassas, Virginia, police officer John Conner is gunned down with a Colt AR-15 by a man whose wife had recently left him.[12]

- April 1987. William B. Cruse opens fire with a Ruger Mini-14 outside a Palm Bay, Florida shopping center, killing six and injuring 10.[13]

- March 1988. An arsenal that includes a Chinese-made semi-automatic AK-47, a hand grenade, 14 other semi-automatic guns, 32-round ammunition magazines, and a handgun outfitted with a laser sight is seized from five men in New York City's Port Authority bus terminal.[14]

- February 1988. At a press conference decrying the increase in assault weaponry, Prince Georges County (Maryland) Police Chief Michael J. Flaherty states, "The real issue is the safety of our officers." Holding up a TEC-9, he adds,"It's not used for hunting, and it's not used for sporting events. In my opinion, they should not be sold in the United States."[15]

These events are not isolated incidents. Although no comprehensive, nationwide statistics are available on the misuse of assault weapons specifically, police organizations, police departments, government agencies, and handgun restriction organizations agree that the sale and misuse of assault weapons has escalated dramatically during the 1980s. (Most law enforcement reporting systems are set up only to separate handguns from long guns. The federal Bureau of Alcohol, Tobacco and Firearms (ATF), the government agency charged with enforcing federal firearms laws, will soon begin breaking out assault weapons from standard long guns.[16])

"There has been an increase in [assault] weapons by all walks of life--gang members, drug dealers, your next door neighbor, even police officers," states Detective Bohannon of the

Los Angeles Police Department Gun Detail. In Los Angeles, assault weapons have turned up increasingly in gang violence and drive-by shootings. Says Bohannon, "These are not sporting weapons. They're designed for one purpose and one purpose only, and that's to kill people." (Bohannon stresses that his opinions are personal and do not reflect the view of the Los Angeles Police Department.) According to Bohannon, essentially the same models of weapons are being seen on the streets by police: "Your least expensive weapons are your MACs and TECs. In the middle you've got your AK-47s and your UZI. At the top level are going to be your AR-15s....[and others]."[17]

During fiscal year 1987, almost a third of the firearms seized by agents of the Drug Enforcement Agency (DEA)--the leading federal agency charged with enforcing America's federal drug laws--from drug traffickers were semi-automatic and fully automatic. (These figures include non-assault semi-automatic pistols. Figures on solely assault rifles and pistols are not available.) Sixteen percent were fully automatic. On a daily basis, DEA agents seized automatic weapons that included M-16s, AK-47s, MAC-10s, MAC-11s, and UZIs.[18]

From January 1 to February 10, 1988, of the 388 guns seized by District of Columbia police, the vast majority were either semi-automatic or fully-automatic. Only seven such weapons were seized during the first six months of 1987, six in 1986, one in 1985, and two in 1984.[19]

In neighboring Prince George's County, Maryland, from July 1987 through February 1988, police seized 140 semi-automatic or automatic weapons, including a TEC-9 and several UZI submachine guns, some equipped with silencers.[20]

In 1986, ATF seized 2,854 illegal machine guns. These weapons were either converted illegally or illegally possessed. In 1985, the number of illegal weapons seized was 2,042. In 1984, 539.[21]

The most popular assault weapons are the AK-47, AR-15A2, MAC-10, MAC-11, Ruger Mini-14, TEC-9 and UZI. (For a description and brief history of each weapon, as well as select advertising information, please see Appendix II.) Recognizing the strong market for high-capacity, concealable assault weapons that are painted black and look threatening, America's firearms industry continues to introduce new models. Two of the latest are:

- The Calico M100P pistol, manufactured by American Industries in Bakersfield, California. With its futuristic lines and black finish, this .22 caliber weapon is the Darth Vader of handguns. Composed of a lightweight alloy frame, it has a "helical feed" 100-round capacity plastic magazine. A 50-round magazine is also available. The weapon also comes in

a carbine (a short-barreled, lightweight rifle) version with a folding stock. Under the headline "Durable, Accurate, Light, Versatile," an ad for the gun shows an intimidating M100P pistol with an optional "Klear-Vue" magazine (a see-through magazine that gives the shooter "complete visibility of rounds remaining in the magazine") and laser sight.[22]

The pistol version of the weapon is 17 inches long with the 100-round magazine, and weighs 3.75 pounds. The carbine version, with its stock retracted and the 100-round magazine, is 29.8 inches long. In November 1988, Calico will introduce a 9mm version of the weapon.[23]

- The Street Sweeper is a 12-gauge riot shotgun with a revolving cylinder that rotates with each trigger pull. Able to fire 12 rounds in less than three seconds, the weapon is manufactured by SWD, Inc. (manufacturers of the MAC-11). An ad for the weapon reads, "It's a Jungle Out There! There Is A Disease And We've Got the Cure." It invites the reader to "Make you [sic] streets safe and clean with the help of 'The Street Sweeper'!" With its folding stock retracted, the weapon has an overall length of 25 5/8 inches.[24] The SWD weapon is modeled on a shotgun used by South African security personnel, the Striker 12. Efforts had been made to import the Striker, but the weapon was the first long gun ever to fail the sporting-use test that ATF applies to imported long guns. (Domestically produced firearms do not have to meet any sporting use standard.)

DRUG TRAFFICKERS, PARAMILITARY GROUPS...

Because of their ease of purchase, effectiveness, convertibility, and mystique, assault weapons have become increasingly popular among people involved in the drug trade. Or as one DEA spokesman put it, "There's a machismo to carrying the biggest, ugliest, and most powerful weapon available."[25]

According to DEA Special Agent Maurice Hill, drug dealers in Miami began to switch over from revolvers to higher capacity pistols in the early 1970s. By the end of the decade, they had begun using shoulder-carried weapons, and by the early 1980s had upgraded to weapons like the UZI. Since then, criminals nationwide have expanded into a broad category of assault weapons. Regarding assault weapons, Special Agent Maurice Hill says, "They're all over now."[26]

Noting that drug traffickers "seem to like the AR-15s, AK-47s, TEC-9s," ATF spokesperson Tom Hill concurs: "We've seen a proliferation because of the drug trade. More and more people

want to have increased firepower and the status of having the semi-automatic assault type weapon. It looks dangerous. Most assault weapons used in criminal acts were initially purchased legally. Some are stolen, some come from over the counter through straw purchases, some are from people who fill out the forms illegally."[27]

In 1987, ATF traced weapons seized from two members of a Jamaican drug gang (known as "posses") in Tampa, Florida. The trace found that 149 weapons had been purchased over the counter from Tampa-area dealers. The majority of the weapons were TEC-9s, MACs, AR-15s, and Glock 17 handguns, "all preferred weapons of the Jamaican posses."[28] (The Glock 17, the first handgun to incorporate plastic into its structural design, is not considered an assault weapon.) As the result of this increased criminal firepower, police departments are beginning to abandon their six-shot revolvers for higher-capacity semi-automatic handguns.

Assault weapons have also become the weapon of choice for a different category of criminal: America's right-wing paramilitary extremists. In his book, Armed and Dangerous: The Rise of the Survivalist Right, author James Coates describes the scene outside the 224-acre compound of the paramilitary extremist organization, The Covenant, Sword and Arm of the Lord (CSA), located in Three Brothers, Arkansas, prior to a raid by law enforcement officials in 1985:[29]

"[A]ll visitors were greeted by a group of roughly half a dozen obviously frightened and surly young men carrying Mini-14s, MAC-10s and other automatic and semi-automatic weapons. Other armed CSA soldiers were clearly visible in a fifty-foot-tall guard tower overlooking the front gate, from which they pointed machine guns at reporters. Noble [a CSA member], wearing a Bowie knife strapped to one leg and cradling a converted AR-15 automatic rifle in his arm, repeatedly came to the gate to spar verbally with the nervous news media."[30]

Until recently, police had believed that the CSA--after its members were subjected to increased government prosecution, its compound deserted, and its leader, James Ellison, imprisoned for crimes that included the manufacture of automatic weapons--had disbanded. But in May of 1988, CSA member Londell Williams was charged with conspiring to assassinate presidential candidate Jesse Jackson. Police recovered a converted AR-15 from Williams.[31]

Other paramilitary organizations that favor assault weapons and have been known to convert them to fully automatic machine guns include the Posse Comitatus, Aryan Nations, and The Order.

Although many drug traffickers and members of paramilitary organizations are convicted felons, they are often able to

illegally buy these weapons from retail sales outlets. In every state, assault rifles and shotguns are sold under the same lax restrictions that apply to hunting rifles and shotguns. Assault pistols are sold under the same laws that apply to handguns, which vary from locality to locality.

Some states do require that the purchaser of any firearm first receive an owner's ID card or permit, while other states have a waiting period for all firearms. Yet most states' standards for the sale of long guns are no more severe than the federal law, which requires only that the purchaser be 18 years old and fill out a federal form 4473. On this form, the purchaser swears that he is not a convicted felon, drug addict or alcoholic, and that he does not have a history of mental illness. Most purchases are cash and carry, and long guns can be purchased interstate, with no limit on the number of weapons that can be purchased.[32]

The federal standards for handguns are essentially identical to that of long guns, except that they cannot be sold interstate, the purchaser must be 21 years old, and multiple purchases (more than one handgun purchased within five working days) must be reported to ATF.[33]

(In 1986, Congress outlawed the future production of machine guns for civilian use. Currently, there is a pool of more than 187,000 machine guns that citizens can legally purchase.[34] To obtain a machine gun, a citizen must be fingerprinted, photographed, submit to a background check, wait five to six months, and a $200 transfer tax must be paid. These same standards must be met to possess silencers, sawed-off rifles and shotguns, and military weaponry, such as hand grenades, land mines, grenade launchers, and other weapons and accessories restricted under the National Firearms Act of 1934.[35])

The most restrictive handgun laws are on the state and local level, and assault pistols would be sold under these standards. Handgun laws in America range from Morton Grove, Illinois, which has banned the sale and private possession of handguns, to the state of Florida, which operates essentially under only the federal standards.[36]

Because many assault weapons--such as the AR-15A2, M100P carbine, Ruger Mini-14, Street Sweeper, and UZI carbine--can be purchased as standard long guns by virtually anyone who is willing to lie on the form, they are a boon to criminals. Assault pistols can be purchased easily by criminals in states with lax handgun laws such as Texas, Virginia, and Florida. From there, these weapons can then be sold to criminals in cities and states with more restrictive laws.

AND JUST PLAIN FOLK

Although much attention has been focused on drug traffickers and paramilitary extremists, many assault weapons are purchased by "just plain folk." These people run the gamut from survivalists who want to be ready "just in case" to gun owners who want the thrill of owning the latest high-tech weapons.

A 1986 Defense Monitor on "Militarism in America," published by the Center for Defense Information (CDI), in Washington, D.C., notes an increasing "fascination for paramilitary weapons and training" among the general public.[37]

Television shows such as "The A-Team," first broadcast on ABC in 1983, "Miami Vice," first broadcast on NBC in 1984, and other action/adventure/police dramas have acted as a showcase for new weaponry. In effect, these shows supply free advertising for assault weapons manufacturers.

The Center for Media and Public Affairs, based in Washington, D.C., monitored 620 television programs throughout the past 30 years, revealing a noticeable shift toward military-style assault weapons.[38]

According to Daniel Amundson, research director for The Center, "There certainly is a greater number of automatic weaponry," and this is "partly reflecting news from the front pages and partly reflecting artistic embellishment." Noting that guns have been "ever present" in television, Amundson adds, "The presence hasn't changed, but which ones are present has. 'Miami Vice' requires very sleek and modern weapons. This shows a reflection of the headlines. If drug lords are using more UZIs and MAC-10s, you're going to see it in 'Miami Vice' six to nine months later."

According to Amundson, television has a "tremendous potential to act as a marketplace for anything: weapons, violence, soap, attitudes toward blacks and women. Television has helped the average person to identify weapons more than we'd ever thought, expanded our knowledge, terminology, of the types of guns available. UZI, MAC-10 is no longer jargon for firearms specialists; and that tells us a great deal."[39]

Meanwhile, in movie theaters, the .44 magnum handgun of Clint Eastwood pales in comparison to the weapons of Rambo and his ilk. Throughout the 1980s, Sylvester Stallone films such as the Rambo series and "Cobra," Chuck Norris movies such as the "Missing in Action" series and "Invasion USA," and Arnold Schwarzenegger movies such as "Terminator," "Predator," and "Commando" have helped popularize paramilitary weapons and accessories.

ASSAULT WEAPONS MARKETING

The marketing of assault weapons throughout this decade is in large part due to the slump in handgun sales that has afflicted the industry since 1982. Handgun production dropped from a high of 2.7 million that year to less than 1.7 million in 1984--a decrease of nearly 40 percent. In 1986, production increased to 1.9 million, a level still well below that of the early 1980s.[40] (Because handgun manufacturers will not release sales figures, and are not required to do so by law, production figures are the only available gauge of the market.) With an estimated 35 to 40 million handguns in American hands,[41] the slump is apparently the result of saturation of the primary market--white males--and the increasing resale of used handguns.

In their marketing of assault weapons, manufacturers often focus on their police or military functions, their ruggedness and dependability, and the cache of a lone man and his gun against the elements, crime, or the unstated threat of post-nuclear survival.

Colt Industries has even developed an ad aimed directly at survivalists. The 1985 ad features a handsome rancher looking across his land. He has leather patches on the elbows of his flannel shirt and an AR-15A2 in one hand. The headline reads: "Survival means different things to different people. For a rancher in the high country of Wyoming, being self-sufficient can mean keeping varmints from his sheep. For a rugged individual in the wilderness, it means being prepared for any eventuality. For both these men, and thousands like them, there's only one gun. The Colt AR-15A2. The reasons are as simple as they are plentiful. First, it's the rifle they're already familiar with. The AR-15A2 Sporter II is the civilian version of the battle proven and recently improved U.S. military M-16A1..."[42]

This survivalist sales pitch is echoed in an ad for Heckler & Koch's HK 91 semi-automatic assault rifle. The ad's headline reads, "When you're determined to survive, you leave nothing to chance. In a survival situation, you want the most uncompromising weapons that money can buy. The HK 91 Semi-Automatic Assault Rifle from Heckler & Koch." The ad ends with the tag line, "In a world of compromise, some men don't."[43]

An ad for the FIE/Franchi LAW-12 shotgun--which comes in standard hunting and assault configurations--urges the reader to "Take the 'LAW' Into Your Own Hands. Whether you patrol the birdlands when the sun is rising...or patrol the boonies when the sun sets...the FIE/Franchi LAW-12 is the LAW of the land! All the LAW you need! Situation - The sun has set, it's now midnight, you're called to a Code 3 situation! Your backup is deployed to another sector. You're all alone, left to handle a tough situation...What do you do? Take the LAW-12 into your hands - A possible 9 rounds of heavy hitting 12 guage [sic] "00"

Buck - All 9 rounds can be emptied on target in less than 3 seconds...operation successful..."[44]

ASSAULT WEAPON LOOK-ALIKES: AIRGUNS AND TOY GUNS

Paramilitary enthusiasm has not been limited to the firearms market. America's manufacturers of non-powder firearms (such as BB guns and pellet guns) and toy guns have been quick to realize that assault weaponry is in. These manufacturers' role models are no longer hunting rifles and Western-style six-shooters, but machine guns and large-caliber handguns. This shift has been accompanied by a keener eye to detail and advances in plastic molding. The result: non-powder firearms and toy guns that are virtually indistinguishable from their more lethal counterparts.

Daisy Manufacturing was one of the first to recognize this potential market. The company introduced its paramilitary line of imported Softair guns in 1986. Softair guns are working replicas, down to the point of expelling spent shells and firing plastic pellets. They retail for approximately $60. "So accurate in detail you'll swear it's the real thing!...a 'must have' for paramilitary enthusiasts of all ages," reads the catalog description for a replica of the UZI Assault pistol. Copy for a replica of the KG9-SP (predecessor of the TEC-9) boasts that it's "an authentic reproduction of the American-made semiautomatic defense weapon used by anticommunist guerrillas in Angola." A replica of a Heckler & Koch weapon is described as being "without a doubt the most exciting paramilitary airgun on the market today! Styled after the semiautomatic firearm carried by the German police and made famous in the motion picture, 'Rambo: First Blood, Part II,' the Model 15 has the look and feel of the real thing."[45]

Rival manufacturer Crosman has its own UZI look-alike (which fires metal projectiles) and a reproduction of Colt's M-16 machine gun dubbed the A.I.R. 17. Crosman guarantees that "it looks just like the real thing," down to a detachable pellet clip and flash guard on the muzzle of the gun.[46]

Larc International, located in Longwood, Florida, offers--by mail--the M19-A BB submachine gun. "Imagine--a 3,000 BB per minute cycle rate with an effective range of over 50 yards--That's some AWESOME Fire Power!!!" With a magazine capacity of 3,000 BBs, the weapon also comes in a pistol version. Each sells for $39. On the ordering coupon, the purchaser must promise that he or she is 18 years or older.[47]

The Para-Ordnance M-85 is a full-auto paint ball "splat gun" MAC-11 machine pistol replica that fires 1,200 rounds per minute at 440 feet per second. The 24-round magazine can be emptied in 1.2 seconds. It sells for $299.50.[48]

Far more common than paramilitary non-powder firearms are plastic-molded toy assault weapons. In addition to such staples as M-16s, AK-47s, UZIs, and KG-9s, Daisy, the self-proclaimed leader in the field, offers toy silenced MAC-10 pistols (the Alan Berg murder weapon) and bolt action machine guns.[49]

The International Association of Chiefs of Police (IACP), located in Gaithersburg, Maryland views look-alikes as a unique threat to public safety. As criminal misuse of assault weapons increases, police are more likely to assume that look-alikes are in fact real firearms. People who thoughtlessly display or brandish look-alikes run the risk of finding themselves in a deadly face-off with a police officer who must make a split-second decision on whether to draw a weapon and fire. According to the IACP, incidents involving airguns, highly detailed toy guns, and paint "splat guns" are increasing dramatically.[50]

In May 1988, as an amendment to a bill dealing with the threat posed by non-detectable "plastic" firearms, Congress voted to require that every look-alike sold in America be clearly marked with an orange stripe or other color to distinguish it from its real counterpart. The bill is awaiting presidential signature, which is expected. On the state and local level, laws have been introduced and enacted regarding the sale, production, and brandishing of look-alikes.

But even prior to the bill, various companies, reacting to the growing debate over look-alikes and the increasing negative publicity their sales generated, began to shift their product lines and mark their products to help distinguish them from real firearms. In late 1987, Daisy stopped the sale of its SoftAir guns, which had been imported from Japan. A spokesman for the company noted, however, that the decision was "90 percent financial. The guns just weren't selling."[51]

Critics of the marking concept point out that the markings can be easily painted over and will do little good in the dark, while criminals can paint similar markings on real guns.

What makes look-alikes so appealing--that they look <u>just like</u> the increasingly popular assault weapons--is precisely what makes them so dangerous.

<u>PUBLICATIONS</u>

The growing fascination with assault weapons has been accompanied by a growth in the number of publications dedicated to the non-sporting use of firearms.

<u>Firepower</u>, published by Everett Moore out of Cornville, Arizona, is the only magazine in America dedicated to full-auto and high-capacity firearms and has a circulation of 90-95,000.

(Prior to the 1986 machine gun ban, the magazine had been devoted exclusively to full-auto.) Each issue of the magazine is filled with weapon, ammunition, and accessory reviews. Virtually all of the weapons reviewed are assault weapons.

According to Moore, "We jokingly refer to them as black and wicked-looking types of guns. They fill a need in the consumer market for people...who cannot afford the automatic version of the same weapon." Moore acknowledges that violence involving these weapons is "a legitimate concern. It's reality and you can't deny that." He adds, though, that, "it seems like any time we go to disarm the criminal, we end up disarming the legitimate, honest civilian."[52]

American Survival Guide is "the magazine for safer living." Published by McMullen Publishing in Anaheim, California, articles are listed under headings that include "Survival Weapons," "Survival Gear," and "Survival How To."[53] It also contains the "Survivalist Directory," a post-apocalypse personals column that offers a "confidential listing of survivalists who wish to become known to others of like mind." Personal ads in the August issue include:

- "Melbourne, Florida. Teenage military organization that does U.F.O. research would like to recruit members. Also would like to set-up [sic] information exchange and meet others in this area for training. All races and sexes are welcome. Ages 12 and over only. No racists or religious fanatics need apply."

- "Northern Arkansas. Young, conservative male seeks correspondence with other survivalists in area. Special interest is nuclear survival. No liberals, atheists, druggies or alcoholics. Females welcome. All ages reply."

- "Baltimore, Maryland. Urban group which meets biweekly is looking for interested local survivalists wishing to exchange information. We are not Rambos, racists, or extremists, but family-oriented and interested in workable, realistic solutions to short and long term survival scenarios."[54]

Published since 1979, Survival Guide has a circulation of between 30,000 and 70,000.[55]

In addition to his mainstay, the monthly Combat Handguns, New York-based Stanley Harris also publishes such annuals as Guns & Survival and Special Weapons. Another Harris publication, Eagle, which had promised its readers "violent combat action," has ceased publication. An October 1983 issue of the magazine featured an article entitled, "The Amazing Soft Drink Silencer -- I'm a Pepper, You're a Dead Man." The article outlined the ease

with which a two-liter plastic soft-drink container could be used as a silencer for a MAC-10. Eagle found it to be "the best suppressor found in today's supermarkets. It's cheap, effective, and mixes well at parties. What more could you want?"[56]

The Special Weapons annual offers "The Newest Ideas in Guns and Equipment as Well as Combat-Proven Tactics."[57] Articles in Special Weapons include: "Colt Delta HBAR--Boasting sniper rifle accuracy we compare this new Colt to the combat-proven Galil"; "The Search for Compact Firepower--We compare submachine guns to short assault rifles"; "The Offensive Handgun--It's the tool of the assassin"; "How to Buy Automatic Weapons--Latest prices and availability of Class III firearms"; and the "Assault Rifle Buyer's Guide."[58]

"The Offensive Handgun" is a how-to piece on assassination. The article advises that "single shots are preferred. The head, neck, and spine are the best targets."[59] Recognizing that sometimes "an unsuppressed pistol may be the only one available," the article advises that, "the sound can be muffled by shooting through...a potato or pillow. If the muzzle is held against the target this also may muffle the sound, but it can also cause him to react in unexpected ways, besides presenting the possibility of the pistol jamming from bits of clothing or flesh caught in the muzzle or chambers."[60] The article notes that the speed and capacity of a modern machine pistol are "important when shooting a number of people at once."[61]

Soldier of Fortune, published out of Boulder, Colorado, describes itself as "The Journal of Professional Adventurers." In a disclaimer on its title page (a trait many of these magazines share), it warns readers that the magazine "does not verify validity of every advertisement and/or the legality of every product contained herein. Soldier of Fortune magazine does not intend for any product or service to be used in any illegal manner."[62] The magazine has been published since 1975 by National Rifle Association board member Robert K. Brown.

In addition to various "you are there" articles such as "Sandinista Staredown" and "Bum Trip in Bolivia,"[63] the magazine contains weapon reviews and combat tactics. Soldier of Fortune had also carried classified ads for mercenaries for hire. This practice has since been discontinued as the result of a lawsuit filed by the family of a victim whose murderer was hired as the result of an ad placed in the September 1984 issue of the magazine. The ad read: "Ex-marines. 67-69 Nam Vets. Ex-DI, weapons specialist--jungle warfare. Pilot. ME. High risk assignments. US or overseas."

In 1984 Robert Black hired John Wayne Hearn to kill his wife. Hearn did so in February 1985. It had been Hearn's third murder in 19 days. As the result of this, the victim's parents and son sued Soldier of Fortune for $21 million, arguing that the

magazine was aware of the implication contained in the ad.[64] In March 1988, a Colorado jury found that the magazine should have known that the ad was offering the services of a hired killer and ordered it to pay $9.4 million. The decision is currently being appealed.[65] (Soldier of Fortune refused to answer any questions for this report, including circulation and initial date of publication, on advice of their legal counsel pending outcome of the suit.)

New Breed, "the magazine for military adventure,"[66] is published by Harry S. Belil, out of Nanuet, New York. Though the magazine focuses more on military action, it does contain articles on assault weaponry and tactics. The August 1988 issue also contains a review of the 1988 SHOT (Shooting, Hunting, Outdoor Trade) show, the annual trade show of the firearms industry, held last January. In the piece, the author notes that "there were plenty of assault rifles at the show."[67]

Shotgun News describes itself as "The Trading Post for anything that shoots." Published three times a month out of Hastings, Nebraska, the 200-page, tabloid-style magazine has a circulation of nearly 190,000.[68] The magazine is crammed with classified and display ads for firearms and accessories, most of which are geared to firearms dealers.

In addition to a cavalcade of gun ads, Shotgun News carries ads for a variety of accessories (including Nazi memorabilia such as coffee mugs with swastikas[69]), firearms, and publications, including The Turner Diaries, the "bible of right-wing extremists." In the book, "Earl Turner and his fellow patriots...are forced underground when the U.S. government bans the private possession of firearms and stages the mass Gun Raids to round up suspected gun owners. An all-out race war occurs as the struggle escalates. Turner and his comrades suffer terribly, but their ingenuity and boldness in devising and executing new methods of guerrilla warfare lead to a victory of cataclysmic intensity and worldwide scope. If the government had the power to ban books, The Turner Diaries would be at the top of their list. Order your copy today." The $5.95 book is offered by the neo-Nazi National Vanguard located in Arlington, Virginia.[70]

ACCESSORIES

Not only do these publications supply information, but they also contain advertisements for various catalogs and products. The Survival Systems book catalog describes itself as offering "the most unusual and controversial books you've ever seen in your life."[71] In a disclaimer, the company notes, "Certain of the books in this catalog deal with activities and items which could be in violation of various laws if actually performed or constructed. We do not advocate the breaking of any law. Our books are sold for entertainment purposes only and only to adults!"[72]

With a toll-free number for credit-card orders, the catalog contains books on revenge, fraud, dirty tricks, firearms conversion, home construction of firearms and explosives, and murder techniques.

Books offered by Survival Systems include:

- How to Build Silencers: An Illustrated Manual. "A complete manual for the construction of silencers at home with simple tools. Build in less than one hour. $5.95."[73]

- Improvised Weapons of the American Underground. "This book makes other 'cookbooks' things for Sunday School picnics. This collection of original articles covers: Making of Nitroglycerin; Plastic Explosives; Detonators and Primers; Fuses; Impact Ignition Incendiary Devices; and Construction of Various Types of Silencers; and Complete Plans for a Home Made Machine Gun which can be built for less than $20.00. An absolutely incredible manual. $7.50."[74]

- Full Auto. "A completely illustrated modification manual on selective fire conversions for the following weapons: Mini-14; AR-15; HK-91-93; MAC 10-11; and the M1 Carbine. With this new edition, you can convert all five weapons into their full-automatic configurations with ease, as all procedures are thoroughly explained in an easily understood, fully illustrated, step-by-step manner. Without a doubt, this is the finest conversion manual on the market. $12.00."[75]

Robert K. Brown's Paladin Press offers a 47-page, glossy catalog that includes sections on sniping, revenge and humor, survival, weapons, explosives and demolitions, guerrilla warfare, silencers, new ID and personal freedom, locksmithing, and terrorism. In an essay entitled "New Age Survival," readers are reassured that "We don't want to alarm you into heading for the hills today--but will help you become prepared to do so tomorrow."[76]

Books offered in the catalog include:

- Anarchist Handbook. "For the modern anarchist, all you need to know to construct an impressive selection of improvised weapons," including "an expedient silencer; a pipe hand grenade; plastic explosive; and a rocket launcher. For each weapon, the author supplies a list of materials easily acquired from drug or hardware stores, hobby shops, supermarkets or even junk piles; step-by-step procedures; simple diagrams and how-to-use instruction for certain weapons. $7.00."[77]

- The Mini-14 Exotic Weapons System. "Convert your Mini into a full-auto, silenced, SWAT-type weapon that is capable of field clearing firepower. Note that this conversion process requires no machining or special tools. Once completed it takes just five minutes to drop in the Automatic Connector (the book's secret!) or remove it as needed. It's that simple! $15.00"[78]

- Improvised Explosives--How to Make Your Own. "Ten simple but powerful formulas for explosives and incendiaries" that gives the reader the ability "to construct actual bombs, booby traps and mines. Learn how to obtain or make all the necessary chemicals or get acceptable substitutes. Various fuses, detonators, and chemical and electrical timers are covered, as are pipe bombs, plastic bottle bombs, jerry can bombs and tamperproof bombs. With ease, you can construct such devices as a package bomb, booby-trapped door, auto trap, sound-detonated bomb, or pressure mine--to name just a few. $10.00"[79]

- How to Kill (volumes one through six). "[M]akes no moral judgments, but merely describes what has been known for years by the professionals who are part of the shadowy world of international espionage and intrigue. As the author states in his preface, 'My only premise is that there are times when one must attack with complete ruthlessness and fight with lethal fury. This fury and ruthlessness must be harnessed and directed to the gravest possible damage--to kill.'" Priced at $8 per volume, the catalog notes that no book in the How to Kill series is available in Canada due to legislation by the Canadian solicitor general.[80]

In addition to operating a 24-hour-a-day, toll-free order line and offering a "no questions asked" money-back guarantee, Paladin Press also offers gift certificates, which "make excellent gifts for you to send to friends and relatives."[81]

Firepower's Everett Moore also runs a mail-order publications house. Moore's Desert Publications offers many of the same publications as his competitors under headings that include: weapons and firearms, specialized warfare, police science, survival, self-defense, full-auto, suppressors, and improvised munitions.[82] Moore, who sells between 2,000 and 5,000 copies of specific titles a year, refers to the publications as "big boy toys," adding, "I haven't known a man yet who didn't like [to know how] to pick a lock."[83]

The catalog of Phoenix Systems, Inc., located in Evergreen, Colorado, offers its buyers "The Right Stuff," which includes:

- U.S. Military Practice Grenades "with ALL the mechanical parts IN THE FUSE ASSEMBLY!!! -- NO EXPLOSIVES." The ad warns that "ACTIVATION OF THESE DEVICES REQUIRES PRIOR BATF APPROVAL. $19.95 each."[84]

- Booby Trap Firing Device (M-1), "Standard U.S. Military PRESSURE RELEASE firing device used to initiate detonation of explosive charges in BOOBY TRAP applications or remote firing of Claymore mines. EXCELLENT training device because it is RELOADABLE with new primer caps (when not coupled DIRECTLY TO AN EXPLOSIVE CHARGE). Hundreds of applications -- can be screwed directly into an explosive charge for instantaneous detonation or coupled to detonator cord for remote firing. $14.95 each."[85]

- The Ballistic Knife--The Knife That Shoots. "CONGRESS OUTLAWED THE SPRINGS--BUT YOU CAN STILL BUY THE KNIFE!" The knife "can be fired up to an effective range of 30 feet. The typical penetration of this knife is about three times that of a manual stab. Extra blades and flight stabilizer available. $79.95 each." Under the heading "ATTENTION COLLECTORS AND SPORTSMEN," the ad notes, "Due to recent Federal regulation, the Ballistic Knife may no longer be sold with the projection spring. The Ballistic Knife, IN LEGAL KIT FORM, that we are now able to sell, is identical to the original knife without the spring included." The ad adds, "WE SELL NO SPRINGS."[86]

- "FULL AUTOMATIC FIRE FOR YOUR AR-15. The drop-in auto sear is the KEY component in converting an AR-15 to M-16 selective fire capability (semi or full automatic) and is the ONLY part for this conversion that is now required to be registered if CURRENTLY manufactured. OUR auto sears were manufactured prior to 11/1/81 when it was NOT required to have a serial number stamped on this part. COMPLETELY LEGAL TO PURCHASE." With the purchase of "five other commonly available M-16 replacement parts," the conversion can be made "in SECONDS without tools." The ad urges readers to "Act now while it is still legal to purchase these auto sears. When existing supplies are exhausted, THERE WILL BE NO MORE!! $175.00 each."[87]

The recommended reading list of the catalog includes books on silencers; on UZI, MAC-10, and AR-15 conversions; and on home munitions. Other products available through ads placed in these magazines include:

- The BMF Activator, a hand crank that can be attached to a rifle, boasts the "newest crank-operated rapid fire capability since the gatling gun!! Legally fire up to 1200 rounds per minute on your semi-automatic .22 rifle. Imagine the sensation of firing a truly rapid fire rifle. Since each turn of the crank handle fires the rifle four times, it is capable of pulling the trigger many times faster than you can." The advertising flyer for the activator includes a copy of a letter from ATF stating that "a manually operated device of this type is not subject to any of the provisions of the Gun Control Act of 1968."[88]

- The Tri Burst Trigger Activator, distributed by Orpheus Industries, offers "legal firepower." It "allows a 3-round burst from your AR-15...mounts in seconds" and fits "all makes" of AR-15 rifles. It sells for a "special introductory price" of only $34.95.[89]

- "The Ultimate" trigger activator derides its competitors as "the rapid fire plastic gizmo and the sheet metal device." With models available for the AR-15, Mini-14 and 30, M-1 Carbine, and AK models, The Ultimate allows the user to "fire individual rounds, 3 shot bursts or 50 round bursts at your instant discretion." The ad notes that "all federal laws (if any) will apply. The ATF has ruled this device is not regulated by federal law." It retails for $129.95.[90]

- The API Predator Laser Target Designator is equipped with "helium neon lasers" that "project an intense, narrow beam of red light" with "an effective range" of up to 500 meters. Laser sights give their users point-and-shoot assassination capability. "Generally, the only visible element of the laser beam is a spot on a solid object that reflects light back to the operator. The beam itself is invisible in clear air." Priced at $495, the API laser sight is only one of many laser sights on the market, with some costing hundreds of dollars less.[91]

- An ad for Kephart Publications offers plans for such exotic weapons as: hand, rifle, and shotgun grenades; L.A.W., RPG-7, Bazooka, Pod, Pocket, Shotgun, and T.O.W. rockets; claymore and land mines; flame throwers; and others. The ad guarantees "these plans are legal to own and make according to

BATF provisions" and promises that the "basic information is complete and all WILL work. All devices are simple to make and very inexpensive. Only common material and hand tools required. NO MACHINE SHOP WORK." The ad offers any 10 plans for $55.00.[92]

- The "Deadly Weapons--Firearms & Firepower" video tape advertisement features an assassination kit of a silenced MAC-10 in a briefcase. The ad asks, "Do you know which bullets will penetrate a car door? A windshield? Just how quiet is a real silencer? How effective is full auto fire?" Purchasers of the tape can "SEE & Learn the Answers to these questions and much more!" The tape sells for $49.95.[93]

- The "Ninety Rounder" is a circular "assault magazine" that can hold 90 rounds of ammunition "for people who want real firepower!" Offered by the MWG Company it promises "LMG [light machine gun] Type Firepower From a Semi Auto Rifle." It retails for 49.95.[94]

- For the leisure hours, "Rock N' Roll #3--Sexy Girls and Sexy Guns, The Video" offers "14 outrageous, southern California beauties...firing some of the sexiest machine guns ever produced. And you're probably wondering about the girls. What can I tell you? They're hot. 14 different girls in string bikinis and high heels blasting UZIs, MAC-10s, M-16s, MP-5s, AK-47s, M-14s and more. It's something you just have to see."[95]

PARAMILITARY TRAINING CAMPS AND COMBAT SCHOOLS

Those interested in assault weapons and combat techniques do not need to rely solely on book knowledge. Around the United States, training centers--from the paramilitary training camps of right-wing extremists to commercial combat schools--offer training in the use of weapons, explosives, and combat skills.

According to testimony offered before the Subcommittee on Security and Terrorism in September 1985, paramilitary/mercenary training camps can be broken down into three categories:

- Franchises or commercial establishments that offer training to law enforcement or security firms worldwide;

- Paramilitary and survivalist organizations that offer training in the use of small arms, map reading, and survival under extreme circumstances (those operated by the Covanent, Sword and Arm of the Lord, for example). According to the Anti-Defamation League of

B'nai B'rith, many of these camps also include an indoctrination of race hatred.

- Mercenary training camps, the goal of which is to offer the knowledge and skills necessary to be a soldier-for-hire.[96]

In 1984, paramilitary training camps garnered media attention when the FBI revealed that several Sikh students had attended a two-week session at the Merc School in Dolomite, Alabama, with the intention of using their new-found knowledge to assassinate Indian Prime Minister Rajiv Ghandi.[97]

At the time, the Merc School's owner, Frank Camper, stated that he operated strictly within the law and was merely training people to survive in combat situations.[98] Said Camper, "If someone were to train with me and to go away and perform an act of terrorism, then I'm not responsible for that person's actions. They are responsible for themselves."[99] (Camper, however, apparently did inform on the Sikh students to the FBI, helping lead to their arrest.)

Critics of the camps argue that those run by survivalist and paramilitary organizations are turning out terrorists. The ADL states in the fall issue of its 1986 Law Report, "ADL Paramilitary Training Statute: A Response to Extremism," that in many camps, "'combat' training is interspersed with the indoctrination of hatred and totalitarianism in preparation for anticipated civil strife, the rationale being the vision of a 'coming race war.'"[100]

In 1980 such camps were uncovered in Alabama, California, Connecticut, Illinois, North Carolina, and Texas.[101] Daniel M. Hartnett, ATF Acting Deputy Associate Director, Law Enforcement, stated at the 1985 hearings that camps run by extremists have shown "a willingness to commit violent crimes to further their cause and support their movement."[102]

A 1985 raid conducted by law enforcement officials at a compound run by the Posse Comitatus outside of Rulo, Nebraska, yielded a cache of weapons that included assault rifles and 13 fully automatic pistols and rifles, including modified AR-15s.[103]

In 1986, the ADL formulated model state legislation that would ban paramilitary training "aimed at provoking civil disorder."[104] In drafting the model bill, the ADL specifically stated that the statute must not violate First Amendment freedoms of speech and association. Another objective was to draft the statute narrowly so that it would not prohibit legitimate lawful activities such as target shooting and other sporting events. This was important, the ADL stated, for "minimizing opposition to the bill by powerful special interest groups."[105] Laws based on the statute have passed in Arkansas, California, Colorado, Connecticut, Florida, Georgia, Idaho, Illinois, Michigan,

Missouri, Nebraska, New Jersey, North Carolina, Oregon, Pennsylvania, Rhode Island, Virginia, and West Virginia.[106]

In a statement opposing legislation restricting paramilitary training camps, America's leading pro-gun organization, the National Rifle Association (NRA), based in Washington, D.C., states that such "legislation is objectionable because it makes the mere possession of firearms a crime, therefore undermining the right to keep and bear arms" and that "the constitutionality of such legislation is questionable at best, and could not, in all probability, withstand a court challenge based on violation of First Amendment rights."[107]

The controversy has faded since the 1985 hearings, although camps and schools continue to operate. The FBI currently has no figures on the numbers of camps and schools operating in the United States. One such school, Brigade Security Forces, located in Mooreville, North Carolina, offers six-day courses in "commando tactics." It offers "absolutely the best firearms training available with numerous NATO and COMMUNIST firearms." One can also enroll in a special 30-day course "designed for the adventurer that demands it all in one course." Counter terrorist, sniper, and covert operations are some of the areas covered. Brigade also offers private instruction for "Individuals or Groups who desire Total Secrecy and Special Training. NO COMMUNISTS, GAYS, ATHIESTS [sic]!!!" are allowed, and one must be at least 16 years old to attend.[108]

THE ASSAULT WEAPONS DEBATE

Not surprisingly, the increasing number and subsequent misuse of assault weapons has resulted in a growing debate over their place in American society. The battle lines mirror those drawn over other such "gun control" issues as waiting periods for handgun purchases, bans on armor-piercing bullets, and restrictions on the sale of "plastic" firearms. On one side of the debate is America's gun lobby. The other side consists of handgun restriction advocates and various police organizations.

America's gun lobby--composed of pro-gun organizations, manufacturers, and various publications--staunchly opposes any restrictions on the sale or availability of assault weapons. The leading voice of dissent belongs to the NRA. With 2.7 million members and a budget of more than $71 million, the NRA is America's largest and most powerful pro-gun organization.[109] In 1987 the organization published a pamphlet entitled Semi-Auto Firearms--The Citizen's Choice. A year later the organization published Semi-Auto Rifles: Data and Comment, a collection of articles on semi-automatics that had appeared in the NRA's magazine, The American Rifleman.

In both the pamphlet and the book, the NRA presents the controversy over assault weapons as a broader attack on all semi-

automatic firearms, including hunting rifles with semi-automatic mechanisms. By framing the debate as one concerning all semi-autos, as opposed to a specific category of semi-auto, the NRA is able to present efforts to restrict assault weapons as a threat to hunters. The NRA recognizes the fact that it is far easier to mobilize its membership and non-NRA outdoorsmen with images of banning their trusted hunting rifles as opposed to UZIs or TEC-9s.

The cover of Semi-Auto Firearms--The Citizen's Choice features a duck hunter, duck call in mouth, silhouetted against a bright orange sunrise. In his hand he appears to hold a shotgun. On the first page of the pamphlet, the NRA offers its view of the debate: "The national media and organized 'gun control' groups have advanced from demanding prohibitions on certain handguns and ammunition, to calls for banning semi-automatic firearms. The pattern is obvious, and the strategy has long been clear--isolate certain types of firearms, label them as inherently 'evil' or 'crime prone,' and then try to segregate and drive a wedge between firearms owners...[110] Fully automatic and high-tech firearms often seen on television programs, and in popular yet violent movies, perpetuate the myth that 'semi-autos' are frequently used for criminal purposes...[111] Even to experts, admittedly, semi-automatic target or sporting rifles such as the AR15 and M1A look like the full-automatic military M16s and M14s. Why not? A civilian jeep looks like a military jeep, a civilian tent looks like a military tent and a civilian shooter at the national Matches at Camp Perry looks very much like his military counterpart."[112]

(The NRA's stand on assault weapons is not surprising considering the fact that it has labeled repeal of the 1986 federal ban on the future production of machine guns for civilian use a "high priority."[113] In outlining its position on machine guns, the organization states, "Sporting events involving automatic firearms are similar to those events such as silhouette shooting and other target-related endeavors and deserve the same respect and support."[114] The NRA promises that it "will take all necessary steps to educate the public on the sporting uses of automatic firearms"[115] and explains that "The Second Amendment is not limited by its language to the type of arms that the people have the right to own."[116] The organization supports "the right of any law abiding individuals to own any firearms, including automatic firearms."[117]) (Although the NRA was asked to answer questions regarding its stand on assault firearms, the appropriateness of Soldier of Fortune publisher Robert K. Brown being on its board of directors, paramilitary accessories, and paramilitary training camps, a spokesman, after reviewing the questions, stated that the NRA was "declining to provide information for this report.")

While the NRA struggles to turn the assault weapons debate into a semi-auto debate for public relations purposes, legislators and members of the press have been making it into one

inadvertently. Neither of America's national handgun restriction organizations has come out in favor of restricting or banning all semi-autos, and have only recently begun dealing with long guns (there is no national organization calling for restrictions on all guns). Yet in discussions of assault firearms, those urging restrictions on these weapons have used the terms assault, paramilitary, and semi-automatic weapon interchangeably. This misusage apparently stems from an unfamiliarity with weapons terminology and a lack of understanding of the wide range of weapons covered by the term semi-automatic. As the result of this lack of knowledge, and the difficulties in defining assault weapons in legal terms, laws have been proposed on the state level that would place waiting periods on all semi-auto weapons. In August 1988, The New York Times ran two editorials in favor of such a law on the federal level, as well as urging a ban on the sale of assault weapons.[118]

According to John Hosford, executive director of the Citizens Committee for the Right to Keep and Bear Arms (CCRKBA), a 500,000 member pro-gun organization located in Bellevue, Washington, the issue of paramilitary weapons will be addressed at the organization's board meeting in September 1988. Says Hosford, "It would be safe to say that we will take an aggressive position in support of these." Founded in 1971, the CCRKBA favors a repeal of the Gun Control Act of 1968 and has lobbied against gun control ordinances on the local, state, and federal level.[119]

The 100,000 plus-member Gun Owners of America (GOA), located in Springfield, Virginia, views the assault weapons debate as part of a long-range plan by handgun restriction advocates to disarm America. Says GOA Director of Government Affairs Craig Markva, "The goal was to target the machine guns first, then the semi-autos, and right along with the handguns. The whole premise [of handgun restriction organizations] has been based upon the fact that the Second Amendment is a hunting right." But Markva argues, "the whole idea of the Second Amendment is self-defense. The goal of the anti-gunner is to isolate different categories of firearms for control or banning, and them move on. The slippery slope is alive and well and continues rolling on."

America's handgun restriction movement has been cautious in its response to the assault weapons debate. Their reticence is understandable. By moving against a category of firearm that is not only a long gun, but difficult to define, they run the risk of appearing to prove the gun lobby right: that is, that handgun restrictions are merely the first step down the aforementioned slippery slope.

In the past, the "gun control" debate was easily defined. "Good" guns were long guns that were used for hunting and sporting purposes, while "bad" guns were easily concealable handguns that had limited sporting use and were prone to misuse.

Previously, the standard for restricting weapons involved concealability and a cost/benefit analysis: Is the harm done by a given category of firearm outweighed by any possible benefit? Yet, although assault weapons are frequently misused and many are more concealable than standard long guns, a new standard is emerging: For what purpose was this weapon designed? The first application of this standard came in 1986, when Congress voted to outlaw the future production of machine guns for civilian use. The number of criminal incidents involving legally owned machine guns prior to the ban had been few. Yet, Congress saw no reason for this category of weapon to remain in civilian hands.

Handgun Control Inc. (HCI), based in Washington, D.C., is America's leading handgun restriction organization. The organization has more than 180,000 dues-paying members and an annual budget of more than $4 million. Its vice-chair is Sarah Brady, wife of White House press secretary James Brady, who was injured in the March 1981 assassination attempt on President Reagan. In its organization brochure, HCI calls for the "restriction on the sale of UZI-type assault weapons, the weapons of war like that used in the 1983 McDonald's massacre in California." The organization adopted this stand in 1983. Recently, HCI has run newspaper ads calling for unspecified restrictions on assault weapons, labeling them "drug guns." In addition, HCI came out in favor of banning the Striker-12 from import. In addition to its stand on "UZI-type assault weapons," the organization favors a waiting period with background check for all handgun purchases, a ban on the sale of snub-nosed handguns, and a ban on the production and sale of plastic handguns.[120]

The National Coalition to Ban Handguns (NCBH), based in Washington, D.C., is a coalition of 31 national religious, professional, educational, and public health organizations that favors banning the sale and private possession of handguns in America. Exceptions to this would include possession by police, military personnel on active duty, target shooters who keep and use their handguns at bona fide shooting clubs, and federally licensed collectors. NCBH has approximately 20,000 members and an annual budget of $400,000. Prior to 1985, the organization dealt only with handguns. But in May of that year, its board voted to work to ban the sale and private possession of machine guns. Currently, its board is considering whether to endorse banning the sale and private possession of assault weapons. It is scheduled to reach a decision at its November 1988 meeting.[121]

The Law Enforcement Steering Committee is the leading voice of law enforcement on the gun control issue. The Committee consists of: the Federal Law Enforcement Officers Association; the International Association of Chiefs of Police; the Fraternal Order of Police; the International Brotherhood of Police Officers; the National Association of Police Organizations; the Police Executive Research Forum; the Police Management

Association; the Police Foundation; the Major Cities Chief Administrators; the National Organization of Black Law Enforcement Executives; and the National Troopers Coalition.[122] As of September 1988, none of the members of the Committee have adopted an official stand on assault weapons, although the topic is scheduled to be discussed in the future.[123]

On the federal level, no bills dealing with assault weapons have yet been introduced in Congress. It is expected that such a bill will be introduced sometime during 1989.

On the state level, the first proposed law restricting the availability of assault weapons was introduced by California State Representative Art Agnos (Dem., San Francisco) in 1985. (Agnos was elected mayor of San Francisco in 1987.) The law, which would have banned the sale and possession of specific assault weapons--such as the UZI, MAC, and AR-15--failed to pass. In 1988, Assemblyman Michael Roos (Dem., Los Angeles) introduced a measure that also would have banned specific assault weapons. The bill was later amended to require instead a 15-day waiting period with background check for all semi-automatic weapons. The amended version of the bill failed to pass. Roos expects to file a bill next year that would place a waiting period on specific assault weapons.[124]

In addition, product liability lawsuits have been filed against manufacturers of assault weapons. Such suits are based on the legal theory that the manufacturers of these weapons know that their products are inherently dangerous and prone to criminal misuse. Therefore, they should be held responsible for the resulting death and injury. One of the first product liability suits dealing with an assault weapon was filed on April 22, 1987, against Intratec USA, manufacturers of the TEC-9. The suit was filed by the estate of David L. Bengston of Connecticut. Bengston, a high school janitor, was fatally shot by an eighth grader on December 10, 1985, with a TEC-9 that belonged to the student's father. The student later held a classroom of children hostage until his father came and convinced him to turn over the weapon. In their complaint, attorneys for Bengston argued that the TEC-9 is in fact a super Saturday Night Special. The case is currently awaiting trial.[125]

The first victory for proponents of the legal theory that some handguns are inherently defective because of specific design characteristics occurred on October 3, 1985, when the Maryland Court of Appeals ruled in Kelley v. R. G. Industries that manufacturers of Saturday Night Specials could be held liable for their criminal misuse. The case stemmed from a March 1981 robbery in which the plaintiff, Olen J. Kelley, was shot in the chest with a Rohm handgun.[126] (As part of the law outlawing the sale of Saturday Night Specials passed in Maryland in 1988, the Maryland legislature--as part of a compromise with the gun lobby--added a component that would in effect nullify the Kelley decision.)

The signs are increasing of a growing awareness that America has an assault weapons "problem." At the end of its July 1988 documentary on handgun violence in America, "Guns, Guns, Guns," NBC reporter Connie Chung notes the increasing misuse of assault weapons like the UZI.[127] In his speech at the Democratic National Convention, Democratic presidential candidate Jesse Jackson, states of drug dealers, "They say, 'We don't have Saturday Night Specials any more.' They say, 'We buy AK-47s and UZIs, the latest lethal weapons. We buy them across the counter on Long Beach Boulevard.' You cannot fight a war on drugs unless and until you are going to challenge the bankers and the gun sellers...."[128]

CONCLUSION

Assault weapons are increasingly being perceived by legislators, police organizations, handgun restriction advocates, and the press as a public health threat. As these weapons come to be associated with drug traffickers, paramilitary extremists, and survivalists, their television and movie glamour is losing its lustre to a violent reality.

Because of this fact, assault weapons are quickly becoming the leading topic of America's gun control debate and will most likely remain the leading gun control issue for the near future. Such a shift will not only damage America's gun lobby, but strengthen the handgun restriction lobby for the following reasons:

- It will be a new topic in what has become to the press and public an "old" debate.

  Although handguns claim more than 20,000 lives year, the issue of handgun restriction consistently remains a non-issue with the vast majority of legislators, the press, and public. The reasons for this vary: the power of the gun lobby; the tendency of both sides of the issue to resort to sloganeering and pre-packaged arguments when discussing the issue; the fact that until an individual is affected by handgun violence he or she is unlikely to work for handgun restrictions; the view that handgun violence is an "unsolvable" problem; the inability of the handgun restriction movement to organize itself into an effective electoral threat; and the fact that until someone famous is shot, or something truly horrible happens, handgun restriction is simply not viewed as a priority. Assault weapons--just like armor-piercing bullets, machine guns, and plastic firearms--are a new topic. The weapons' menacing looks, coupled with the public's confusion over fully automatic machine guns versus semi-automatic assault weapons--anything that looks like a machine gun is assumed to be a machine gun--can only increase the chance of public support for restrictions on these weapons. In

addition, few people can envision a practical use for these weapons.

- Efforts to stop restrictions on assault weapons will only further alienate the police from the gun lobby.

Until recently, police organizations viewed the gun lobby in general, and the NRA in particular, as a reliable friend. This stemmed in part from the role the NRA played in training officers and its reputation regarding gun safety and hunter training. Yet, throughout the 1980s, the NRA has found itself increasingly on the opposite side of police on the gun control issue. Its opposition to legislation banning armor-piercing ammunition, plastic handguns, and machine guns, and its drafting of and support for the McClure/Volkmer handgun decontrol bill, burned many of the bridges the NRA had built throughout the past hundred years. As the result of this, the Law Enforcement Steering Committee was formed. The Committee now favors such restriction measures as waiting periods with background check for handgun purchases, and a ban on machine guns and plastic firearms. If police continue to call for assault weapons restrictions, and the NRA continues to fight such measures, the result can only be a further tarnishing of the NRA's image in the eyes of the public, the police, and NRA members. The organization will no longer be viewed as the defender of the sportsman, but as the defender of the drug dealer.

- Efforts to restrict assault weapons are more likely to succeed than those to restrict handguns.

Although the majority of Americans favor stricter handgun controls, and a consistent 40 percent of Americans favor banning the private sale and possession of handguns,[129] many Americans do believe that handguns are effective weapons for home self-defense and the majority of Americans mistakenly believe that the Second Amendment of the Constitution guarantees the individual right to keep and bear arms.[130] Yet, many who support the individual's right to own a handgun have second thoughts when the issue comes down to assault weapons. Assault weapons are often viewed the same way as machine guns and "plastic" firearms--a weapon that poses such a grave risk that it's worth compromising a perceived constitutional right.

Although the opportunity to restrict assault weapons exists, a question remains for the handgun restriction movement: How? Defining an assault weapon--in legal terms--is not easy. It's not merely a matter of going after guns that are "black and wicked looking." Although those involved in the debate know the weapons being discussed, it's extremely difficult to develop a

legal definition that restricts the availability of assault weapons without affecting legitimate semi-automatic guns. Most likely, any definition would focus on magazine capacity, weapon configuration, muzzle velocity, the initial purpose for which the weapon (or its full-auto progenitor) was developed, convertibility, and possible sporting applications. Any law based on this definition would, however, need to have a clause to excuse legitimate semi-automatic weapons that would inadvertently fall under it. And although legislation could be passed that would ban specific weapons, the world's arms manufacturers are expert at producing weapons that follow the letter, but not the intent, of the law. This often results in products that are virtually identical to the restricted weapon, yet different enough to remain on the market.

Yet, the framework for restricting assault weapons already exists. On the federal level, ATF currently excludes from import handguns recognized as Saturday Night Specials. This is done by application of criteria designed by the agency that takes into account such things as barrel length, caliber, quality of materials, safety devices, and other factors. Any gun that does not meet the importation threshold cannot be sold in the United States. Any manufacturer whose product is refused for import can challenge the decision in federal court. Criteria to identify and categorize assault weapons could be developed by ATF and applied toward restricting the availability of both foreign- and domestically-produced assault weapons.

The state of Maryland has taken a similar approach in banning the sale of Saturday Night Specials. The 1988 Maryland law established a nine-member board responsible for creating a roster of permitted handguns. The nine members of the board include: the superintendent of the state police; representatives of the Maryland States' Attorney's Association, Maryland Association of Chiefs of Police, Marylanders Against Handgun Abuse, the National Rifle Association, and a Maryland gun manufacturer; and three citizen board members to be determined by the governor. After January 1, 1990, the law requires that no person in Maryland may: manufacture a handgun not on the Handgun Roster, or sell or offer to sell any handgun not on the Handgun Roster that was manufactured after January 1, 1985. In determining whether a handgun has a legitimate use and can therefore be placed on the roster, the board will consider: concealability; ballistic accuracy; weight; quality of materials; quality of manufacture; and reliability as to safety, caliber, and detectability by standard security devices used at airports and courthouses.[131] States could develop similar rosters to ban the sale of assault weapons.

Since passage of the Maryland law, the NRA has collected enough signatures of Maryland residents to bring the measure to referendum on the November 1988 ballot. The NRA's opposition to such a panel is not surprising. The organization fears giving the government, at any level, the power to restrict the

availability of firearms--conjuring up images of a "gun czar." And although such proposals would solve the definitional problems posed by assault weapons, it would guarantee fierce opposition from the gun lobby.

The success of any proposed legislation to restrict assault weapons and their accessories depends not only on whether the American public pays attention to the topic, but agrees that these products are dangerous. Obviously, some aspects of America's fascination with assault weapons and their accessories are here to stay. Publications are clearly protected under the First Amendment of the Constitution. Yet the weapons themselves, and accessories such as laser sights and grenades requiring only the explosive charge, can be restricted and even banned at the local, state, or federal level. The fact that assault weapons are increasingly being equated with America's drug trade may play a major role in motivating the public to call for their restriction. Yet, recognizing the country's fascination for exotic weaponry and the popular images and myths associated with guns, it may require a crisis of a far greater proportion before any action is taken.

APPENDIX I

According to law enforcement officials, federal agencies, and handgun control organizations, the assault weapons of choice appear to be the following (all models are semi-automatic versions):

AK-47--The Kalashnikov rifle, also known generally as the AK-47, was developed in the Soviet Union in 1947 by Mikhail T. Kalashnikov. Semi-automatic versions of a Chinese model--the Model 56--are currently imported into the United States, as are models developed by other countries. The Chinese AK-47 produced by POLY Technologies and distributed in the United States by PTK International, Inc., is 34 3/8 inches long. With a folding stock, the weapon has an overall length of 34 5/8 with the stock extended, and approximately 30 inches folded. The weapon can accept 20-, 30-, 40-, and 75-round magazines.[132] Semi-automatic versions of the AK-47 retail for as little as $300.[133]

AR-15A2--The AR-15A2, commonly known as the AR-15, is manufactured by Colt Industries of Hartford, Connecticut. It is the civilian version of the company's M-16 machine gun. The AR-15A2 rifle has an overall length of 39 inches. The Government Model Carbine comes with a folding stock. Its overall length with the stock folded is 35 inches, 32 closed. In 1987 the company introduced the Delta HBAR, a sniper rifle version of the rifle. The weapon comes with a 5-round magazine, but can accept a variety of high-capacity magazines.[134] The AR-15A2 retails for approximately $680.

MAC-10, MAC-11--The MAC-10 machine pistol was originally developed by Gordon Ingram at Military Armaments Corporation (MAC) in 1969. Soon thereafter, the MAC-11 was marketed and subsequently semi-auto versions of both were developed. MAC went bankrupt in 1978. Currently, the rights for the MAC-10 are owned by a Stephensville, Texas, company which took the Military Armaments Corporation name. Manufacturing rights for the MAC-11 now belong to various corporate entities operated by Sylvia and Wayne Daniels of Georgia.[135] An ad placed in Shotgun News for the semi-auto 9mm M11/9 produced by the Daniels, describes it as "The Gun That Made the '80's' Roar" and characterizes it as being as "American as God, Mom, and Apple Pie!"[136] The 9mm MAC-11 is 12.15 inches long. It comes with a 32-round magazine. The 9mm MAC-10 has a length of 10.5 inches with its stock folded and comes with a 32-round magazine. Both have threaded barrels for the attachment of silencers and barrel extensions.[137] The MAC-11 can retail for as little as $200.

RUGER MINI-14--The Ruger Mini 14 is manufactured by Sturm, Ruger & Company, Inc. of Southport, Connecticut, and was introduced into the civilian market in 1975. With a folding stock, the weapon has an overall length of 37.75 inches, 27.5 with the stock closed. The gun comes with a standard 5-round magazine, but magazines have been developed for it that can hold up to 40 rounds.[138] The Mini-14 retails for approximately $330.

TEC-9--The 9mm TEC-9 assault pistol was originally developed by Interdynamics AB of Sweden and produced in the U.S. by F.I.E. of Florida. The original version, the KG-9, was easily converted to full auto and was subsequently reclassified as a machine gun by ATF in 1982. Soon after, the weapon was redesigned to sell as a semi-auto and reclassified the KG-99. Subsequently, a Hong Kong company bought the rights to the weapon from Interdynamics AB and a new company, Intratec USA, was formed in the United States to manufacture the weapon, now dubbed the TEC-9. In November of 1987, Intratec USA reorganized to become Intratec. Twelve and a half inches long, the lightweight TEC-9 comes with a 36-round magazine. The TEC-9M, a smaller version of the weapon, is 10.5 inches long. Both have threaded barrels so that they can accept silencers and barrel extensions. High-impact plastic is used for the gun's receiver, magazine well, and pistol grip.[139] Promotional material for the guns describe them as being "high-spirited" and "weapons that are as tough as your toughest customers."[140] The TEC-9 retails for approximately $250.

UZI--Manufactured by Israeli Military Industries, the 9mm UZI was designed in the early 1950s by Army Major Uziel Gal. In 1979, a semi-automatic version was first imported to the United States for civilian sale by Action Arms of Philadelphia. The UZI semi-auto carbine has an overall length of 24.4 inches with its stock folded, 31.5 with the stock open, and comes with a standard 25-round magazine. In 1984, the company introduced the UZI pistol, which has an overall length of 9.45 inches. In 1987, Israeli Military Industries introduced the Mini-UZI carbine, which with its stock folded has an overall length of 26.1 inches, 35.75 with the stock unfolded.[141] A 1988 Action Arms ad for the UZI exclaims, "When the going gets tough...the tough get an UZI. Whether for a backwoods camp, RV or family home, don't trust anything less. The UZI Carbine is the perfect choice for the sportsman who wants unfailing reliability and top performance in a rugged, compact size." With a kit that will allow the weapon to use .22 ammunition, the gun becomes "an inexpensive plinker."[142] The UZI carbine retails for approximately $700, the pistol for $510.

APPENDIX II

Paramilitary weapons are just the latest topic in the ongoing debate over the role of specific categories of firearms in American society. Unfortunately, there is often confusion among the press and public--and even among handgun restriction advocates--regarding the various types of firearms. In an article published in the April 1987, American Rifleman, National Rifle Association staff member Paul Blackman writes, "When a reporter calls a semi-automatic rifle, pistol or shotgun a "submachine gun"...He may just not know any better." Blackman's right. He points out that The Associated Press Stylebook and Libel Manual incorrectly defines a "submachinegun" as "A lightweight automatic or semiautomatic gun firing small arms ammunition."[143]

Recognizing this, descriptions of the various categories of firearms are as follows:

Firearms refer to weapons that use a powder charge to fire a projectile. (Airguns such as BB and pellet guns use a burst of air to fire their projectiles and hence are not considered firearms, although they are capable of inflicting severe or fatal injuries.)

Firearms have been broken down into essentially two groups: long guns and handguns. Long guns are weapons designed to be fired from the shoulder. According to ATF standards, to qualify as a rifle, the shoulder-fired weapon must have a barrel length of 16 inches, 18 inches for a shotgun.[144] Handguns are firearms designed to be fired from a single hand and are usually defined as having an overall length of less than 18 inches.[145] Repeating firearms are those that allow the shooter, by operating a mechanism on the gun, to load another round into the gun after a shot has been fired. Manually operating the bolt, lever, pump, or other mechanism extracts and ejects the empty case after the cartridge has been fired. It then reloads a fresh shell or cartridge from the magazine into the chamber and cocks the gun. Semi-automatic guns do this automatically when they fire. With each squeeze of the trigger the semi-automatic repeats the process of firing, ejecting, and reloading.[146] Although a semi-automatic will fire only one cartridge per trigger pull, an automatic will continue to fire cartridges as long as the trigger is pulled. An automatic is also known as a machine gun. More than 119 million rifles and shotguns have been produced in the U.S. since 1899.[147] It is estimated that the majority of these weapons remain in circulation.

Handguns can be either revolvers or semi-automatic pistols. Revolvers have a round cylinder that is actually the magazine and acts as a chamber when properly aligned with the barrel. In double-action revolvers, each time the trigger is pulled the weapon fires and the cylinder advances to the next chamber. Single-action revolvers require that the hammer be

manually cocked before each shot. A revolver's cylinder usually holds six cartridges. Instead of a revolving cylinder, a semi-automatic handgun (also known as a pistol) carries its extra cartridges in a magazine usually located in the handle of the handgun. Spring pressure forces the cartridges upward in the magazine. Each time the weapon is fired, a new cartridge is moved up and is loaded into the chamber. Pistol magazines usually hold between 14 and 17 cartridges.[148] Pistols are often known as "automatics" although they do require a separate trigger pull for each shot. Pistols that are fully-automatic, that is, that will continue to fire as long as the trigger is pulled, are known as machine pistols.

Handguns with barrel lengths of three inches or less are known as "snubbies." Snubbies are preferred by criminals because of their increased concealability. A subcategory of snubbies are Saturday Night Specials--inexpensive, inaccurate snubbies made of inferior materials. Because of their low quality and inaccuracy, these weapons have no sporting purpose and are best suited for criminal use. There are an estimated 35 to 40 million handguns in America.[149]

Assault firearms are semi-automatic (firing one bullet per trigger pull) and fully automatic (the weapon will keep on firing as long as the trigger is depressed) anti-personnel rifles, shotguns, and handguns that are designed primarily for military and law enforcement use. With muzzle velocities that are often greater than standard long guns, and high-capacity ammunition magazines, assault weapons are built to kill large numbers of human beings quickly and efficiently. Most assault weapons have no legitimate hunting or sporting use. Assault rifles and shotguns often have pistol grips and folding stocks, and are typically lighter and more concealable than standard long guns. Some assault pistols have threaded barrels for the easy attachment of silencers. Many assault weapons are merely semi-automatic versions of military machine guns, making them easier to convert to fully automatic machine guns.

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Exhibit E

BULLET HOSES

SEMIAUTOMATIC ASSAULT WEAPONS

What Are They? What's So Bad About Them?

Violence Policy Center

The Violence Policy Center (VPC) is a national non-profit educational organization that conducts research and public education on firearms violence and provides information and analysis to policymakers, journalists, advocates, and the general public. The Center examines the role of firearms in America, analyzes trends and patterns in firearms violence, and works to develop policies to reduce gun-related death and injury.

This report was authored by VPC Senior Policy Analyst Tom Diaz and edited by VPC Publications Coordinator Aimée Stenzel.

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- *"Officer Down"—Assault Weapons and the War on Law Enforcement* (May 2003)
- *Firearms Production in America 2002 Edition—A Listing of Firearm Manufacturers in America with Production Histories Broken Out by Firearm Type and Caliber* (March 2003)
- *"Just Like Bird Hunting"—The Threat to Civil Aviation from 50 Caliber Sniper Rifles* (January 2003)
- *When Men Murder Women: An Analysis of 2000 Homicide Data* (October 2002)
- *No Deal: The Drop in Federally Licensed Firearms Dealers in America* (September 2002)
- *Sitting Ducks—The Threat to the Chemical and Refinery Industry from 50 Caliber Sniper Rifles* (August 2002)
- *License to Kill IV: More Guns, More Crime* (June 2002)
- *American Roulette: The Untold Story of Murder-Suicide in the United States* (April 2002)
- *The U.S. Gun Industry and Others Unknown—Evidence Debunking the Gun Industry's Claim that Osama bin Laden Got His 50 Caliber Sniper Rifles from the U.S. Afghan-Aid Program* (February 2002)
- *"A .22 for Christmas"—How the Gun Industry Designs and Markets Firearms for Children and Youth* (December 2001)
- *Kids in the Line of Fire: Children, Handguns, and Homicide* (November 2001)
- *Unintended Consequences: Pro-Handgun Experts Prove That Handguns Are a Dangerous Choice For Self-Defense* (November 2001)
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- *Handgun Licensing and Registration: What it Can and Cannot Do* (September 2000)
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- *Gunland USA: A State-by-State Ranking of Gun Shows, Gun Retailers, Machine Guns, and Gun Manufacturers* (June 2000)
- *Guns For Felons: How the NRA Works to Rearm Criminals* (March 2000)
- *One Shot, One Kill: Civilian Sales of Military Sniper Rifles* (May 1999)
- *Cease Fire: A Comprehensive Strategy to Reduce Firearms Violence* (Revised, October 1997)

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TEN KEY POINTS ABOUT WHAT ASSAULT WEAPONS ARE AND WHY THEY ARE SO DEADLY

This study documents the following 10 important key points on the pages noted.

1. Semiautomatic assault weapons (like AK and AR-15 assault rifles and UZI and MAC assault pistols) are civilian versions of military assault weapons. There are virtually no significant differences between them. (Page 1)

2. Military assault weapons are "machine guns." That is, they are capable of fully automatic fire. A machine gun will continue to fire as long as the trigger is held down until the ammunition magazine is empty. (Page 1)

3. Civilian assault weapons are not machine guns. They are semiautomatic weapons. (Since 1986 federal law has banned the sale to civilians of new machine guns.) The trigger of a semiautomatic weapon must be pulled separately for each round fired. It is a mistake to call civilian assault weapons "automatic weapons" or "machine guns." (Page 1)

4. However, *this is a distinction without a difference in terms of killing power.* Civilian semiautomatic assault weapons incorporate all of the functional design features that make assault weapons so deadly. They are arguably more deadly than military versions, because most experts agree that semiautomatic fire is more accurate—and thus more lethal—than automatic fire. (Pages 1, 5-6, 11-14)

5. The distinctive "look" of assault weapons is not cosmetic. It is the visual result of specific functional design decisions. Military assault weapons were designed and developed for a specific military purpose—*laying down a high volume of fire over a wide killing zone*, also known as "hosing down" an area. (Pages 2-6)

6. Civilian assault weapons keep the specific functional design features that make this deadly spray-firing easy. These functional features also distinguish assault weapons from traditional sporting guns. (Pages 5-10)

7. The most significant assault weapon functional design features are: (1) ability to accept a high-capacity ammunition magazine, (2) a rear pistol or thumb-hole grip, and, (3) a forward grip or barrel shroud. Taken together, these are the design features that make possible the deadly and indiscriminate "spray-firing" for which assault weapons are designed. None of them are features of true hunting or sporting guns. (Pages 5-6)

8. "Spray-firing" from the hip, a widely recognized technique for the use of assault weapons in certain combat situations, has no place in civil society. Although assault weapon advocates claim that "spray-firing" and shooting from the hip with such weapons is never done, numerous sources (including photographs and diagrams)

show how the functional design features of assault weapons are used specifically for this purpose. (Pages 12-14)

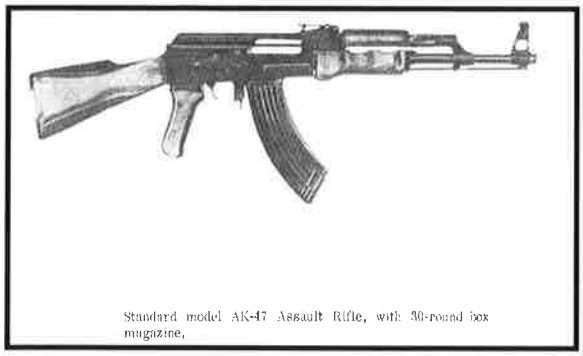
9. **Unfortunately, most of the design features listed in the 1994 federal ban—such as bayonet mounts, grenade launchers, threaded barrels, and flash suppressors—have nothing to do with why assault weapons are so deadly.** As a result, the gun industry has easily evaded the ban by simply tinkering with these "bells and whistles" while keeping the functional design features listed above. (Page 14)

10. **Although the gun lobby today argues that there is no such thing as civilian assault weapons, the gun industry, the National Rifle Association, gun magazines, and others in the gun lobby enthusiastically described these civilian versions as "assault rifles," "assault pistols," "assault-type," and "military assault" weapons to boost civilian assault-weapon sales throughout the 1980s.** The industry and its allies only began to use the semantic argument that a "true" assault weapon is a machine gun after civilian assault weapons turned up in inordinate numbers in the hands of drug traffickers, criminal gangs, mass murderers, and other dangerous criminals. (Pages 14-16)

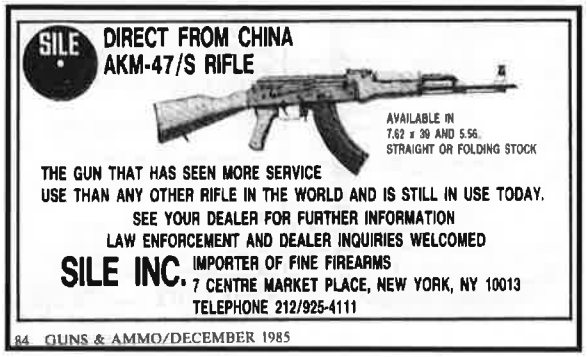
WHAT IS A SEMIAUTOMATIC ASSAULT WEAPON?

Semiautomatic assault weapons are civilian versions of automatic military assault rifles (like the AK-47 and the M-16) and automatic military assault pistols (like the UZI).

Assault Weapons



Military AK-47 Assault Rifle



Civilian AK-47 Assault Rifle

These guns look the same because they are virtually identical, save for one feature: military assault rifles (like the rifle on the left above) are machine guns. A machine gun fires continuously as long as its trigger is held back—until it runs out of ammunition. Civilian assault rifles (like the gun on the right) are *semi*-automatic weapons. The trigger of a semiautomatic weapon must be pulled back separately for each round fired.

Because federal law has banned the sale of new machine guns to civilians since 1986,[a] and heavily regulates sales to civilians of older model machine guns, there is virtually no civilian market for military assault weapons. The gun industry introduced semiautomatic versions of military assault weapons in order to create and exploit new civilian markets for these deadly weapons. The next section explains why civilian semiautomatic assault weapons are no less deadly than military automatic assault weapons. In fact, they are arguably even more deadly.

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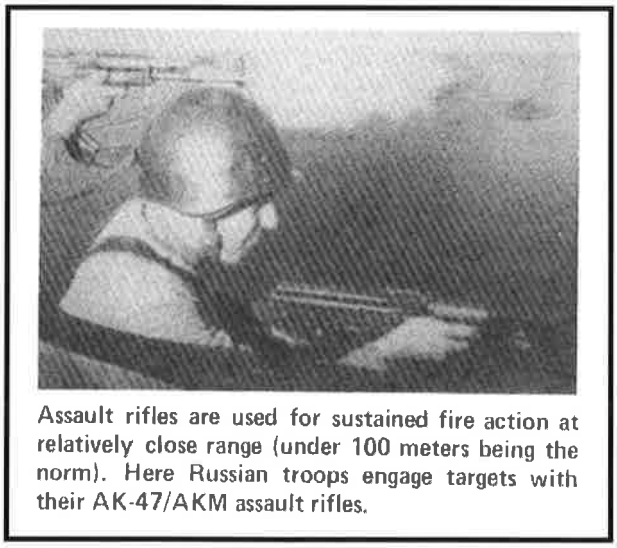
[a] See, 18 U.S. Code, Section 922(o).

WHAT'S SO BAD ABOUT SEMIAUTOMATIC ASSAULT WEAPONS?

Assault weapons did not "just happen." They were developed to meet specific combat needs. All assault weapons—military and civilian alike—incorporate specific features that were designed to provide a specific military combat function. That military function is *laying down a high volume of fire over a wide killing zone*, also known as "hosing down" an area. Civilian assault weapons keep the specific design features that make this deadly spray-firing easy. These features also distinguish assault weapons from traditional sporting firearms.

Assault Weapon Design Follows Specific Combat Function



Assault rifles are used for sustained fire action at relatively close range (under 100 meters being the norm). Here Russian troops engage targets with their AK-47/AKM assault rifles.

Illustration and caption from Chuck Taylor, *The Fighting Rifle: A Complete Study of the Rifle in Combat* (Boulder, CO: Paladin Press, 1984): 166.

The distinctive "look" of assault weapons is not merely "cosmetic," as the gun lobby often argues—the assault weapon's appearance is the result of the design of the gun following its function. A brief summary of how assault weapons came into being makes clear the reason for, and the nature of, their distinctive design features.

The problem of trench warfare. The roots of military assault weapons lie in the trench fighting of the First World War. The standard infantry weapon of that conflict was the long-range battle rifle. "Infantrymen in most armies were equipped with high-powered rifles: long, unwieldy, but accurate to ranges of 1,000 m (3,280 ft) or more. But a long weapon was a definite handicap in the close-quarter fighting of the trenches, and long-range capability was wasted when combat usually took place at ranges of tens of metres or less."[1]

Right—Troops in a World War I trench, fixing bayonets on battle rifles. Below—Springfield Model 1903, the U.S. Army's main battle rifle in World War I.

Submachine guns—the intermediate step. When armies bogged down in the World War I trenches, weapons designers looked for ways to break the bloody stalemate. Among them was the submachine gun, designed to be a "compact, fast-firing, short-range weapon" for use in the trenches and by highly mobile storm troops in new tactical formations.[2] According to the *Illustrated Book of Guns*, "A submachine gun (SMG) is a close-range, automatic weapon, firing pistol cartridges (e.g., 9mm Parabellum), and is compact, easy to carry, and light enough to be fired from either the shoulder or the hip."[3]

Among some famous American submachine guns are the more finely machined Thompson, or "Tommy Gun," shown on the right in the hands of British Prime Minister Winston Churchill, and its successor, the mass-produced M3 "Grease Gun," shown below. Both are chambered in .45ACP, a pistol cartridge.

The final step—the first assault rifle. The last step in the evolution of the military assault rifle came during the Second World War. It grew out of the German military's pre-war interest in "obtaining a relatively high-power intermediate or mid-range cartridge *and corresponding weapon* for infantry application."[4] (Emphasis added). On the one hand, the submachine gun was useful in close-range fighting, but the pistol cartridge it fired (typically 9mm) lacked power and range. On the other, German military thinkers realized that the battle rifle was too much gun for modern combat scenarios: "Since most infantry action took place at ranges under 400 meters, the long-range potential of the standard cartridge and service rifle were actually wasted."[5] There were also logistical problems in supplying armies in the field with different kinds of rounds of ammunition: the larger rifle cartridges for the battle rifle and the smaller pistol cartridges for the submachine guns.[6]

German MP-40 9mm submachine at left, and Mauser Karabiner 98k battle rifle below. Both guns shown in the field with French Nazi soldiers at right.

The solution to these logistical and firepower problems practically suggested itself:

> Logically, it was inescapable that sooner or later someone would consider a compromise between the long range, powerful, rifle and the rapid fire, but short range, submachine gun. During their Operation Barbarossa (Russian) campaign and elsewhere, the Germans were continually reminded of the ever-increasing need for a rapid fire arm that was small enough to be convenient to hand carry, but at the same time possessed sufficient range and power to be adequate out to about 200 meters.[7]

The result of German research and development was that very compromise. It came in the form of the STG (*Sturmgewehr)* ("storm gun") 44, the "father of all assault rifles....After the war it was examined and dissected by almost every major gunmaking nation and led, in one way and another, to the present-day 5.56mm assault rifles."[8]

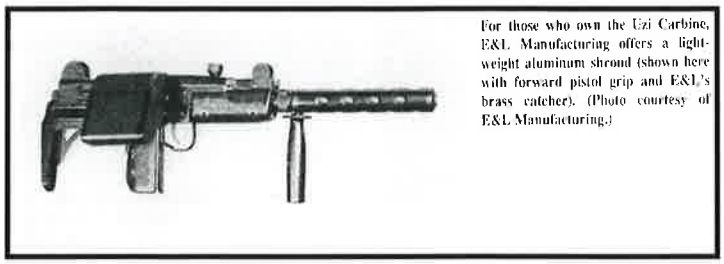
THE "FATHER OF ALL ASSAULT RIFLES"

Above, the Nazi army's Sturmgewehr (STG) 44, the first assault rifle.
Below, the STG 44 in combat action.

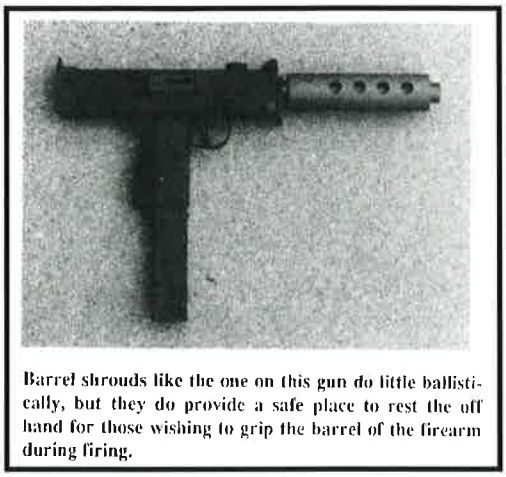
Deadly designs. One thing leaps out from these pictures: the remarkable similarity of the first assault rifle to the assault rifles currently flooding America's streets. This family resemblance is not a coincidence. From the STG-44 "storm gun" to the Bushmaster XM-15, assault weapons have incorporated into their design *specific* features that enable shooters to spray ("hose down") a large number of bullets over a broad killing zone, without having to aim at each individual target. These features not only give assault weapons a distinctive appearance, they make it easy to simply point the gun while rapidly pulling the trigger—including firing from the hip, a procedure seldom used in hunting anything but human beings. The most important of these design features are:

- ***"High-capacity," detachable ammunition magazines*** (often called "clips") that hold as many as 75 rounds of ammunition. "This allows the high volume of fire critical to the 'storm gun' concept."[9]
- ***A rear pistol grip*** (handle), including so-called "thumb-hole stocks" and magazines that function like pistol grips.
- ***A forward grip or barrel shroud.*** Forward grips (located under the barrel or the forward stock) "give a shooter greater control over a weapon during recoil."[10] Forward grips and barrel shrouds also make it possible to hold the gun with the non-trigger hand, even through the barrel gets extremely hot from firing multiple rounds. In the case of assault pistols

(like the UZI, MAC, and Intratec TEC series) the forward grip often appears as an ammunition magazine or a barrel shroud, a vented tube surrounding the gun barrel.



For those who own the Uzi Carbine, E&L Manufacturing offers a lightweight aluminum shroud (shown here with forward pistol grip and E&L's brass catcher). (Photo courtesy of E&L Manufacturing.)

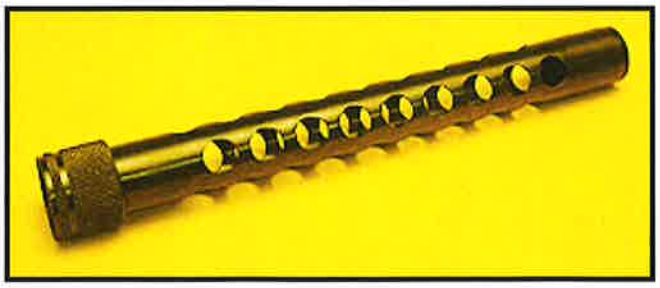


Barrel shrouds like the one on this gun do little ballistically, but they do provide a safe place to rest the off hand for those wishing to grip the barrel of the firearm during firing.

Barrel shrouds make it possible to hold a hot barrel during firing (right). Forward pistol grips help control recoil (above). Images and captions from Duncan Long, *The Terrifying Three*.[11]

Military assault rifles, like this Heckler & Koch G41 invariably accept a high-capacity magazine ("clip") and have some form of pistol grip and fore-end grip.

Barrel shrouds, like the one on the right sold by Bushmaster Firearms for use on the UZI, are "ventilated all around for maximum heat dissipation."



These design features create the ability to quickly lay down a high volume of fire, making semiautomatic assault weapons a particularly dangerous addition to the civilian gun market. They explain why assault weapons are favored by terrorists, mass killers, and violent criminals, and they distinguish such weapons from true hunting and target guns.

MODERN DESCENDANTS OF THE STG-44 ON AMERICA'S STREETS

Most of the assault weapons sold on America's civilian market are semiautomatic descendants of the STG-44. Here are a few of the more popular and notorious.

Kalashnikov AK-47 and its variants. The Soviet Army's AK-47 was derived from the STG-44 shortly after the Second World War, boosted by material and personnel that fell into Soviet hands when the Red Army overran German research and engineering facilities.[12] The AK-47 (in many variants, like the AKM) has become, since the 1940s, the most widely-distributed rifle in the world.[13] According to *The Gun Digest Book of Assault Weapons*:

"The AKM was the revolutionary weapon of the 1960s and '70s, used by everyone from the Viet Cong to the Palestine Liberation fighters. Its comparatively short length and light weight made war more available to Third World women and children, probably not an advance for civilization."[14]

Above: AK-47, foreground, AKM, upper right background.

China exported few guns to the United States before the 1980s. But, beginning in 1987, Chinese rifle imports—mostly semi-automatic versions of the AK-47—surged. The flood of Chinese rifles reached 64 percent of all rifles imported into the United States in 1993 and was only cut off by the administration of former President Bill Clinton. (See table at right.)[15]

China accounted for forty-two percent of all rifles imported into the U.S. civilian market between 1987 and 1994, the year in which President Clinton finally blocked the Chinese gun dumping (see Table 8).

Table 8

Rifle Imports from China to the United States, 1987 - 1994

	Total Rifles Imported	*Chinese Rifles Imported*	*Percent Chinese*
1987	452,059	100,897	22%
1988	484,976	182,935	38%
1989	350,012	141,382	40%
1990	273,102	31,370	11%
1991	339,966	115,902	34%
1992	420,085	164,271	39%
1993	764,498	490,399	64%
1994	698,907	344,648	49%
Total	3,783,605	1,571,804	42%

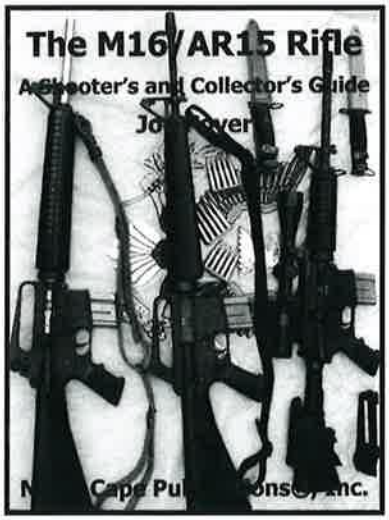
Source: U.S. Census Bureau, Foreign Trade Division

AR-15 Variant of the M-16. The U.S. Army's decision in the 1960s to replace its M-14 battle rifle with the M-16 assault rifle was based on reasoning similar to the German army's and highly revealing of the function of assault weapons. After studying over three million casualty reports from World Wars I and II, and data from the Korean War, the Army's Operations Research Office (ORO) found that, "in the overall picture, aimed fire did not seem to have any more important role in creating casualties than randomly fired shots. Marksmanship was not as important as volume. Fire was seldom effectively used beyond 300 meters due to terrain...and [ORO] discovered that most kills occur at 100 meters or less. From this data, ORO concluded that what the Army needed was a low recoil weapon firing a number of small projectiles....The [Armalite] AR-15 was chosen as the best small caliber weapon and it was adopted as the M16."[16]

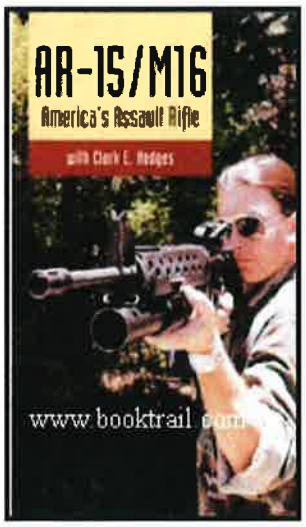
The U.S. Army adopted the M-16 assault rifle, right, in the 1960s. It saw extensive service during the Vietnam War.

Another expert's explanation of the Army's reasoning sheds light on one of the principal dangers of assault weapons on civilian streets—"spray and pray" firing:

> The studies showed that...in spite of the huge amounts of money spent by the military services in training combat infantrymen to be marksmen, few were capable of firing effectively beyond ranges of 200 to 300 meters in the heat of battle. "Spray and pray" would come to be the practice on the future battlefields of Vietnam.[17]



Books like these two illustrate that there is virtually no difference between the military M-16 and the civilian AR-15, the latter being only slightly modified for sale in the civilian market. The titles themselves show the popular equivalence.

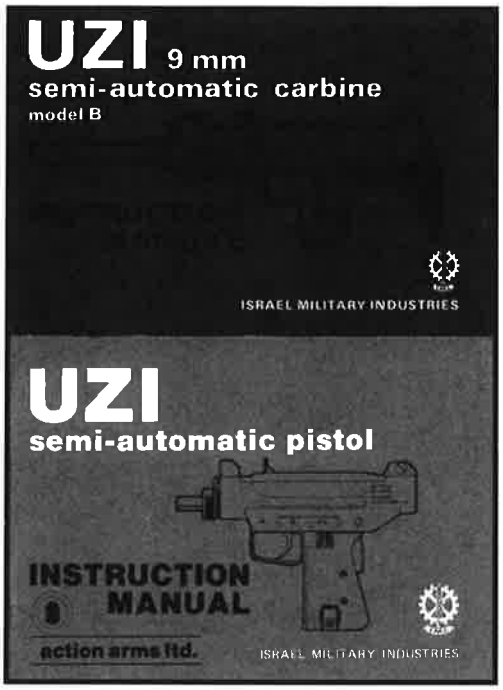


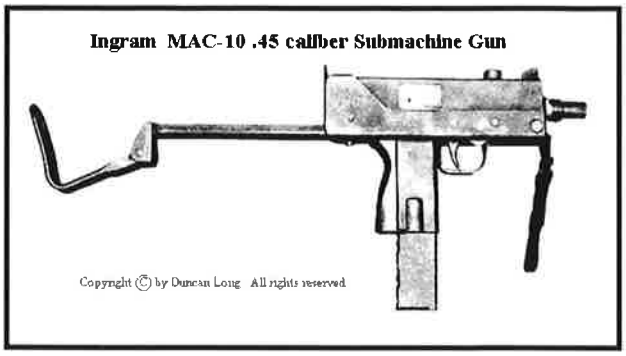
The gun industry was quick to begin churning out civilian versions of the M-16, labeling the semiautomatic models the "AR-15," not coincidentally the same name as the prototype version of the military assault rifle.

Bushmaster's version of the AR-15, left, achieved new heights of notoriety in 2002 when it was revealed that one model was the weapon used by the infamous Washington, DC-area snipers.

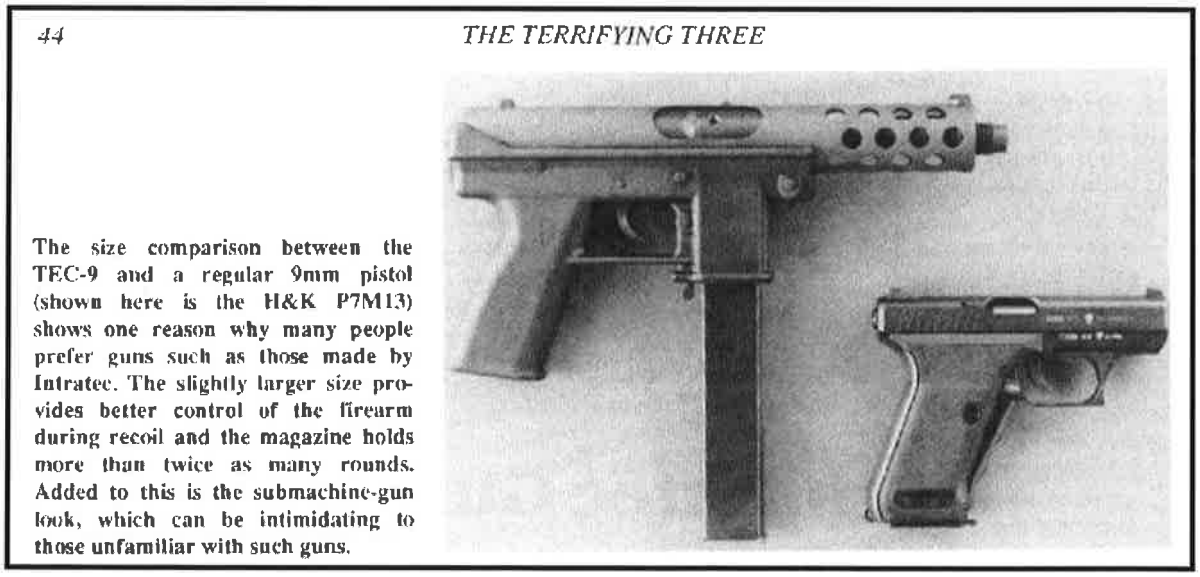
Assault Pistols—UZI, Ingram, Intratec, and More. A particularly deadly variant in the gun industry's marketing program has been the sale of civilian assault pistols, which are for the most part simply semiautomatic versions of submachine guns. Firearms expert Duncan Long explained the marketing basis of this trend in his book *The Terrifying Three: Uzi, Ingram, and Intratec Weapons Families*:

> As the militaries of the world increasingly rely on assault rifles to fill the submachine gun role, making money on a new submachine gun design becomes harder and harder. Consequently, a number of companies have tried to capture the police and civilian markets....Citizens purchasing firearms for everything from plinking to self-defense have provided a lucrative market, especially in the United States. Those weapons produced for the civilian market are generally semiauto versions of the automatic weapons, often modified slightly to conform to U.S. firearms laws.[18]





Lagging sales to the military spurred the gun industry to market to civilians semiautomatic versions of assault pistols such as the UZI and Ingram MAC series. Assault pistols like these quickly became the preferred weapon for criminal gangs, fringe groups like militias, and mass murderers.

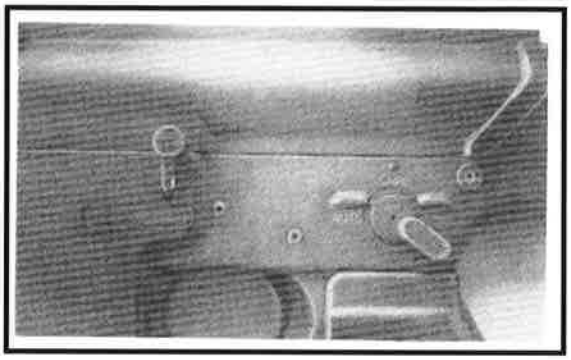


Firearms expert Duncan Long has succinctly summarized the perverse attractions of semiautomatic assault pistols like the Intratec TEC-9 shown above. (Image and caption from Duncan Long, *The Terrifying Three.*)[19]

THE GUN INDUSTRY'S LIES

The gun industry—aided by its apologists in the gun lobby, the NRA, and the gun press—has tried to divert attention from the inevitable consequences of its cynical marketing of these killing machines, and thwart regulation. This has been done by inventing what can only be fairly described as a series of lies and deceptions about assault weapons and their effects. Some of the more prominent among them are discussed below.

Is "automatic fire" an essential feature of a "real" assault weapon? The answer is, "absolutely not." But that hasn't kept the gun industry from using this line of argument to pretend that civilian assault weapons simply don't exist. The red herring of the automatic fire "issue" was raised by the gun lobby only after civilian assault weapons were widely criticized. This criticism came after mass murderers and drug traffickers began to "hose down" America's streets and schoolyards with civilian assault weapons.



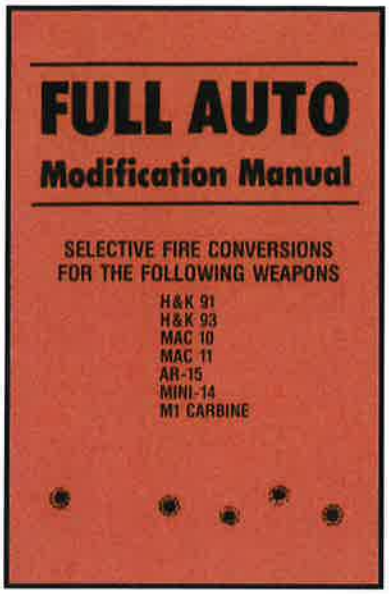
Military assault weapons, like the M-16 shown above, have a "selective fire" switch to change the mode of fire from semiautomatic to automatic (machine gun).

This argument is entirely semantic. By limiting the "definition" of assault weapon to military machine guns, the gun industry and its friends hope to define away the problem. But, fully automatic fire has little to do with the killing power of assault weapons. As the leading pro-assault weapons expert Duncan Long wrote in his 1986 publication, *Assault Pistols, Rifles and Submachine Guns*:

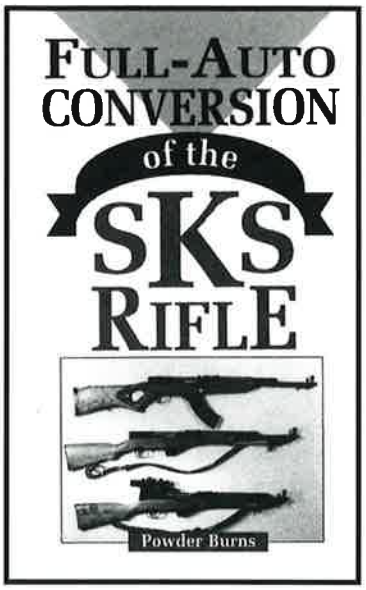
> The next problem arises if you make a semiauto-only model of one of these selective-fire rifles. According to the purists, an assault rifle has to be selective fire. Yet, if you think about it, it's a little hard to accept the idea that firearms with extended magazines, pistol grip stock, etc. cease to be assault rifles by changing a bit of metal.[20]

Long's point is well taken because, in fact, military and civilian experts agree that semiautomatic fire is actually *more*—not less—likely to hit the target than is automatic fire, and is thus more deadly.[21] In fact, expert Long wrote about the semiautomatic UZI in another book, "One plus of the semiauto version is that it has a greater potential accuracy...."[22] In any case, a person of moderate skill can fire a semiautomatic assault weapon at an extremely fast rate of fire.[23]

And even if automatic fire were more deadly, many semiautomatic assault weapons not only can be converted to automatic fire with home tools and modest skill, but readily available books and videos walk the would-be converter through the process.



Easily obtained videos and books like these show how to convert semiautomatic assault rifles to fully automatic machine guns (even though semiautomatic fire is more accurate).



Do assault weapons really encourage "spray firing"? Gun industry apologists also disparage the use of such terms as "spray firing" and "shooting from the hip" to describe the deadly capabilities of assault weapons. But, as was explained earlier, "spray and pray" was exactly the point of developing assault weapons. And the following illustrations show graphically how specific assault weapons features allow a "point-and-shoot" grip and help control recoil so the shooter can "hose down" a wide area with a lethal "spray" of bullets.

"Pray and Spray" Hip-Firing

Special Weapons

In the 1970's a SEAL [illegible] a suppressed Ingram submachine gun from the assault position at the range. The weapon is an Ingram M10 chambered for .45 ACP. The SEAL has the sliding stock extended and braced under his right arm. His left hand is holding the Sionics suppressor and he has just completed a short burst. Three fired casings being in the air above the weapon.
PHOTO CREDIT: UDT-SEAL MUSEUM

130. **Firing with the stock pressed to the body** is conducted without halting. Press the stock to the right side with the right arm, with the butt of the stock in the armpit or against the front part of the upper arm (Figure 73). If the stock is folded, press the rifle's receiver and pistol grip to the body with the right hand (Figure 56). Hold the rifle with the left hand at the fore end. Point the rifle at the target and, continuing movement, commence firing.

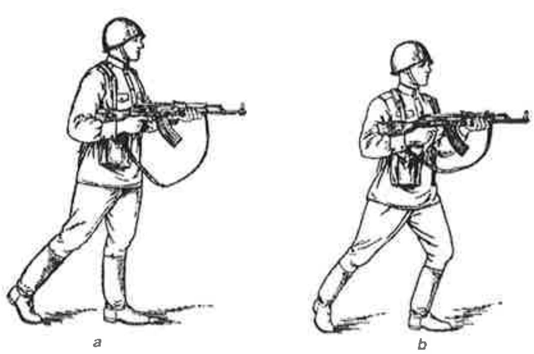


Figure 73. Firing on the move:

a - with stock pressed to side (armpit) b - with stock resting against upper arm

131. When firing on the move, reload the rifle without stopping movement.

[illegible] loosed at a 100-yard gong. The arm functioned flawlessly, and the iron plate reverberated with pleasing regularity. Recoil was virtually nil and even the report was not prohibitive. Ejection was positive, with the cases being tossed cavalierly to the

continued on page 70

Our test 9mm AR-15 was found to be a natural pointer. Target acquisition was rapid, even in instinctual shooting from waist level.

Deliberate, aimed fire from the shoulder may be more accurate than the kind of "pray

and spray" hip-firing illustrated on the prior page. But the mass murderers, criminal gangs, drug traffickers, and other violent criminals who are drawn to assault weapons are not after marksmanship medals. They want to kill or maim as many people as possible in as short a time as possible—the exact job for which the semiautomatic assault weapon was designed.

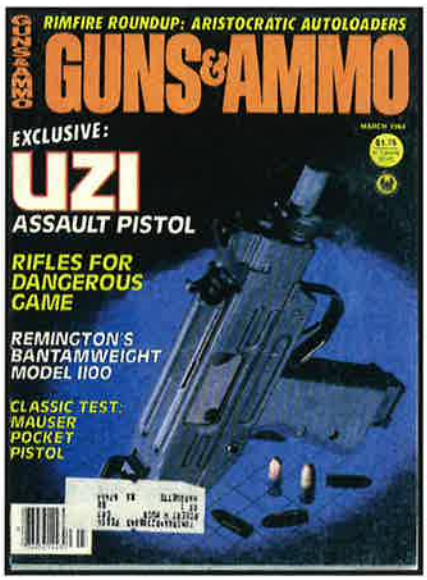
But what about harmless bayonet mounts? Unfortunately, the 1994 federal assault weapons ban attempted to define assault weapons on the basis of parts usually associated with military weapons, such as grenade launchers, bayonet mounts, and threaded barrels for adding silencers and flash suppressors (to reduce flash from the weapon's muzzle at night). The problem is that these features have virtually nothing to do with the functional design of the assault weapon. As a result, gun manufacturers have simply eliminated these "bells and whistles" from their civilian assault weapon designs, while keeping the lethal design factors—high-capacity magazines and pistol grips—that make assault weapons so deadly. These cosmetic changes meet the letter of the federal law, but accomplish little else.

Don't gun experts say there is no such thing as a civilian "assault gun?" The NRA, the gun industry, the gun press, and other pro-gun "experts" today claim that there is no such thing as a civilian "assault weapon." But before the guns came under fire, these same experts enthusiastically described exactly these civilian versions as "assault rifles," "assault pistols," and "military assault" weapons.

For example, in 1982, *Guns & Ammo* published a book titled *Assault Rifles*, advertising "complete data on the best semi-automatics."[24] In 1984, *Guns & Ammo* advertised a similar publication, now titled *Assault Firearms* (see ad on right), "full of the hottest hardware available today....covers the field with...assault rifles from the armies of the world....a new slant on .22s with 'Plinkers in Battle Dress.' And, if you are interested in survival tactics and personal defense, we'll give you a look at the newest civilianized versions of the semi-auto submachine gun."[25]

In 1988, *Guns & Ammo* handgun expert Jan Libourel defined an "assault pistol" simply as, "A high-capacity semi-automatic firearm styled like a submachine gun but having a pistol-length barrel and lacking a buttstock."[26] This definition handily fit guns like the UZI and Intratec TEC-9 that were regularly advertised on the pages of *Guns & Ammo* during the 1980s as "assault pistols." A 1989 ad in *Guns & Ammo* for the Intratec TEC-9 (a precursor to the one used in the 1999 Columbine high school shootings) flatly declared that "the TEC-9 series clearly stands out among high capacity 9mm assault-type pistols."[27]

***Guns & Ammo*, the leading gun magazine, regularly called civilian semiautomatic assault weapons "assault firearms," "assault rifles," and "assault pistols" until a series of tragic shootings caused the industry to deny there was such a thing as a civilian assault weapon.**



Gun magazines also specifically praised the spray-fire features of civilian assault weapons. For example, a 1989 *Guns & Ammo* review of the "Partisan Avenger .45 Assault Pistol" (right) noted that when the gun "is fired rapidly from the hip, its swivelling front grip makes for easy and comfortable control of the recoil" and that the "forward pistol grip extension of this powerful assault pistol not only helps point it instinctively at the target but goes a long way to controlling the effects of recoil...."[28] *Guns & Ammo* found hip-shooting "surprisingly easy" with the HK 94 9mm Carbine.[29] A 1990 review in the NRA's *American Rifleman* of the Sites Spectre HC Pistol stated: "A gun like the Spectre is primarily intended for hip-firing...."[30] The same magazine's 1993 review of the Steyr Mannlicher SPP Pistol reported: "Where the SPP really shines is in firing from the hip."[31] A cottage industry of accessory suppliers also sprang up, all of which targeted ads soliciting owners of civilian "assault weapons."[32]

The gun industry itself deliberately used the military character of semiautomatic "assault weapons" and the lethality-enhancing utility of their distinctive characteristics as selling points. The German company Heckler & Koch, for example, published ads calling their civilian guns "assault rifles" and stressing their military lineage. "The HK 91 Semi-Automatic Assault Rifle from Heckler & Koch...was derived directly from the G3," a German army weapon, said one full page ad (right).[33] Another described the HK 94 Carbine as "a direct offspring of HK's renowned family of MP5 submachine guns."[34] An Intratec ad said the company's TEC-9 "clearly stands out among high capacity assault-type pistols."[35] Magnum Research advertised that the Galil rifle system to which it had import rights "outperformed every other assault rifle."[36]

Early gun magazine reviews of assault guns also specifically noted their limited sporting value. For example, the NRA's *American Rifleman* reviewed the Calico M-100 rifle in 1987 and concluded, "The M-100 is certainly not a competition gun, hardly a hunting gun, and is difficult to visualize as a personal defense gun.[37] Similarly, a 1983 *Guns & Ammo* review of the Heckler & Koch HK 94 rifle reported that "you certainly aren't going to enter any serious, formal matches with it...."[38]

At the same time, the gun industry has actively promoted the intimidating looks of assault weapons to increase their sales. A 1989 *Guns & Ammo* review of the A.A. Arms AP9 praised the appeal of the gun's "wicked looks" to teenagers, noting "it is one mean-looking dude, considered cool and Ramboish by the teenage crowd....Take a look at one. And let your teen-age son tag along. Ask him what *he* thinks."[39] (Emphasis in original). *Guns & Ammo* expert Garry James noted in his review of Colt's 9mm AR-15 rifle that "the intimidation factor of a black, martial-looking carbine pointing in one's direction cannot be underestimated."[40] Howard French, of the same magazine, said of the HK 94 9mm Para Carbine that "you would not get much static from an intruder eyeballing its rather lethal appearance."[41] C.A. Inc. advertisements for the Mark 45 and Mark 9 "Tommy-Gun" style carbines explicitly made the point that a "show of force can be stopping power worth having"[42]

SUMMING UP

The plain truth is that semiautomatic assault weapons look bad because they are bad. They were designed and developed to meet a specific military goal, which was killing and wounding as many people as possible at relatively short range as quickly as possible, without the need for carefully aimed fire. In short, they are ideal weapons for war, mass killers, drug gangs, and other violent criminals.

TEC-DC9 in use, surveillance tape, Columbine High School.

Endnotes

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21. See, "How Effective is Automatic Fire?," *American Rifleman*, May 1980, 30.

22. Duncan Long, *The Terrifying Three: Uzi, Ingram, and Intratec Weapons Families* (Boulder, CO: Paladin Press, 1989): 11.

23. See, e.g., "Calico M-100 rifle," *American Rifleman*, January 1987, 60, 61 ("the full 100 rounds were sent downrange in 14 seconds by one flicker-fingered tester").

24. Advertisement, *Guns & Ammo*, July 1982, 20.

25. Advertisement, *Guns & Ammo*, July 1984, 16.

26. "Handgunner's Glossary," *Guns & Ammo*, August 1988, 42.

27. Advertisement, *Guns & Ammo*, January 1989, 77.

28. "Partisan Avenger .45 Assault Pistol," *Guns & Ammo Handgun Annual,* 1989, 26-30.

29. "H&K's 9mm Para Carbine," *Guns & Ammo*, November 1983, 44.

30. "Sites Spectre HC Pistol," *American Rifleman*, December 1990, 58.

31. "Steyr Mannlicher SPP Pistol," *American Rifleman*, August 1993, 70, 72; see also, "Colt's 9mm AR-15," *Guns & Ammo*, July 1985, 35, 76 ("fired from the hip....about as natural a pointer as you can get.")

32. See, e.g., Assault Systems advertisements in *Guns & Ammo*, July 1981, 90 ("assault rifle case"), 92 ("lightweight assault bipod"); *Guns & Ammo*, November 1983, 101 ("assault rifle cases" and "padded Assault Rifle sling"); Beeman advertisement in *Guns & Ammo*, December 1982, 14 ("Beeman Short Scopes: New

for Assault Rifles to Airguns...Use on assault rifles...."); Ventech Inc. advertisement for "Assault Weapon Accessories" in *Guns & Ammo*, February 1991, 96 ("Mini-14...10/22...AR-7").

33. Heckler & Koch advertisement in *Guns & Ammo*, July 1984, 9.

34. Heckler & Koch advertisement in *Guns & Ammo*, June 1984, back cover.

35. Intratec advertisement, *Guns & Ammo*, January 1989, 77.

36. Magnum Research advertisement, *Guns & Ammo*, November 1982, 59. See also, e.g., advertisement by Paragon S&S Inc. for AR 10, *Guns & Ammo*, July 1981, 90 ("Used world wide by military and LAW ENFORCEMENT officers. This famous assault rifle is now available in a semi-auto form!")

37. "Calico M-100 rifle," *American Rifleman*, January 1987, 60, 61.

38. "H&K's 9mm Para Carbine," *Guns & Ammo*, November 1983, 44.

39. "A.A. Arms AP9 Assault Pistol," *Guns & Ammo Handgun Annual*, 1989, 48, 51.

40. "Colt's 9mm AR-15," *Guns & Ammo*, July 1985, 35, 76.

41. "H&K's 9 mm Para Carbine," *Guns & Ammo*, November 1983, 42.

42. CA Inc. advertisement, *Guns & Ammo*, March 1981, 92.

About the Violence Policy Center

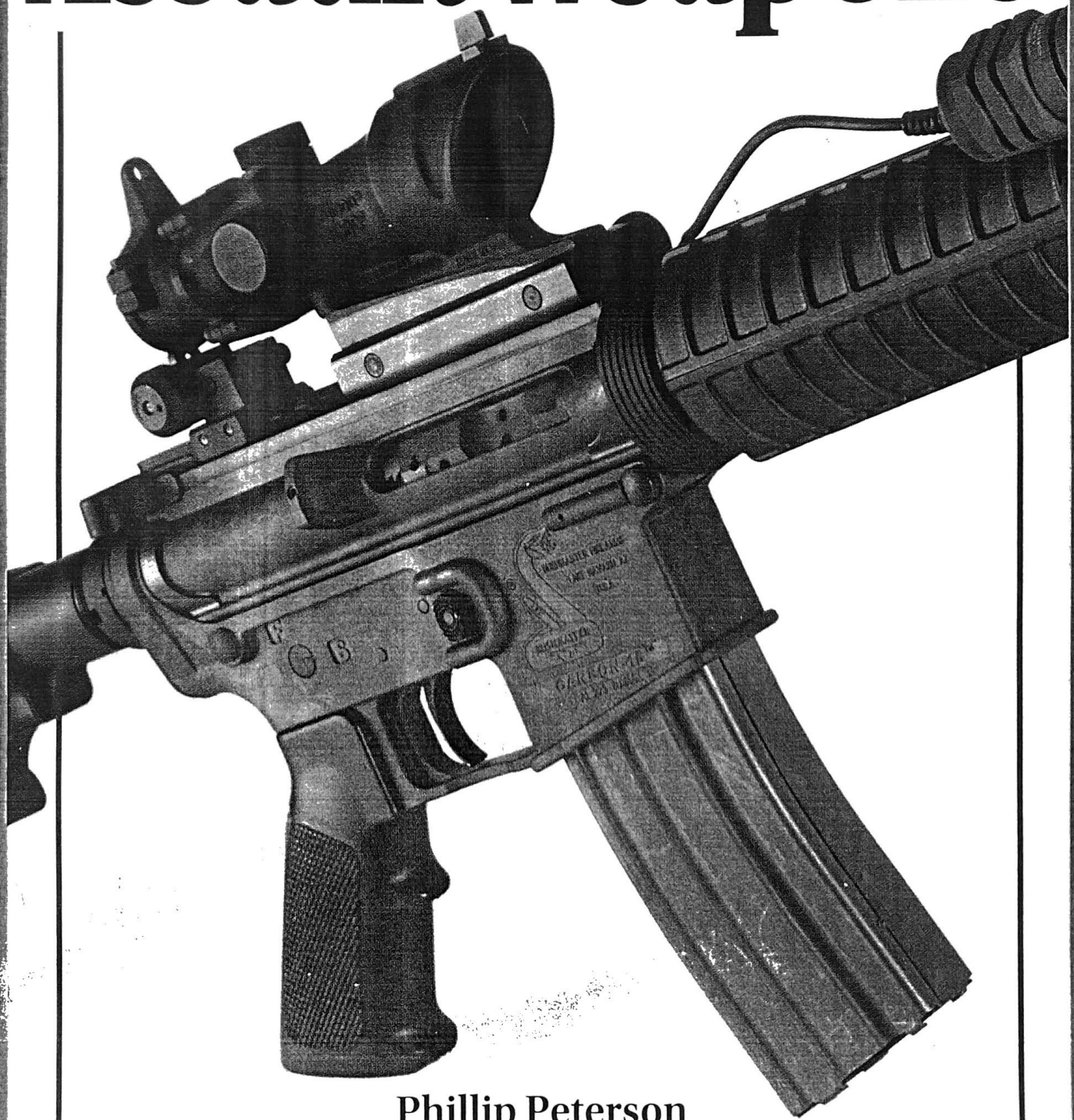
The Violence Policy Center (VPC) is a national nonprofit educational organization working to reduce death and injury from firearms. As America's premier think tank on gun policy, the VPC studies current firearms issues and provides information to policymakers, journalists, public health professionals, and grassroots activists.

The virtually unrestricted distribution of firearms is more than a crime problem, it is a national health crisis. Unlike every other consumer product, firearms are exempt from federal health and safety laws. Guns—especially handguns and assault weapons—are inherently dangerous products, and the failure to regulate them like all other products costs thousands of lives and billions of dollars every year. By conducting research on key issues in firearms policy, the VPC counters the gun lobby's distortions and brings hard facts to the debate over firearms death and injury.

Exhibit

GUN DIGEST®

Buyer's Guide to Assault Weapons



Phillip Peterson

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Introduction: What's in a Name?

Assault Weapon.

Those words, on the cover of this book, are probably what drew you to pick it up. "Assault weapon" is a term that causes arguments within the pro-gun community. Any use of the terms "assault weapon" or "assault rifle" by media or politicians is attacked by some pro-gun writers, organizations and many firearm owners. Long wordy debates take place on internet message boards arguing the definitions and usage of terms.

Why is that?

The main reason seems to be that the term has gained use by the anti-gun movement and media. Whenever a crime is committed with a semi-automatic military pattern firearm, the mainstream media will quickly jump in with headlines like "assault weapon used in killing spree" or "drug sweep nets assault weapons." The only time many in the non-gun owning public are exposed to this class of firearms is through negative media exposure.

If you use the historically applied terminology, an assault weapon must be capable of full-automatic fire, i.e., a machine gun. The term assault rifle had its beginning with the Germans during WWII and was applied to a new class of firearm: the "SturmGewehr," or storm rifle, properly known as the MP-44.

This is generally considered to be the first true assault rifle. It was a select-fire rifle that used an intermediate-sized rifle cartridge called the 8x33mm Kurz (short).

The intermediate cartridge concept helps define an assault rifle in military circles. The intermediate cartridge is smaller than the rifle cartridges used in belt-fed machine guns and larger than the pistol cartridges used in submachine guns. Intermediate cartridges are what many semi-automatic assault weapons chamber. These include the 5.56mm (.223), 7.62x51mm (.308), 7.62x39mm, and 5.54x39mm.

What is an assault weapon? If one were to use a strict definition, it could be ANY object that is used against another individual to cause bodily harm. That can be a firearm, a rock or a feather poked in the eye. The military definition was discussed in the last paragraph. In the context of this book, however, "assault weapon" refers to a semi-automatic firearm that accepts high capacity magazines (10+ rounds) and is patterned after military issue select-fire weapons. This can mean an exact copy of an existing design, minus the components that allow full-automatic fire. Or it can be a new design that utilizes similar characeristics.

The popularly-held idea that the term "assault weapon" originated with anti-gun activists, media or politicians is wrong. The term was first adopted by the manufacturers, wholesalers, importers and dealers in the American firearms industry to stimulate sales of certain firearms that did not have an appearance that was familiar to many firearm owners. The manufacturers and gun writers of the day needed a catchy name to identify this new type of gun.

The fact that some of the semi-automatic versions of the military-style firearms retained their bayonet lugs, extended pistol grips, high capacity magazines, folding stocks and even threading for muzzle brakes and grenade launchers has been used to erroneously define "assault weapons." But these design features were part of the attraction to this kind of firearm. All of these features are merely cosmetic and there is little if any evidence that their inclusion on a gun has been essential to some specific criminal use.

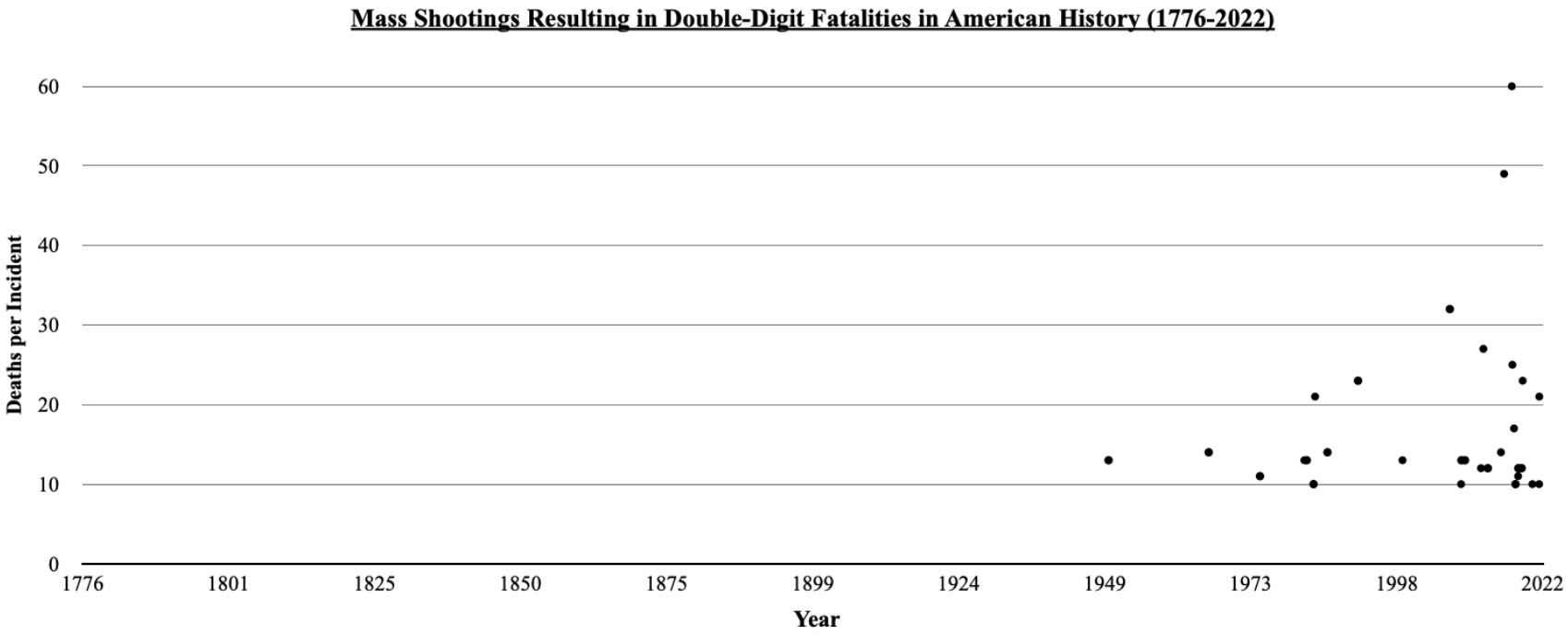
Look in many 1980s-era editions of *Gun Digest* and you will find listings of several makes and models of guns that were categorized as assault rifles or assault pistols. There were also some issues of a magazine called *The Complete Book of Assault Rifles* published in the 1980s. *Guns & Ammo* magazine published at least one issue of a magazine with the title *Assault Rifles: The New Breed of Sporting Arm*. And the truth is that many gun owners have used and still use the term in everyday conversations about firearms.

Some alternate monikers suggested by the never-call-them-assault-weapons crowd include paramilitary firearms, military pattern semi-automatics, homeland defense rifles, tactical firearms, sports

utility rifles, EBRs (Evil Black Rifles), or simply firearms. I tend to favor the term neat guns, but that could be just about any gun. There needs to be a commonly understood name for this type of firearm that does not require a drawn out definition. It really should not be that complicated.

Whatever arguments can be made about what terminology to use, the name assault weapon has been defined by law with the passage of several state and local AW laws and by the Federal Assault Weapon Ban, also known as the Crime Control and Law Enforcement Act of 1994. This law, and most of the others, regulate these firearms by model name and characteristics. (See the chapter on legal issues to read the exact wording of the currently expired Federal AW law.) By using the term "assault weapon" throughout the text of the law, they have forever added this name to the American dictionary.

Exhibit


Mass Shootings Resulting in Double-Digit Fatalities in American History (1776-2022)
Deaths per Incident
60
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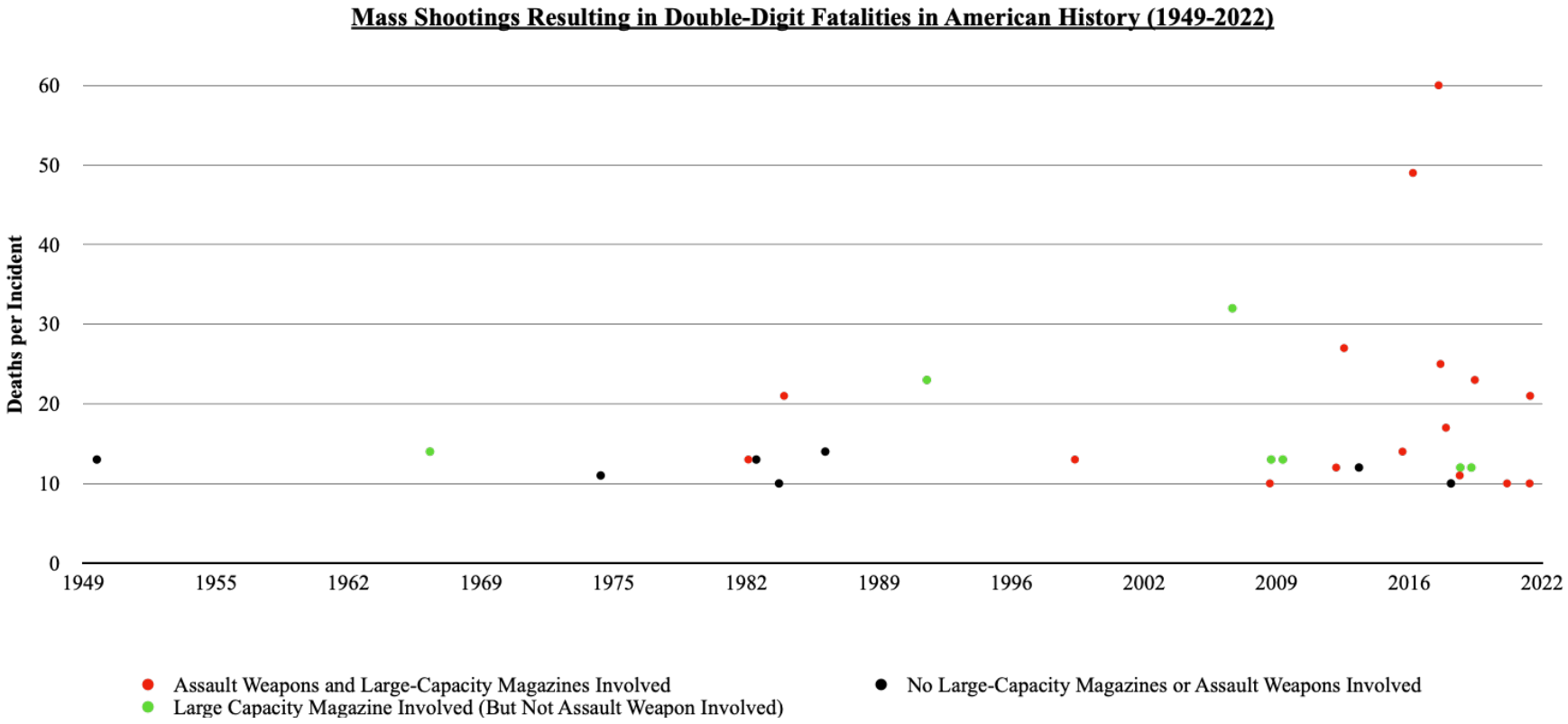
Mass Shootings Resulting in Double-Digit Fatalities in American History (1949-2022)
Deaths per Incident
60
50
40
30
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10
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1949
1955
1962
1969
1975
1982
1989
1996
2002
2009
2016
2022
Assault Weapons and Large-Capacity Magazines Involved
Large Capacity Magazine Involved (But Not Assault Weapon Involved)
No Large-Capacity Magazines or Assault Weapons Involved

Exhibit

LOUIS KLAREVAS

RAMPAGE NATION

SECURING AMERICA FROM MASS SHOOTINGS

Prometheus Books
59 John Glenn Drive
Amherst, New York 14228

in a class all by itself. No other advanced, Western democracy experiences the magnitude of gun violence that presently afflicts American society.[28] This is particularly true when it comes to mass shootings.[29]

☆ ☆ ☆

The United States does little to regulate firearms, especially at the federal level.[30] While it goes to great lengths to restrict access to WMDs and IEDs, the same can't be said for its efforts to keep firearms out of the hands of high-risk individuals. Indeed, the American experience with gun control nationwide is so limited that it can actually be chronicled in a few bullet points:

- The National Firearms Act of 1934: Heavily regulated machine guns, short-barrel rifles and shotguns, and silencers.
- The Federal Firearms Act of 1938: Established a federal licensing system to regulate manufacturers, importers, and dealers of firearms.
- The Omnibus Crime Control and Safe Streets Act of 1968: Prohibited anyone under twenty-one years of age from purchasing a handgun.
- The Gun Control Act of 1968: Required that all interstate firearms transfers or sales be made through a federally licensed firearms dealer and prohibited certain categories of people—felons (indicted or convicted), fugitives, drug abusers, mentally ill persons (as determined by adjudication), illegal aliens, dishonorably discharged servicemen, US-citizenship renouncers, and domestic abusers—from possessing firearms.[31]
- The Firearm Owners Protection Act of 1986: Barred the purchase or transfer of automatic weapons without government approval.
- The Undetectable Firearms Act of 1988: Required that all firearms have at least 3.7 oz. of metal that can be detected by a metal detector.
- The Gun-Free School Zones Act of 1990: Criminalized possession or discharge of a firearm in a school zone.
- The Brady Handgun Violence Prevention Act of 1993: Required

that anyone attempting to purchase a firearm from a federally licensed dealer pass a background check.[32]

- The Federal Assault Weapons Ban of 1994: Banned the sale and possession of semiautomatic assault weapons and extended-capacity magazines not grandfathered prior to the enactment of the law.[33]

Of all of these measures, the National Firearms Act of 1934 and the Assault Weapons Ban of 1994 (AWB) were the only ones instituted primarily in an effort to reduce the carnage of mass shootings. The former was passed in response to a series of bloody gangland executions, including the infamous 1929 St. Valentine's Day massacre in Chicago.[34] While there are still machine guns in circulation, the National Firearm Act, in conjunction with the Firearm Owners Protection Act of 1986, sharply cut the availability of machine guns, which likely explains the complete elimination of massacres perpetrated with such automatic-fire weapons.

Like the National Firearms Act, the AWB was introduced following several high-profile mass shootings in the early 1990s: the Luby's restaurant, 101 California Street office complex, and Long Island Railroad train car massacres.[35] Signed into law by President Bill Clinton, the AWB went into effect on September 13, 1994. At the insistence of the gun-rights lobby, however, the bill contained a ten-year sunset provision. As Congress never renewed the ban, it automatically expired on September 13, 2004.

The decade the law was in effect nonetheless resulted in a unique experiment, allowing us to discern what impact, if any, the ban had on gun violence in general and mass shootings in particular. As to the former, the academic consensus seems to be that the AWB had a minimal impact on reducing violent crime.[36] This hardly comes as a surprise. After all, most crimes don't involve assault weapons. The real test should be: Did it succeed in its intended purpose of reducing rampage violence? The answer is a resounding yes.

Let's take a closer look.

The best way to assess the impact of something is to conduct what, in social science, we commonly refer to as a time-series analysis. Basically, that's a fancy name for a before-and-after test. Figures 7.1

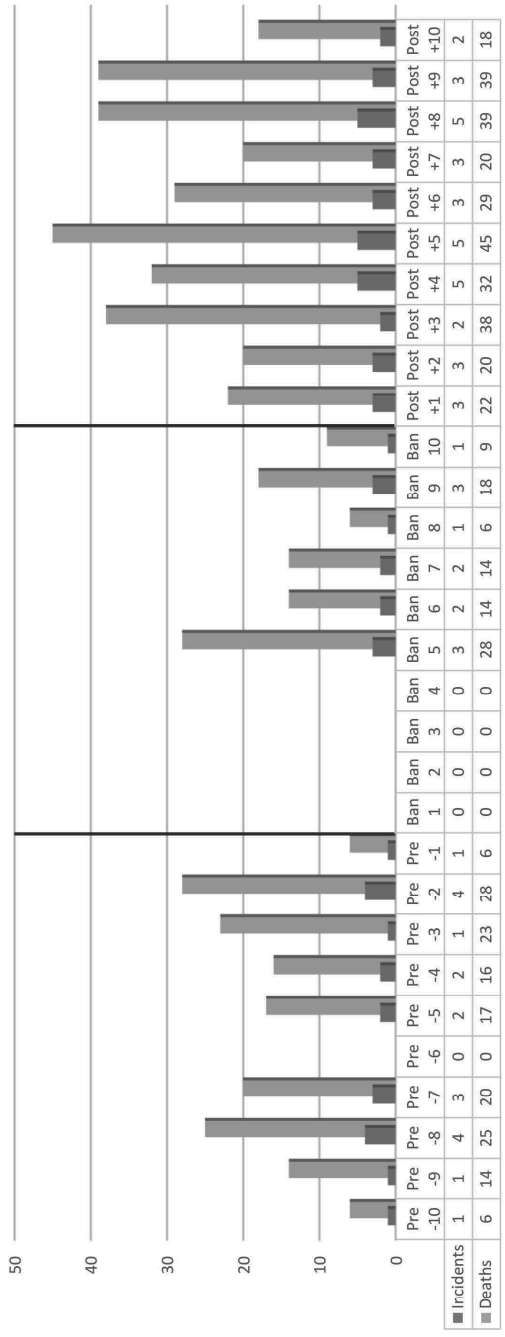

Fig. 7.1. Gun Massacres Before, During, and After the Assault Weapons Ban of 1994.
Note: The lines in the graph demarcate the start and end points of the Assault Weapons Ban, which was in effect from September 13, 1994, through September 12, 2004. The data are drawn from Table 3.2.

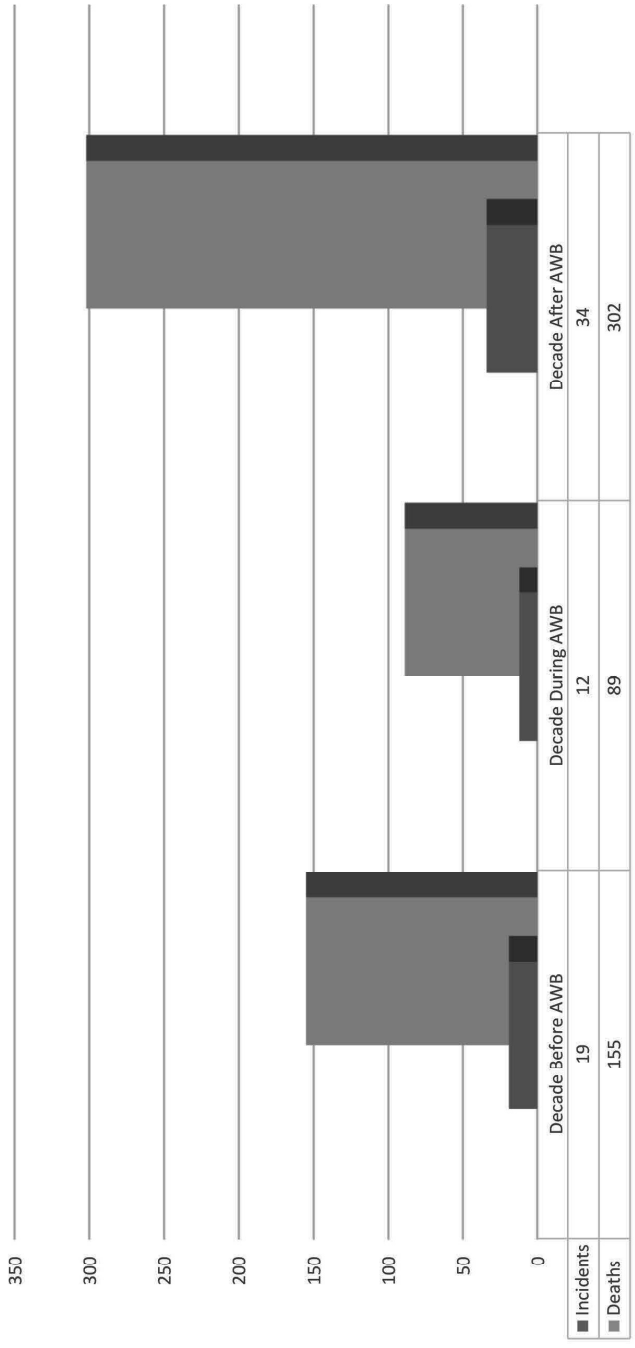

Fig. 7.2. Gun Massacres by Decade Before, During, and After the Assault Weapons Ban of 1994.
Note: The Assault Weapons Ban was in effect from September 13, 1994, through September 12, 2004.
The data are drawn from Table 3.2.

and 7.2 provide a look at the before-and-after pictures. In the decade prior to the enactment of the AWB, the United States experienced nineteen gun massacres that resulted in 155 cumulative deaths, for an average death toll of 8.2 fatalities per incident. During the ten-year period that the AWB was in effect, the numbers declined substantially, with only twelve gun massacres, resulting in eighty-nine deaths, for an average of 7.4 fatalities per incident.[37] What's particularly astounding about this time period is that during the first four and a half years of the ban, there wasn't a single gun massacre in the United States. Not one. This is unprecedented in modern American history.[38] Since 1966, the longest streaks without a gun massacre prior to era of the AWB were two instances of consecutive years (1969–1970 and 1979–1980).[39] Then, all of a sudden, from September 1994 to April 1999, the country experienced a long calm. As further evidence of the AWB's effectiveness, once it expired, rampages returned with a vengeance. In the ten years after the ban, the number of gun massacres nearly tripled to thirty-four incidents, sending the total number of deaths skyrocketing to 302, for an average of 8.9 fatalities per incident.[40] These numbers paint a clear picture: America's experiment, while short-lived, was also extremely successful.[41]

ZEROING OUT GUN MASSACRES

The biggest takeaway from America's experience with a ban on assault weapons and extended-capacity magazines is that gun-control legislation can save lives. But is there a way to get to zero? Is there a way to eliminate gun massacres once and for all? For that, we have to look overseas for insights.

One of the biggest obstacles to successful gun control is the ability to transport firearms across open, contiguous borders. In the United States, it's a problem that allows guns to flow freely from states with lax laws into states with strict laws. A common complaint frequently leveled by elected officials in places like California, Illinois, Maryland, New York, and Massachusetts is that people just need to drive across a state line and they can readily obtain firearms that they can then easily—if perhaps illegally—bring back into their jurisdictions.[42] That

Exhibit

The Effect of Large-Capacity Magazine Bans on High-Fatality Mass Shootings, 1990–2017

Louis Klarevas, PhD, Andrew Conner, BS, David Hemenway, PhD

Objectives. To evaluate the effect of large-capacity magazine (LCM) bans on the frequency and lethality of high-fatality mass shootings in the United States.

Methods. We analyzed state panel data of high-fatality mass shootings from 1990 to 2017. We first assessed the relationship between LCM bans overall, and then federal and state bans separately, on (1) the occurrence of high-fatality mass shootings (logit regression) and (2) the deaths resulting from such incidents (negative binomial analysis). We controlled for 10 independent variables, used state fixed effects with a continuous variable for year, and accounted for clustering.

Results. Between 1990 and 2017, there were 69 high-fatality mass shootings. Attacks involving LCMs resulted in a 62% higher mean average death toll. The incidence of high-fatality mass shootings in non–LCM ban states was more than double the rate in LCM ban states; the annual number of deaths was more than 3 times higher. In multivariate analyses, states without an LCM ban experienced significantly more high-fatality mass shootings and a higher death rate from such incidents.

Conclusions. LCM bans appear to reduce both the incidence of, and number of people killed in, high-fatality mass shootings. (*Am J Public Health.* 2019;109:1754–1761. doi: 10.2105/AJPH.2019.305311)

The recent spate of gun massacres in the United States has re-energized the debate over how to prevent such tragedies.[1] A common response to high-profile acts of gun violence is the promotion of tighter gun legislation, and there is some evidence that laws imposing tighter restrictions on access to firearms have been associated with lower levels of mass shootings.[2] One proposal that has received renewed interest involves restricting the possession of large-capacity magazines (LCMs).[3–5] This raises an important question: what has been the impact of LCM bans on high-fatality mass shootings?

In an attempt to arrest an uptick in mass shooting violence in the early 1990s, Congress in 1994 enacted the federal assault weapons ban, which, among other things, restricted ownership of certain ammunition-feeding devices.[6,7] The law, which contained a sunset provision, was allowed to expire a decade later. Pursuant to that ban (18 USC §921(a) [1994]; repealed), it was illegal to possess LCMs—defined as any ammunition-feeding device holding more than 10 bullets—unless the magazines were manufactured before the enactment of the ban. LCM restrictions are arguably the most important component of assault weapons bans because they also apply to semiautomatic firearms without military-style features.[8,9]

Beginning with New Jersey in 1990, some states implemented their own regulations on LCMs. Today, 9 states and the District of Columbia restrict the possession of LCMs. The bans vary along many dimensions, including maximum bullet capacity of permissible magazines, grandfathering of existing LCMs, and applicable firearms. Moreover, overlaps sometimes exist between assault weapons bans and LCM bans, but not in all states. For example, California instituted a ban on assault weapons in 1989, but LCMs remained unregulated in the state until 1994, when the federal ban went into effect. In 2000, California's own statewide ban on LCMs took effect as a safeguard in the event the federal ban expired, which happened in 2004.[10,11]

LCMs provide a distinct advantage to active shooters intent on murdering numerous people: they increase the number of rounds that can be fired at potential victims before having to pause to reload or switch weapons. Evidence shows that victims struck by multiple rounds are more likely to die, with 2 studies finding that, when compared with the fatality rates of gunshot wound victims who were hit by only a single bullet, the fatality rates of those victims hit by more than 1 bullet were more than 60% higher.[12,13] Being able to strike human targets with more than 1 bullet increases shooters' chances of killing their victims. Analyses of gunshot wound victims at level I trauma centers have suggested that this multiple-impact capability is often attributable to the use of LCMs.[14,15]

In addition, LCMs provide active shooters with extended cover.[16] During an attack, perpetrators are either firing their guns or not firing their guns. While gunmen are firing, it is extremely difficult for those in the line of fire to take successful defensive maneuvers. But if gunmen run out of bullets, there are lulls in the shootings, as the perpetrators are forced to pause their attacks to reload or change weapons. These pauses provide opportunities for people to intervene and disrupt a shooting. Alternatively, they provide individuals in

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harm's way with a chance to flee or hide. Legislative endeavors that restrict access to LCMs are implemented with the express objective of reducing an active shooter's multiple-impact capability and extended cover.[10]

Although mass shootings have received extensive study, there has been little scholarly analysis of LCM bans.[17–24] The studies undertaken that have broached the subject of ammunition capacity have primarily concentrated on the effect of LCM bans on violent crimes other than mass shootings or on the impact of the assault weapons bans on mass shootings.[25–27]

Evidence suggests that firearms equipped with LCMs are involved in a disproportionate share of mass shootings.[10,20,28] Proponents of LCM bans believe that without LCMs, fewer people will be killed in a mass shooting, other things equal. In turn, fewer shootings will cross the threshold required to be classified as what we call a "high-fatality mass shooting" (≥ 6 victims shot to death). If LCM bans are effective, we should expect to find that high-fatality mass shootings occur at a lower incidence rate when LCM bans are in place, and fewer people are killed in such attacks. But have LCM bans actually saved lives in practice? To our knowledge, the impact of LCM bans has never been systematically assessed. This study fills that void.

METHODS

Mass shootings have been defined in a variety of ways, with some analyses setting the casualty threshold as low as 2 people wounded or killed and others requiring a minimum of 7 gunshot victims.[18,22,29] We focused on high-fatality mass shootings—the deadliest and most disturbing of such incidents—which are defined as intentional crimes of gun violence with 6 or more victims shot to death, not including the perpetrators.[20,30,31] After an exhaustive search, we identified 69 such incidents in the United States between 1990 and 2017. We then discerned whether each high-fatality mass shooting involved a LCM—unless otherwise stated, defined consistent with the 1994 federal ban as a detachable ammunition-feeding device capable of holding more than 10 bullets. (See Table 1 for a list of incidents and for additional details on the search and identification strategy we employed.)

The first state to enact an LCM ban was New Jersey in 1990. Since then, another 8 states and the District of Columbia have enacted LCM bans (Table A, available as a supplement to the online version of this article at http://www.ajph.org).[10] With no LCM bans in effect before 1990, a priori we chose that year to begin our analysis to avoid inflating the impact of the bans. Our data set extends 28 years, from 1990 through 2017. As a secondary analysis, we used a 13-year data set, beginning in 2005, the first full year after the federal assault weapons ban expired.

Our primary outcome measures were the incidence of high-fatality mass shootings and the number of victims killed. We distinguished between high-fatality mass shootings occurring with and without a ban in effect. Because the federal ban was in effect nationwide from September 13, 1994, through September 12, 2004, we coded every state as being under an LCM ban during that 10-year timeframe.

Our interest was in the effect of LCM bans. We ran regression analyses to determine if any relationship between LCM bans and high-fatality mass shootings can be explained by other factors. In our state–year panel multivariate analyses, the outcome variables were (1) whether an LCM-involved high-fatality mass shooting occurred, (2) whether any high-fatality mass shooting occurred, (3) the number of fatalities in an LCM-involved high-fatality mass shooting, and (4) the number of fatalities in any high-fatality mass shooting. Our analyses first combined and then separated federal and state LCM bans.

Consistent with the suggestions and practices of the literature on firearm homicides and mass shootings, our explanatory variables are population density; proportion of population aged 19 to 24 years, aged 25 to 34 years, that is Black, and with a college degree; real per-capita median income; unemployment rate; and per-capita prison population.[2,26,27,32] We also added a variable for percentage of households with a firearm. All regression models controlled for total state population. When the dependent variable reflected occurrences of incidents (ordered choice data), we used logit regression; we ran probit regression as a sensitivity analysis. We had multiple observations for individual states. To control for this, we utilized cluster-robust standard errors to account for the clustering of observations. When the dependent variable reflected deaths (count data), we used negative binomial regression; Gius used a Poisson regression, and we used that approach as a sensitivity analysis.[26] We included state fixed effects. We used a continuous variable for year because the rate of high-fatality mass shootings has increased over time. For purposes of sensitivity analysis, we also replaced the linear yearly trend with a quadratic function. We performed multivariate statistical analyses by using Stata/IC version 15.1 (StataCorp LP, College Station, TX).

Population data came from the US Census Bureau, unemployment data came from the Bureau of Labor Statistics, and imprisonment data came from the Bureau of Justice Statistics. The percentage of households with a firearm was a validated proxy (the percentage of suicides that are firearm suicides) derived from Centers for Disease Control and Prevention National Vital Statistics Data.[33]

RESULTS

Between 1990 and 2017, there were 69 high-fatality mass shootings (≥ 6 victims shot to death) in the United States. Of these, 44 (64%) involved LCMs, 16 did not (23%), and for 9 (13%) we could not determine whether LCMs were used (Table 1). The mean number of victims killed in the 44 LCM-involved high-fatality mass shootings was 11.8; including the unknowns resulted in that average falling to 11.0 (not shown). The mean number of victims killed in high-fatality mass shootings in which the perpetrator did not use an LCM was 7.3 (Table B, available as a supplement to the online version of this article at http://www.ajph.org); including the unknowns resulted in that average falling to 7.1 (not shown). When we excluded unknown cases, the data indicated that utilizing LCMs in high-fatality mass shootings resulted in a 62% increase in the mean death toll.

Data sets of mass shooting fatalities by their nature involve truncated data, with the mode generally being the baseline number of fatalities required to be included in the data set (6 fatalities in the current study). Our data

TABLE 1—High-Fatality Mass Shootings in the United States, 1990–2017

Incident	Date	City	State	LCM	Deaths, No.	State LCM Ban	Federal Assault Weapons Ban
1	Jun 18, 1990	Jacksonville	FL	Y	9	N	N
2	Jan 26, 1991	Chimayo	NM	N	7	N	N
3	Aug 9, 1991	Waddell	AZ	N	9	N	N
4	Oct 16, 1991	Killeen	TX	Y	23	N	N
5	Nov 7, 1992	Morro Bay and Paso Robles	CA	N	6	N	N
6	Jan 8, 1993	Palatine	IL	N	7	N	N
7	May 16, 1993	Fresno	CA	Y	7	N	N
8	Jul 1, 1993	San Francisco	CA	Y	8	N	N
9	Dec 7, 1993	Garden City	NY	Y	6	N	N
10	Apr 20, 1999	Littleton	CO	Y	13	Y	Y
11	Jul 12, 1999	Atlanta	GA	U	6	Y	Y
12	Jul 29, 1999	Atlanta	GA	Y	9	Y	Y
13	Sep 15, 1999	Fort Worth	TX	Y	7	Y	Y
14	Nov 2, 1999	Honolulu	HI	Y	7	Y	Y
15	Dec 26, 2000	Wakefield	MA	Y	7	Y	Y
16	Dec 28, 2000	Philadelphia	PA	Y	7	Y	Y
17	Aug 26, 2002	Rutledge	AL	N	6	Y	Y
18	Jan 15, 2003	Edinburg	TX	U	6	Y	Y
19	Jul 8, 2003	Meridian	MS	N	6	Y	Y
20	Aug 27, 2003	Chicago	IL	N	6	Y	Y
21	Mar 12, 2004	Fresno	CA	N	9	Y	Y
22	Nov 21, 2004	Birchwood	WI	Y	6	N	N
23	Mar 12, 2005	Brookfield	WI	Y	7	N	N
24	Mar 21, 2005	Red Lake	MN	Y	9	N	N
25	Jan 30, 2006	Goleta	CA	Y	7	Y	N
26	Mar 25, 2006	Seattle	WA	Y	6	N	N
27	Jun 1, 2006	Indianapolis	IN	Y	7	N	N
28	Dec 16, 2006	Kansas City	KS	N	6	N	N
29	Apr 16, 2007	Blacksburg	VA	Y	32	N	N
30	Oct 7, 2007	Crandon	WI	Y	6	N	N
31	Dec 5, 2007	Omaha	NE	Y	8	N	N
32	Dec 24, 2007	Carnation	WA	U	6	N	N
33	Feb 7, 2008	Kirkwood	MO	Y	6	N	N
34	Sep 2, 2008	Alger	WA	U	6	N	N
35	Dec 24, 2008	Covina	CA	Y	8	Y	N
36	Jan 27, 2009	Los Angeles	CA	N	6	Y	N
37	Mar 10, 2009	Kinston, Samson, and Geneva	AL	Y	10	N	N
38	Mar 29, 2009	Carthage	NC	N	8	N	N
39	Apr 3, 2009	Binghamton	NY	Y	13	Y	N
40	Nov 5, 2009	Fort Hood	TX	Y	13	N	N
41	Jan 19, 2010	Appomattox	VA	Y	8	N	N

Continued

TABLE 1—*Continued*

Incident	Date	City	State	LCM	Deaths, No.	State LCM Ban	Federal Assault Weapons Ban
42	Aug 3, 2010	Manchester	CT	Y	8	N	N
43	Jan 8, 2011	Tucson	AZ	Y	6	N	N
44	Jul 7, 2011	Grand Rapids	MI	Y	7	N	N
45	Aug 7, 2011	Copley Township	OH	N	7	N	N
46	Oct 12, 2011	Seal Beach	CA	N	8	Y	N
47	Dec 25, 2011	Grapevine	TX	N	6	N	N
48	Apr 2, 2012	Oakland	CA	N	7	Y	N
49	Jul 20, 2012	Aurora	CO	Y	12	N	N
50	Aug 5, 2012	Oak Creek	WI	Y	6	N	N
51	Sep 27, 2012	Minneapolis	MN	Y	6	N	N
52	Dec 14, 2012	Newtown	CT	Y	27	N	N
53	Jul 26, 2013	Hialeah	FL	Y	6	N	N
54	Sep 16, 2013	Washington	DC	N	12	Y	N
55	Jul 9, 2014	Spring	TX	Y	6	N	N
56	Sep 18, 2014	Bell	FL	U	7	N	N
57	Feb 26, 2015	Tyrone	MO	U	7	N	N
58	May 17, 2015	Waco	TX	Y	9	N	N
59	Jun 17, 2015	Charleston	SC	Y	9	N	N
60	Aug 8, 2015	Houston	TX	U	8	N	N
61	Oct 1, 2015	Roseburg	OR	Y	9	N	N
62	Dec 2, 2015	San Bernardino	CA	Y	14	Y	N
63	Feb 21, 2016	Kalamazoo	MI	Y	6	N	N
64	Apr 22, 2016	Piketon	OH	U	8	N	N
65	Jun 12, 2016	Orlando	FL	Y	49	N	N
66	May 27, 2017	Brookhaven	MS	U	8	N	N
67	Sep 10, 2017	Plano	TX	Y	8	N	N
68	Oct 1, 2017	Las Vegas	NV	Y	58	N	N
69	Nov 5, 2017	Sutherland Springs	TX	Y	25	N	N

Note. LCM = large-capacity magazine; N = no; U = unknown; Y = yes. From September 13, 1994, until and including September 12, 2004, each and every state, including the District of Columbia, was subject to a ban on LCMs pursuant to the federal assault weapons ban. To collect the data in Table 1, we searched the following news media resources for every shooting that resulted in 6 or more fatalities: America's Historical Newspapers, EBSCO, Factiva, Gannett Newsstand, Google News Archive, Lexis-Nexis, Newspaper Archive, Newspaper Source Plus, Newspapers.com, Newswires, ProQuest Historical Newspapers, and ProQuest Newsstand. We also reviewed mass shooting data sets maintained by *Mother Jones*, the *New York Times*, and *USA Today*. In addition to news media sources, we reviewed reports on mass shootings produced by think tank, policy advocacy, and governmental organizations, including the US Federal Bureau of Investigation Supplementary Homicide Reports, the crowdsourced Mass Shooting Tracker, and the open-source databases maintained by the Gun Violence Archive and the Stanford University Geospatial Center. Finally, when it was relevant, we also reviewed court records as well as police, forensic, and autopsy reports. As a general rule, when government sources were available, they were preferred over other sources. Furthermore, when media sources conflicted on the number of casualties or the weaponry involved, the later sources were privileged (as later reporting is often more accurate).

set of high-fatality mass shootings was no exception. As such, the median average number of fatalities for each subset of incidents—those involving and those not involving LCMs—was necessarily lower than the mean average. Nevertheless, like the mean average, the median average was higher when LCMs were employed—a median average of 8 fatalities per incident compared with 7 fatalities per incident for attacks not involving LCMs.

For the 60 incidents in which it was known if an LCM was used, in 44 the perpetrator used an LCM. Of the 44 incidents in which the perpetrators used LCMs, 77% (34/44) were in nonban states. In the 16 incidents in which the perpetrators did not use LCMs, 50% (8/16) were in nonban states (Table B, available as a supplement to the online version of this article at http://www.ajph.org). Stated differently, in nonban states, 81% (34/42) of high-fatality mass shooting perpetrators used LCMs; in LCM-ban states, only 55% (10/18) used LCMs.

The rate of high-fatality mass shootings increased considerably after September 2004 (when the federal assault weapons ban expired). In the 10 years the federal ban was in effect, there were 12 high-fatality mass shootings and 89 deaths (an average of 1.2 incidents and 8.9 deaths per year). Since then, through 2017, there have been 48 high-fatality mass shootings and 527 deaths (an average of 3.6 incidents and 39.6 deaths per year in these 13.3 years).

Of the 69 high-fatality mass shootings from 1990 to 2017, 49 occurred in states without an LCM ban in effect at the time and 20 in states with a ban in effect at the time. The annual incidence rate for high-fatality mass shootings in states without an LCM ban was 11.7 per billion population; the annual incidence rate for high-fatality mass shootings in states with an LCM ban was 5.1 per billion population. In that 28-year period, the rate of high-fatality mass shootings per capita was 2.3 times higher in states without an LCM ban (Table 2).

Non–LCM ban states had not only more incidents but also more deaths per incident (10.9 vs 8.2). The average annual number of high-fatality mass shooting deaths per billion population in the non–LCM ban states was 127.4. In the LCM ban states, it was 41.6 (Table 2).

For the time period beginning with the first full calendar year following the expiration of the federal assault weapons ban (January 1, 2005–December 31, 2017), there were 47 high-fatality mass shootings in the United States. Of these, 39 occurred in states where an LCM ban was not in effect, and 8 occurred in LCM ban locations. The annual incidence rate for high-fatality mass shootings in states without an LCM ban was 13.2 per billion population; for states with an LCM ban, it was 7.4 per billion population (Table 2). During this period, non–LCM ban states had not only more incidents but also more deaths per incident (11.4 vs 9.4). In terms of high-fatality mass shooting deaths per billion population, the annual number of deaths in the non-LCM ban states was 150.6; in the LCM ban states it was 69.2 (Table 2).

When we limited the analysis solely to high-fatality mass shootings that definitely involved LCMs, the differences between ban and nonban states became larger. For example, for the entire period of 1990 to 2017, of the 44 high-fatality mass shootings that involved LCMs, the annual incidence rate for LCM-involved high-fatality mass shootings in nonban states was 8.1 per billion population; in LCM-ban states it was 2.5 per billion population. The annual rate of high-fatality mass shooting deaths in the non–LCM ban states was 102.1 per billion population; in the LCM ban states it was 23.3. In terms of LCM-involved high-fatality mass shootings, we also found comparable wide differences in incidence and fatality rates between ban and nonban states for the post–federal assault weapons ban period (2005–2017; Table 2).

We found largely similar results in the multivariate analyses (1990–2017). States that did not ban LCMs were significantly more likely to experience LCM-involved high-fatality mass shootings as well as more likely to experience any high-fatality mass shootings (regardless of whether an LCM was involved). States that did not ban LCMs also experienced significantly more deaths from high-fatality mass shootings, operationalized as the absolute number of fatalities (Table 3).

When the LCM bans were separated into federal and state bans, both remained significantly related to the incidence of LCM-involved high-fatality mass shooting events and to the number of LCM-involved high-fatality mass shooting deaths. The associations between federal and state bans and

TABLE 2—High-Fatality Mass Shootings (≥6 Victims Shot to Death) by Whether LCM Bans Were in Effect: United States, 1990–2017

	Average Annual Population, No. (Millions)	Total Incidents, No.	Annual Incidents per Billion Population, No.	Total Deaths, No.	Annual Deaths per Billion Population, No.	Deaths per Incident, No.
All high-fatality mass shootings, 1990–2017 (28 y)						
Non–LCM ban states	149.7	49	11.7	534	127.4	10.9
LCM ban states	140.7	20	5.1	164	41.6	8.2
All high-fatality mass shootings, 2005–2017 (13 y)						
Non–LCM ban states	227.8	39	13.2	446	150.6	11.4
LCM ban states	83.4	8	7.4	75	69.2	9.4
LCM-involved high-fatality mass shootings, 1990–2017 (28 y)						
Non–LCM ban states	149.7	34	8.1	428	102.1	12.6
LCM ban states	140.7	10	2.5	92	23.3	9.2
LCM-involved high-fatality mass shootings, 2005–2017 (13 y)						
Non–LCM ban states	227.8	28	9.5	369	124.6	13.2
LCM ban states	83.4	4	3.7	42	38.7	10.5
Non-LCM high-fatality mass shootings, 1990–2017 (28 y)						
Non–LCM ban states	149.7	8	1.9	56	13.4	7.0
LCM ban states	140.7	8	2.0	60	15.2	7.5

Note. LCM = large-capacity magazine.

TABLE 3—Multivariate Results of the Relationship Between LCM Bans and High-Fatality Mass Shootings (≥ 6 Victims Shot to Death), 1990–2017 Combined Federal and State Large Capacity Magazine Bans: United States

	LCM-Involved High-Fatality Mass Shootings, b (95% CI)		All High-Fatality Mass Shootings, b (95% CI)	
	Incidents[a]	No. Deaths[b]	Incidents[a]	No. Deaths[b]
All LCM bans (federal and state)	−2.217 (−3.493, −0.940)	−5.912 (−9.261, −2.563)	−1.283 (−2.147, −0.420)	−3.660 (−5.695, −1.624)
Population density	−0.011 (−0.052, 0.031)	0.013 (−0.068, 0.095)	0.001 (−0.003, 0.006)	0.011 (−0.005, 0.026)
% aged 19–24 y	−0.480 (−1.689, 0.730)	−2.496 (−5.893, 0.901)	0.283 (−0.599, 1.164)	−0.585 (−2.666, 1.495)
% aged 25–34 y	−0.801 (−1.512, −0.089)	−2.390 (−4.391, −0.388)	−0.337 (−0.871, 0.197)	−1.114 (−2.463, 0.235)
% Black	−0.227 (−1.062, 0.607)	−0.654 (−2.831, 1.522)	−0.163 (−0.703, 0.377)	−0.261 (−1.391, 0.870)
% with a bachelor's degree or higher	−0.009 (−0.492, 0.474)	−0.469 (−1.590, 0.652)	0.143 (−0.214, 0.501)	0.183 (−0.715, 1.081)
Percentage of households with a firearm (proxy)	−0.047 (−0.195, 0.101)	−0.147 (−0.546, 0.251)	−0.020 (−0.131, 0.091)	−0.084 (−0.368, 0.200)
Median household income	0.000 (0.000, 0.000)	0.000 (0.000, 0.000)	0.000 (0.000, 0.000)	0.000 (0.000, 0.000)
Unemployment rate	−0.072 (−0.293, 0.149)	−0.476 (−1.081, 0.129)	0.041 (−0.135, 0.216)	−0.182 (−0.628, 0.263)
Imprisonment rate (per 100 000 population)	−0.006 (−0.012, 0.001)	−0.007 (−0.017, 0.004)	−0.001 (−0.006, 0.003)	−0.003 (−0.012, 0.007)
Total population	0.000 (0.000, 0.000)	0.000 (0.000, 0.000)	0.000 (0.000, 0.000)	0.000 (0.000, 0.000)
Pseudo R^2	0.31	0.16	0.26	0.11

Note. CI = confidence interval; LCM = large-capacity magazine. There were a total of 1428 observations in state-years (51 jurisdictions—all 50 states plus Washington, DC—over a 28-year period). Mean variance inflation factor = 3.49.

[a]Logit regression.

[b]Negative binomial regression.

the overall incidence of all high-fatality mass shootings as well as the total number of victims in these events remained strongly negative but was only sometimes statistically significant (Table 4).

In terms of sensitivity analyses, using probit instead of logit gave us similar results (not shown). When the outcome variable was the number of high-fatality mass shooting deaths, we obtained largely similar results concerning the association between LCM bans and the outcome variables, regardless of whether we used Poisson or negative binominal regression (not shown). Moreover, replacing the linear yearly trend with a quadratic function did not change the major results of the analyses (not shown). Variance inflation factors for all the independent variables never exceeded 10.0, with the variance inflation factor for LCM ban variables always being less than 2.0, indicating that there were no significant multicollinearity issues (Tables 3 and 4).

DISCUSSION

In the United States, LCMs are disproportionately used in high-fatality mass shootings (incidents in which ≥ 6 victims are shot to death). In at least 64% of the incidents since 1990, perpetrators used LCMs. (For 23%, we determined that they did not involve LCMs, and a determination could not be made for the remaining 13%.) Previous research has shown that LCM firearms are used in a high share of mass murders (typically defined as ≥ 4 homicides) and murders of police.[9]

We could not find reliable estimates of LCM firearms in the US gun stock. However, it is likely much lower than 64%, given that commonly owned firearms such as revolvers, bolt-action rifles, and shotguns are not typically designed to be LCM-capable. During the decade the federal assault weapons ban was in effect, no firearms were legally manufactured with LCMs for sale in the United States. In the postban era, semiautomatic firearms, especially pistols, are often sold with factory-issue LCMs, but firearms that are not semiautomatic are not sold with such magazines.

Why do we find LCMs so prominent among high-fatality mass shootings? We suspect there are 2 main reasons. The first is that perpetrators probably deliberately select LCMs because they facilitate the ability to fire many rounds without having to stop to reload. The second reason is that the ability of shooters to kill many victims—especially the 6 victims required to be included in our data set—may be reduced if LCMs are not available. In other words, the first explanation is that shooters perceive LCMs to be more effective at killing many people; the second explanation is that LCMs are indeed more effective at killing many people.

High-fatality mass shootings are not common, even in the United States. Between 1990 and 2017, there has been an average of 2.5 incidents per year, with an average of 25 people killed annually in such attacks. However, the number of incidents and the number of people killed per incident have been increasing since the end of the federal assault weapons ban.

In our study, we found that bans on LCMs were associated with both lower incidence of high-fatality mass shootings and lower fatality tolls per incident. The difference in incidence and overall number of fatalities between states, with and without bans, was even greater for LCM-involved high-fatality mass shootings.

The multivariate results are largely consistent with these bivariate associations. When we controlled for 10 independent variables often associated with overall crime rates, as well as state and year effects, states with LCM bans had lower rates of high-fatality mass shootings and fewer high-fatality mass shooting deaths. When we investigated federal and state bans separately in the multiple

TABLE 4—Multivariate Results of the Relationship Between Large Caliber Magazine Bans and High-Fatality Mass Shootings (≥ 6 Victims Shot to Death), 1990–2017 Separate Federal and State Large Caliber Magazine Bans: United States

	LCM-Involved High-Fatality Mass Shootings, b (95% CI)		All High-Fatality Mass Shootings, b (95% CI)	
	Incidents[a]	No. Deaths[b]	Incidents[a]	No. Deaths[b]
Federal LCM ban	−1.434 (−2.622, −0.245)	−3.571 (−7.103, −0.038)	−0.895 (−1.806, 0.016)	−2.570 (−4.902, −0.238)
State LCM bans	−2.603 (−4.895, −0.311)	−8.048 (−15.172, −0.925)	−1.277 (−2.977, 0.422)	−3.082 (−7.227, 1.064)
Population density	−0.012 (−0.055, 0.030)	−0.001 (−0.085, 0.083)	0.001 (−0.003, 0.006)	0.009 (−0.007, 0.024)
% aged 19–24 y	−0.311 (−1.499, 0.878)	−2.589 (−6.057, 0.879)	0.342 (−0.551, 1.236)	−0.531 (−2.759, 1.698)
% aged 25–34 y	−0.812 (−1.532, −0.093)	−2.660 (−4.848, −0.471)	−0.323 (−0.864, 0.217)	−0.848 (−2.236, 0.539)
% Black	−0.229 (−1.101, 0.643)	−0.770 (−3.232, 1.693)	−0.150 (−0.698, 0.398)	−0.154 (−1.321, 1.013)
% with a bachelor's degree or higher	−0.031 (−0.447, 0.509)	−0.479 (−1.577, 0.618)	0.156 (−0.199, 0.511)	0.269 (−0.567, 1.106)
Percentage of households with a firearm (proxy)	−0.055 (−0.210, 0.101)	−0.227 (−0.651, 0.196)	−0.019 (−0.133, 0.094)	−0.107 (−0.399, 0.186)
Median household income	0.000 (0.000, 0.000)	0.000 (0.000, 0.000)	0.000 (0.000, 0.000)	0.000 (0.000, 0.000)
Unemployment rate	−0.061 (−0.284, 0.162)	−0.420 (−1.041, 0.201)	0.046 (−0.132, 0.224)	−0.157 (−0.619, 0.305)
Imprisonment rate (per 100 000 population)	−0.006 (−0.013, 0.000)	−0.012 (−0.026, 0.002)	−0.002 (−0.007, 0.003)	−0.003 (−0.014, 0.007)
Total population	0.000 (0.000, 0.000)	0.000 (0.000, 0.000)	0.000 (0.000, 0.000)	0.000 (0.000, 0.000)
Pseudo R^2	0.30	0.15	0.26	0.11

Note. CI = confidence interval; LCM = large-capacity magazine. There were a total of 1428 observations in state-years (51 jurisdictions—all 50 states plus Washington, DC—over a 28-year period). Mean variance inflation factor = 3.45.

[a]Logit regression.

[b]Negative binomial regression.

regressions, both were significantly associated with the incidence of LCM-involved high-fatality mass shootings as well as the number of victims in LCM-involved attacks. The relationship between these bans, considered separately, and all high-fatality mass shooting incidence and deaths is often not statistically significant, although this may be attributable to lack of statistical power (number of observations) to find a statistically significant effect.

Our analysis provides answers to 4 important questions:

1. How often are LCMs used in high-fatality mass shootings? At minimum, 64% of high-fatality mass shootings perpetrated between 1990 and 2017 involved LCMs.
2. Are more people killed when LCMs are used? Yes, and the difference in our data set is substantial and statistically significant (11.8 vs 7.3). We should add that our results likely underestimate the difference because we have a truncated sample (we only examined incidents with at least 6 victim fatalities), compounded by the fact that the number of homicide incidents fell as the number of victims increased.
3. Do states with LCM bans experience high-fatality mass shootings involving LCMs at a lower rate and a lower fatality count than those states with no such bans in effect? Yes. In fact, the effect is more pronounced for high-fatality mass shootings involving LCMs than for those not involving LCMs.
4. Do states with LCM bans experience high-fatality mass shootings (regardless of whether they involve LCMs) at a lower rate and a lower fatality count than states with no such bans in effect? Yes.

Limitations

Our study had various limitations. First, although we carefully searched for every high-fatality mass shooting, it is possible that we might have missed some. Nevertheless, we suspect that this is unlikely, because it would mean that others who compiled lists have also missed the same ones, for we checked our list against multiple sources.

Second, our definition of a high-fatality mass shooting is a shooting that results in 6 or more fatal victims. A different threshold criterion (e.g., 6 or more people shot; 5 or more victims killed), might lead to somewhat different results. We expect that as the number of victims in a shooting increases, the likelihood that the perpetrator used an LCM also increases. Indeed, of the 13 high-fatality mass shootings with 10 or more fatalities in our data set, 12 (92%) involved an LCM.

Third, although many high-fatality mass shootings tend to be highly publicized, in 13% of the incidents we reviewed, we could not determine whether an LCM was used. As a sensitivity analysis, we assessed the assumptions that all of the unknown cases first did, and then did not, involve LCMs. Neither assumption appreciably changed our main results (not shown).

Fourth, as a general rule, clustering standard errors is most appropriate when there is a large number of treated units. Although during the decade of the federal assault weapons bans all 50 states plus the District of Columbia regulated LCMs, during the remaining time periods under examination, only 8 jurisdictions regulated LCMs. As a result, there is the possibility that the standard errors were underestimated in our analyses.[34]

Fifth, there were only 69 events that met our criterion for a "high-fatality mass shooting." Although 69 is a horrific number of incidents, for statistical purposes, it is a relatively small number and limits the power to detect significant associations. For example, we did not have the statistical power (and thus did not even try) to determine whether

different aspects of the various LCM laws might have differential effects on the incidence of high-fatality mass shootings. Moreover, because of suboptimal statistical power, there is also the possibility that the magnitude of the effects detected was overestimated.[35]

Public Health Implications

LCMs increase the ability to fire large numbers of bullets without having to pause to reload. Any measure that can force a pause in an active shooting—creating opportunities for those in the line of fire to flee, take cover, or physically confront a gunman—offers a possibility of reducing the number of victims in such an attack. To put it in different terms, if the only firearms available were 18th-century muskets, it is doubtful that mass shootings would be the social problem they are today.

The impact of individual state firearm laws is reduced by the fact that guns often move across state lines—occasionally purchased in locales with more permissive laws and taken to states with more restrictive laws. This is partly why efforts aimed at reducing the frequency and lethality of mass shootings must necessarily be multifaceted and multidisciplinary. Legal restrictions on firearms are merely a part of this broader, public health approach. That being said, the theory behind reducing the availability of LCMs to reduce the number of victims in mass shootings makes sense, and our empirical results, consistent with much of the limited literature on mass shootings, suggest that LCM bans have been effective in saving lives. AJPH

CONTRIBUTORS

L. Klarevas and D. Hemenway designed the study, collected the data, and contributed equally to all parts of the study. A. Conner ran the statistical analyses and helped construct the tables that report the results of the multivariate analyses. All authors approved the final article as submitted.

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CONFLICTS OF INTEREST

L. Klarevas has, in the past 2 years, served as an expert to the states of Colorado and California in civil litigation that involved the constitutionality of state restrictions on large-capacity magazines. The authors have no additional conflicts of interest to report.

HUMAN PARTICIPANT PROTECTION

No protocol approval was needed because no human participants were involved in this study.

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Exhibit

Changes in US mass shooting deaths associated with the 1994–2004 federal assault weapons ban: Analysis of open-source data

Charles DiMaggio, PhD, MPH, Jacob Avraham, MD, Cherisse Berry, MD, Marko Bukur, MD, Justin Feldman, ScD, Michael Klein, MD, Noor Shah, MD, Manish Tandon, MD, *and* **Spiros Frangos, MD, MPH***, New York, New York*

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BACKGROUND: A federal assault weapons ban has been proposed as a way to reduce mass shootings in the United States. The Federal Assault Weapons Ban of 1994 made the manufacture and civilian use of a defined set of automatic and semiautomatic weapons and large capacity magazines illegal. The ban expired in 2004. The period from 1994 to 2004 serves as a single-arm pre-post observational study to assess the effectiveness of this policy intervention.

METHODS: Mass shooting data for 1981 to 2017 were obtained from three well-documented, referenced, and open-source sets of data, based on media reports. We calculated the yearly rates of mass shooting fatalities as a proportion of total firearm homicide deaths and per US population. We compared the 1994 to 2004 federal ban period to non-ban periods, using simple linear regression models for rates and a Poison model for counts with a year variable to control for trend. The relative effects of the ban period were estimated with odds ratios.

RESULTS: Assault rifles accounted for 430 or 85.8% of the total 501 mass-shooting fatalities reported (95% confidence interval, 82.8–88.9) in 44 mass-shooting incidents. Mass shootings in the United States accounted for an increasing proportion of all firearm-related homicides (coefficient for year, 0.7; $p = 0.0003$), with increment in year alone capturing over a third of the overall variance in the data (adjusted $R^2 = 0.3$). In a linear regression model controlling for yearly trend, the federal ban period was associated with a statistically significant 9 fewer mass shooting related deaths per 10,000 firearm homicides ($p = 0.03$). Mass-shooting fatalities were 70% less likely to occur during the federal ban period (relative rate, 0.30; 95% confidence interval, 0.22–0.39).

CONCLUSION: Mass-shooting related homicides in the United States were reduced during the years of the federal assault weapons ban of 1994 to 2004. (*J Trauma Acute Care Surg.* 2019;86: 11–19. Copyright © 2018 American Association for the Surgery of Trauma.)

LEVEL OF EVIDENCE: Observational, level II/IV.

KEY WORDS: Firearms; mass-shootings; assault weapons; epidemiology.

Increases in firearm-related injuries, particularly mass-shooting related fatalities, in the United States have contributed to a polarizing and sometimes contentious debate over gun ownership and limiting weapons characterized as assault weapons.[1,2] Despite the increasing sense that there is an epidemic of indiscriminate firearm violence in our schools and public spaces, there is a paucity of public health evidence on the topic. Among a number of recommendations, a federal Assault Weapons Ban (AWB) has been proposed as a way to prevent and control mass shootings in the United States. In this article, we assess evidence for the effectiveness of such a ban in preventing or controlling mass-shooting homicides in the United States.

While mass shootings occur in other industrialized nations, the United States is particularly prone to these crimes. In a recent 30-year period, the United States had double the number of mass-shooting incidents than the next 24 industrialized nations combined.[3] Any public perception of recent increases in the number of these events is borne out by analysis of available data.[4] By one measure, there have been more deaths due to mass shootings in the United States in the past 18 years than in the entire 20th century.[5] While there is some debate about the role of mental illness in mass shootings,[6–8] many high-profile recent mass shootings (Aurora, CO; Roseburg, OR; San Bernadino, CA; Newtown, CT; Orlando; Las Vegas; Sutherland Springs, TX) have been characterized by the use of semiautomatic assault rifles,[9] leading some to advocate for restrictions on the manufacture and sale of these weapons.

While survey results indicate that researchers in criminology, law and public health rank an assault weapons ban as one of the most effective measures to prevent mass shootings, and that 67% of the US general population support such a ban,[10] the existing evidence on banning assault weapons is scant and sometimes contradictory. Most evidence is related to the Federal AWB of 1994, which made illegal the manufacture and use by civilians of a defined set of automatic and semiautomatic weapons and large capacity magazines. Formally known as "The Public Safety and Recreational Firearms Use Protection Act", the AWB was part of the broader "Violent Crime Control and Law Enforcement Act of 1994. The ban lasted 10 years, expiring in 2004 when the US Congress declined to renew it.

In a study soon following the implementation of the 1994 ban, researchers reported a 55% decrease in the recovery of assault weapons by the Baltimore City Police in the first 6 months of 1995, indicating a statistically significant 29 fewer such firearms in the population.[11] In a 2009 study based on ICD9 external cause of injury codes for patients younger than 18 years in the United States, 11 states with assault and large-capacity magazine bans, as well as other firearm laws, were compared with 33 states without such restrictions. The incidence of firearm injuries per 1,000 total traumatic injuries was significantly lower in states with restrictive laws, 2.2 compared with 5.9.[12] In contrast, a comprehensive 2001 evaluation of the AWB itself concluded that there was "no evidence of reductions in multiple-victim gun homicides or multiple-gunshot wound victimizations". The authors cautioned their results should be "interpreted cautiously" because of the short period since the ban's inception, and that future assessments were warranted.[13] More recent studies, while not primarily addressing the US Federal AWB have found results generally consistent with its effectiveness in preventing mass-shooting fatalities.[14,15]

We believe sufficient time has passed and enough data have accumulated to treat the period from 1994 to 2004 as a naturalistic pre-post observational comparison period for the association of the AWB with changes in mass-shootings in the United States. Because there is no authoritative source or registry, or even a widely agreed upon definition for these incidents, we obtained data from three open source references and restricted our analyses to only those incidents confirmed by all three sources. We assess evidence for the potential effectiveness of such a ban in preventing and controlling mass-shooting homicides in the United States. We hypothesized that the implementation of the Federal AWB contributed to a reduction in mass shooting deaths as measured by the number and rate of mass shooting fatalities before, during, and after the federal AWB.

METHODS

Mass incident shooting data were obtained from three independent, well-documented and referenced online sources: Mother Jones Magazine, the Los Angeles Times and Stanford

University.[16–18] These sources have each been the basis for a number of previous studies.[19–26] Data from the three online open-source references were combined. Analyses were restricted to incidents reported by all three sources. Entries were further restricted to those for which four or more fatalities (not including the shooter) were reported, which meets the strictest definition of mass shootings as defined by the Federal Bureau of Investigation.[27,28] Yearly homicide data were obtained from the US Centers for Disease Control and Prevention Web-based Injury Statistics Query and Reporting System (WISQARS) an online database of fatal and nonfatal injury.[29] Because 2017 data were not yet available in the WISQARS system, data for firearm-related homicide data for that year were obtained from a separate online source.[30]

A variable was created to indicate the 1994 to 2004 period as the federal ban period. We attempted to identify incidents involving assault weapons. An assault weapon has been defined as semiautomatic rifle that incorporates military-style features such as pistol grips, folding stocks, and high-capacity detachable magazines.[31] In this study, assault weapons were identified using the text search terms "AK," "AR," "MCX," "assault," "assault," or "semiautomatic" in a text field for weapon details. These terms were based on descriptions of the federal assault ban legislative language.[32] The total number of mass shooting fatalities and injuries were aggregated by year and merged with the yearly firearm homicide data.

The rate of mass shooting fatalities per 10,000 firearm homicide deaths was calculated. For the years covered by the data sources, we calculated (1) the total and yearly number of mass-shooting incidents that met the strictest criteria and were confirmed by all three sources, (2) the number of all weapon (assault and nonassault weapons) mass-shooting fatalities, and (3) the case-fatality ratio of all-weapon mass-shooting fatalities per 100 total mass-shooting fatalities and injuries. The yearly case-fatality ratio was plotted with overlying Loess line for trend and standard error limits. We also plotted the yearly rate of mass shooting fatalities per 10,000 firearm-related homicides with an overlying simple linear model with year as the predictor for (1) the total period, and (2) for preban, ban, and postban periods.

We evaluated assumptions of normality and linearity of the data using graphical methods such as density plots and Q-Q normal plots as well as summary statistics. We tested the hypothesis that the federal ban period was associated with a decrease in the number and rate of mass-shooting fatalities in the United States with a multiple linear regression model, with total homicide-based mass-shooting fatality rate as the outcome variable, a dichotomous indicator variable for the federal ban period as the predictor variable, and year as a control variable for trend over time. We calculated the relative risk of mass shooting fatalities during the federal ban period compared to nonban periods by using the "epitab" function of the R "epitools" package. This estimate is based on the ratio of the fatality rate during the ban period divided by the fatality rate during the nonban period. All results are presented with two-sided p values with a significance level of 0.05 and/or 95% confidence intervals (CI). We conducted subgroup analysis with data restricted to incidents in which an assault-type weapon was explicitly noted.

We conducted analyses to test the sensitivity of our results to the choice of denominator with linear regression models controlling for trend with yearly rates based on (1) CDC WISQARS homicide data ending in 2016, (2) extrapolated CDC WISQARS homicide data for 2017, and (3) population denominator-based rates. We tested the robustness of our underlying modeling assumptions with an alternate mixed-effects generalized linear model of yearly mass shooting fatality counts with an observation-level random effect to account for overdispersion.

The study was determined to be exempt as nonidentifiable data. The study data and analytic code are available for download at http://www.injuryepi.org/styled-2/.

RESULTS

The three data sources listed incidents ranging in number from 51 (LA Times) to 335 (Stanford) and in dates from 1966 (Stanford) to 2018 (LA Times). There were a total of 51 reported cases of mass shootings between 1981 and 2017 confirmed by all three sources. Forty-four of these incidents met the strictest criteria for mass shootings (4 or more killed), totaling 501 all-weapon fatalities. In total 1,460 persons were injured or killed over the 37-year period, for a total case-fatality ratio of 34.3% (95% CI, 31.9–36.8). The overall rate of mass shooting fatalities per 10,000 firearm-related homicides was 10.2 (95% CI, 9.4–11.2). There was an increase in the all-weapon yearly number of mass-shooting fatalities in the United States during the study period, (Fig. 1) and evidence of a decrease in case fatality in the post-2010 period (Fig. 2). Incidents in which weapons were characterized as assault rifles accounted for 430 or 85.8% of mass-shooting fatalities (95% CI, 82.8–88.9). Weapons characterized as assault rifles accounted for *all* mass-shooting fatalities in 15 (62.5%) of the 24 (95% CI, 42.6–78.9) years for which a mass-shooting incident was reported, accounting for a total of 230 fatalities in those years.

Between 1981 and 2017, mass shootings in the United States accounted for an increasing proportion of all firearm-related homicides, with increment in year accounting for nearly 32% of the overall variance in the data. During the years in which the AWB was in effect, this slope decreased, with an increase in the slope of yearly mass-shooting homicides in the postban period

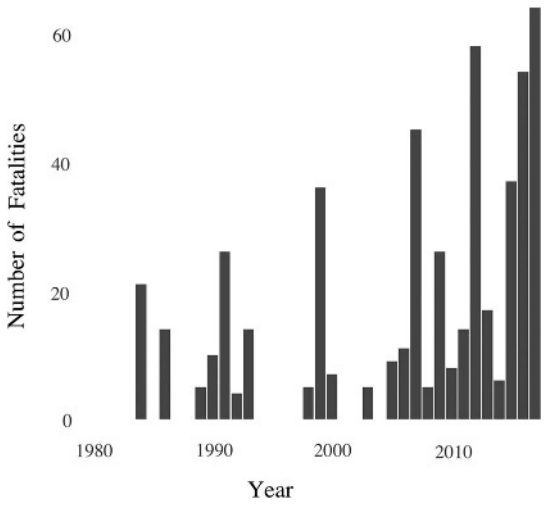

Figure 1. Mass shooting deaths. United States 1981–2017.

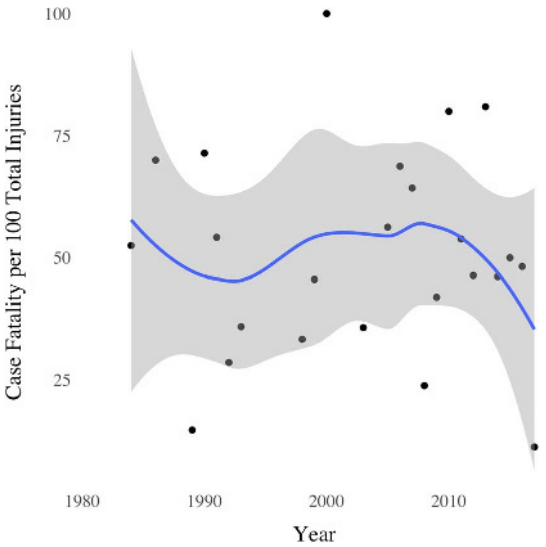

Figure 2. Case fatality per 100 total mass-shooting injuries with loess smoothing line for trend and standard error bounds. United States 1981–2017.

(Fig. 3). A similar pattern was evident in data restricted to those incidents characterized as involving assault weapons (Fig. 4).

In a linear regression model controlling for yearly trend, the federal ban period was associated with a statistically significant 9 fewer mass shooting–related deaths per 10,000 firearm homicides per year (Table 1). The model indicated that year and federal ban period alone accounted for nearly 40% of all the variation in the data (adjusted R^2 = 0.37). A subanalysis

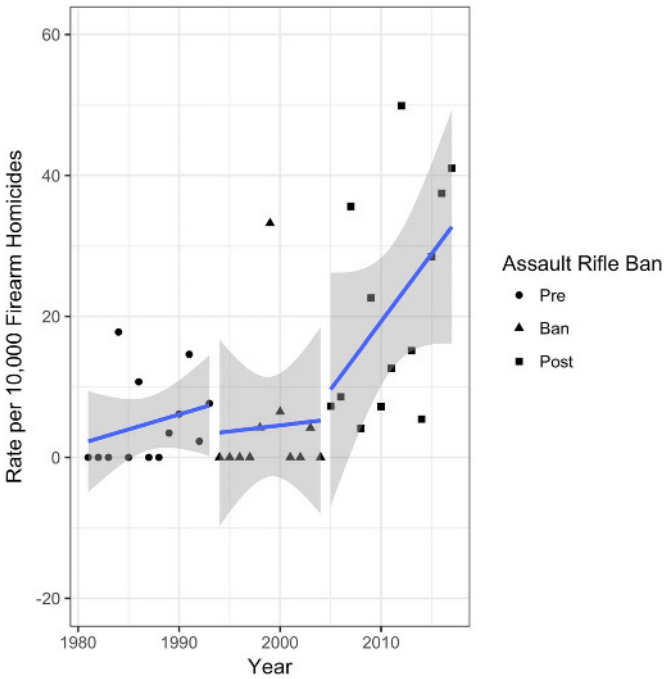

Figure 3. Mass shooting deaths per 10,000 firearm-related homicides with linear trends for preban, ban, and postban periods. United States 1981–2017.

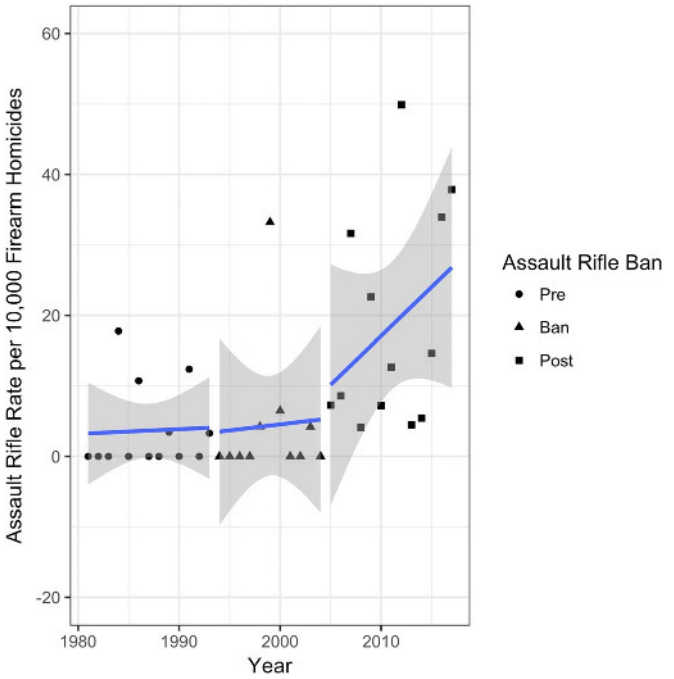

Figure 4. Mass-shooting shooting deaths per 10,000 firearm-related homicides restricted to incidents involving assault weapons with linear trends for preban, ban, and postban periods. United States 1981–2017.

restricted to just those incidents characterized by the use of an assault weapon indicated that seven preventable deaths during the ban period were due to assault weapons alone (Table 2).

The risk of mass shooting fatalities during the federal van period was 53 per 140,515 total firearm homicides compared with 448 per 348,528 during the nonban periods, for a risk ratio of 0.30 (95% CI, 0.22–0.39). The calculated risk ratio for the association of the federal ban period with mass-shooting fatalities as a proportion of all firearm-related homicides was 0.29 (95% CI, 0.22–0.29), indicating that mass shooting fatalities were 70% less likely to occur during the federal ban period.

The results of our sensitivity analyses were consistent with our main analyses for total mass shooting fatalities. In a linear regression analysis controlling for yearly trend and restricted to the period ending in 2016 using just CDC WISQARS homicide data as the denominator, the effect of ban period was associated with a statistically significant eight fewer mass shooting related deaths per 10,000 firearm homicides per year (coefficient for ban period, 8.0; p = 0.05). In a similar model using extrapolated CDC WISQARS homicide data for 2017 instead of Online Gun Violence Archive data as the denominator, the effect of ban

TABLE 1. Linear Regression Effect of 1994–2004 Federal Assault Weapon Ban on Mass-Shooting Deaths per 10,000 Firearm Homicides, United States, 1981–2017

Variable	Estimate	Std. Error	t	p
(Intercept)	−1409.4	333.0	−4.2	0.0002
Year	0.7	0.2	4.3	0.0001
Ban Period	−8.6	3.9	−2.2	0.03

TABLE 2. Linear Regression Effect of 1994–2004 Federal Assault Weapon Ban on Mass-Shooting Deaths Characterized by Use of Assault Weapon per 10,000 Firearm Homicides, United States, 1981–2017

Variable	Estimate	Std. Error	*t*	*p*
(Intercept)	−1219.7	333.9	−3.7	0.0009
Year	0.6	0.2	3.7	0.0008
Ban	−6.7	3.9	−1.7	0.09

period was associated with a statistically significant 9 fewer mass shooting related deaths per 10,000 firearm homicides per year (coefficient for ban period, 8.6; $p = 0.03$). A model based on the total yearly US population as the denominator, the effect of ban period was associated with a statistically significant 0.4 fewer mass shooting related deaths per 10,000,000 population (coefficient for ban period, 0.4; $p = 0.02$).

The results of a mixed-effects generalized linear Poisson model of yearly mass shooting fatality counts with an observation-level random effect to account for overdispersion were very similar whether the offset variable was the number of total firearm deaths or the population size. In either case, the assault weapons ban period was associated with an approximately 85% reduction in mass shooting fatalities (Table 3).

DISCUSSION

Recently, 75% of members of the American College of Surgeons Committee on Trauma endorsed restrictions to "civilian access to assault rifles (magazine fed, semiautomatic, i.e., AR-15),"[33] and 76% of the Board of Governors were in favor of a limit to "… civilian access to ammunition designed for military or law enforcement use (that is, armor piercing, large magazine capacity)."[34] In 2015, the American College of Surgeons joined seven of the largest most prestigious professional health organizations in the United States and the American Bar Association to call for "restricting the manufacture and sale of military-style assault weapons and large-capacity magazines for civilian use."[35] This analysis adds evidence to support these recommendations.

No observational epidemiologic study can answer the question whether the 1994 US federal assault ban was causally related to preventing mass-shooting homicides. However, this study adds to the evidence by narrowly focusing our question on the potential effect of a national assault weapon ban on mass shootings as measured through the lens of case fatality. While the data are amenable to a number of additional analyses, such as stratification by location (e.g. school vs. nonschool) or by characterization of large-capacity magazines versus non large-capacity magazine, we chose to focus only on year of occurrence and total number of fatalities. In this way, we relied on the least subjective aspects of the published reports. We believe our results support the conclusion that the ban period was associated with fewer overall mass-shooting homicides. These results are also consistent with a similar study of the effect of a 1996 ban on assault type weapons in Australia after which mass-shooting fatalities dropped to zero.[36]

While the absolute effects of our regression analyses appears modest (7 to 9 fewer deaths per 10,000 firearm-homicides), it must be interpreted in the context of the overall number of such fatalities, which ranges from none to 60 in any given year in our data. However, if our linear regression estimate of 9 fewer mass shooting–related deaths per 10,000 homicides is correct, an assault weapons ban would have prevented 314 of the 448 or 70% of the mass shooting deaths during the nonban periods under study. Notably, this estimate is roughly consistent with our odds ratio estimate and Poisson model results.

Our results add to the documentation that mass shooting–related homicides are indeed increasing, most rapidly in the postban period, and that these incidents are frequently associated with weapons characterized as assault rifles by the language of the 1994 AWB. We did not find an increase in the case fatality ratio of mass-shooting deaths to mass-shooting injuries. This might at first seem counterintuitive and paradoxical. The destructive effect of these weapons is unequivocal. They are engineered to cause maximum tissue damage rapidly to the greatest number of targets. However, it may be that the use of these kinds of weapons results in indiscriminate injury with additional rounds more likely to injure more people increasing the denominator in a case-fatality ratio. By contrast, the use of nonassault weapons may result in more precise targeting of victims. It is also possible that improvements in trauma care are driving down case fatality.[37] Also, it is worth noting that in absolute terms, there were many more fatalities outside the ban period and that survivable injury comes with its own physical, emotional, and economic costs, which have been estimated at US $32,237 per hospital admission.[38]

Despite US federal funding restrictions on firearm-related research dating to 1996,[39,40] there is a small but growing number of analyses of mass shooting violence in the United States. Many articles have focused on the mental health aspects of these incidents,[41–43] or on social effects like increased firearm acquisition following mass shootings.[44,45] However, fewer studies have taken a strictly public health or clinical approach. Among these, an autopsy-based study of the incidence and severity of mass-shooting casualties concluded the wound patterns differed sufficiently from combat injuries to require new management strategies, indicating there is much to be learned from a systematic epidemiological perspective.[46] Recently, there have been calls to remove such funding restrictions from both academics and elected officials from across the political spectrum.[47,48]

Our choice of data and analytic approach may reasonably be debated. We chose to base our analyses on the yearly rate of mass shooting fatalities per 10,000 overall firearm homicides. This is not a population-based risk estimate, but is in fact a risk as commonly used in the epidemiologic literature which is essentially a probability statement, that is, the number of events

TABLE 3. Exponentiated Coefficients Generalized Linear Poisson Model

	Homicide Offset		Population Offset	
Variable	Estimate	95% CI	Estimate	95% CI
Year	0.6	0.2	3.7	0.0008
Ban	−6.7	3.9	−1.7	0.09

Effect of 1994–2004 federal assault weapon ban on mass-shooting death counts. United States, 1981–20017.

that occurred over the number of times that event could occur. It is the risk of a homicide occurring as a result of a mass shooting. It may be considered a strong assumption to build mass shooting death rates based on the overall firearm homicide rate. The demographics of most homicide victims may differ appreciably from those of mass shooting victims. We selected this approach from among a number of imperfect potential denominators, believing that basing the rates on the number of firearm-homicides partly controls for secular trends in overall homicides and firearm availability. Our sensitivity analyses indicate that our results were robust to most any choice of denominator. We chose linear regression as our primary model because it was straightforward, accessible to most readers, accounted for linear trends in the data, and returned results in the metric in which we were most interested, that is, changes in the rate of fatalities. Our comparative Poisson model results were essentially consistent with the primary model.

These analyses are subject to a number of additional limitations and caveats, primary among which is that there is no authoritative source of data on mass shooting, and any one source may be biased and incomplete. It was for this reason that we chose to combine three independent sources of data, each with its own strengths and weaknesses, and base our analyses only on those numbers that were verified by all three sources. We further restricted our analyses to only the number of fatalities and the year in which the incident occurred, and to the strictest definition of mass shootings as defined by the Federal Bureau of Investigation.[27,28] Even with this approach, the data remain imprecise and subject to differing definitions. We attempted to compensate for this by framing our questions as precisely as possible, following the advice of the scientist and statistician John Tukey to pursue, "… an approximate answer to the right question ...(rather) than the exact answer to the wrong question..."

In this study, we failed to falsify the hypothesis that the AWB was associated with a decrease in mass shooting fatalities in the United States. However, it is important to note that our model did not include important and potentially confounding factors like state-level and local differences in assault weapon laws following the sun downing of the federal AWB. Additional analyses including such variables and using approaches like propensity score matching and regression discontinuity[49] with data further aggregated to state and local levels are necessary to test the strength and consistency of our results.

Federally referenced denominator data were not available for the last year of the study. We chose to use data from the Online Gun Violence Archive to account for firearm homicide in 2017. This resource is a nonpartisan not-for-profit group founded and maintained by a retired computer systems analyst and gun advocate.[50] The alternative would have been to extrapolate from the CDC data, but the 15,593 firearm-related homicides reported by the Online Gun Violence Archive in 2017 was more consistent with the 14,415 reported by CDC in 2016 compared with the 11,599 predicted by an extrapolation and returned more conservative estimates of the increased rate of recent mass shootings. We note there were many years in which the number of mass-shooting fatalities is listed as zero. There were, in fact, fatalities and incidents in those years that could meet a definition of mass shooting, but they were not reported by all three sources, or did not meet the strict criteria we set for this analysis.

An assault weapon ban is not a panacea, nor do our analyses indicate that an assault weapon ban will result in fewer overall firearm-related homicides. It is important to recognize that suicides make up the majority of firearm-related deaths in the United States, accounting for 60.7% of 36,252 deaths from firearms in 2015.[51] However, while this is a critically important issue in its own right, suicides differ fundamentally from mass-shootings, and are unlikely to be affected by an assault weapons ban. Also, compared with the 501 mass-shooting fatalities we counted, there were 489,043 firearm-related homicides in the United States. Public health efforts should be directed at reducing all gun violence and must be multipronged, including targeted initiatives to address mental illness and reducing access to weapons in those with a propensity for violence. However, taken in the context of the increase in mass shootings in the United States, these results support the conclusion that the federal AWB of 1994 to 2004 was effective in reducing mass shooting–related homicides in the United States, and we believe our results support a re-institution of the 1994 federal assault weapons ban as a way to prevent and control mass shooting fatalities in the United States.

DISCLOSURE

The authors have no conflicts of interest to declare.
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DISCUSSION

Ernest E. "Gene" Moore, MD (Denver, Colorado): Thank you, Dr. Rotondo and Dr. Reilly. Can I please have the discussion video. [sounds of a gun shooting]. Well, that is the AR15 rifle. Literally, 30 potential lethal shots delivered within 10 seconds. Is this safe to have in our society?

I congratulate Dr. DiMaggio and his colleagues from NYU for their superb presentation on a very timely issue. The AAST has had a long-term interest in reducing gun violence in the United States, and has recently published our 14-point approach. Access to assault rifles is one of them. At a reductionist level, mass shootings are the net result of (1) a deranged person intending to kill random individuals in a populated area, and (2) the use of an assault rifle. Since we seem to be unable to identify

the active shooter preemptively, we are left with the alternative solution of eliminating the weapon.

The presentation today provides evidence that a federal assault weapon ban can reduce mass shootings. According to our recent national trauma surgeon surveys, three-fourths of us in the audience, including me, would like to believe the analysis; but I think we need to consider some of the potential limitations.

Many of these issues relate to the fact that research support for gun violence control in the United States remains frustratingly suppressed and fundamentally inadequate. The general lack of information, low quality of data, and need to merge data sets from diverse sources – medical, coroner, police, legal, and behavioral – compounded by scarce funding and public controversy, undermine research to inform policy and enlighten the public. The fact that you had to compare three open-access databases to be certain that the reported mass shootings occurred underscores this deficiency.

Furthermore, there is no definition of a mass shooting, although you employed perhaps the most acceptable at the moment – the FBI's definition. Could you explain for us the rationale for this definition?

You present an analysis of 44 events with four or more deaths, including the shooter, from 1981 to 2017 – a 36-year period; whereas, others suggest a much higher incidence, such as Klaveras, who reported 69 shootings of six or more over the past 27 years.

Identifying all known mass shootings per year during a study period would be useful to appreciate the overall trends, as your data somewhat understates the magnitude of mass shootings in the United States.

You employed the Gun Violence Archive to estimate homicides in 2017. Why did you not use this source for mass shootings? The Archive has reported an alarming 261 mass shootings – defined as six or more shot – thus far in 2018. Nonetheless, in the sample you studied, assault rifles accounted for greater than 85 percent of the fatalities, and this is the key issue.

You have evaluated the impact of the federal assault rifle ban by analyzing the rate of mass shootings per 10,000 firearm homicide deaths per year to adjust for confounders. This would assume that the factors influencing mass shootings are the same as those for homicides, which seems very unlikely. You have idicated that you analyzed mass-shooting fatalities per population per year; perhaps you could elaborate more about this analysis.

Another confounder as acknowledged in the presentation is the impact of individual state limitations on magazine capacity. The first state to enforce these limitations was New Jersey in 1990, and now at least eight states and Washington, D.C., have these restrictions in effect. How can we distinguish the effects of this policy? And could this be a potential bridge to ultimately reestablish a national assault rifle ban?

You have also calculated the case fatality of all weapons in mass shootings per 100 total shootings, finding a decrease since 2010. While you conjecture this may be due to indiscriminate injury from assault rifles or possibly attributed to better trauma care, I am uncertain how this is relevant to the issue of banning assault rifles. The Las Vegas shooting is a cogent example of how these data may be misleading.

Finally, there is the issue of so-called falsification that could be addressed by examining other causes of trauma mortality during this time period.

In sum, this study adds to overwhelming evidence that assault rifles are an essential component in the dramatic escalation of mass shootings in the United States. While the scientific data to support a federal ban on civilian assault rifles is imperfect due to inadequate research support, I submit collectively the existing information argues strongly for enactment of this measure, and compliment the authors for their timely contribution.

Sheldon H. Teperman, MD (Bronx, New York): Dr. DiMaggio, your home institution, Bellevue, plays a seminal role in the trauma center safety of our nation.

In fact, right now, your trauma medical director is not present with us, but he is at home on guard for the U.N. General Assembly. But in New York, we don't see long-gun injuries. New York has the Safe Act, and there is an assault weapons ban. So why is it so important to America's trauma center – Bellevue – that we see a national ban on assault rifles?

Charles E. Lucas, MD (Detroit, Michigan): Thank you for your nice presentation. How many of these incidents occurred in an inner-city environment, where most of the victims that we treat have received multiple wounds which were purposely inflicted in order to compete competitively for the distribution of heroin and other drugs? Also, how many of the assailants were African-American?

Martin A. Croce, MD (Memphis, Tennessee): Thank you. I want to commend the authors for an excellent study, and really, not so much to ask any questions but I rise to put out a plea to the membership that this issue is a public health problem.

This is not a right versus left problem, this is not a Second Amendment problem. This is a public health problem.

And to quote Wayne Meredith at one of the recent Board meetings, "Our primary goal is to reduce the number of bullet holes in people." So I implore the Membership to correct this dearth of research that is going on about gun violence in order to promote a public health approach, so that we can reduce the number of bullet holes in people.

Deborah A. Kuhls, MD (Las Vegas, Nevada): And to carry on that thought, I would urge the authors to incorporate the public health data from the CDC when it is available, because part of the methodological issues for this paper is that one data set was used for a certain period of time.

But for the last year, the CDC data was not used because it was not available, so I would urge you to not only do that analysis, but I would also urge the Journal of Trauma to consider an update to that article when that is available. Thank you.

Charles DiMaggio, MPH, PhD (New York, New York): Thank you very much for all these comments and questions.

Dr. Moore, so with regard to your observation about the reductionist approach to looking at this particular issue, that puts me in the mind very much of the traditional epidemiologic triad of agent, host, and environment, and if you break one link in that connection, you can break the transmission. In this case, we could call assault weapons one link, whether it's agent or host, we can decide.

With regards to the rationale for the definition, I think it's reflective of the lack of research in this area.

A case definition is an essential and critical first step in any epidemiologic investigation, and you can see that we are barely there. I think the FBI definition makes sense, I think it's the oldest one, I think it's informed by expert consensus.

And I think all the other definitions are based in some form on that, which is why we chose it. And I would urge that if we are going to be doing this research going forward, probably it would be best if we all had the consensus that that be the definition.

Why did we not use the Gun Violence Archive to estimate some of these results, and why are our numbers so much smaller than some of the other numbers? I have to agree, our numbers are very much an under-count.

We restricted our analysis to these three databases. And so the limiting factor was the one database. And I can tell you it was the LA Times – they had the fewest number. And if it wasn't in the LA Times, then the other databases didn't contribute to this data set.

We felt that the important aspect of this particular study was to demonstrate the relative effects, merits or associations with the assault weapon ban as opposed to documenting the absolute numbers.

So the Gun Archive, for example, defines mass shootings as four or more deaths or injuries. That really raises the number of deaths that can be included. We didn't include it, but I think going forward we absolutely should.

With regard to the analysis using population denominators, we agree, actually, that gun homicides are an imperfect denominator. We also felt that population was an imperfect denominator. And again, as we keep on circling around, it has to do with the data in this case.

We did feel that gun homicides captured something about gun availability and criminality in the United States, although homicides themselves differ very much from these mass shooting fatalities.

We do note that our population-based results essentially mirrored the gun homicide results, indicating that, at least for the relative effects and benefits of the assault weapons ban, the results are robust and invariant to the choice of denominator in this case.

Can we distinguish local effects, and could this possibly be a bridge to reestablishing an assault rifle ban? The short answer is yes and yes. We can distinguish local effects.

We took a very broad approach on this particular study as a first pass on the data. But, there are data sources (and even within the data sources we used) where you can tease out local, municipal and state policies.

Also, we can link our data to other sources that have those variables. There are statistical methods available that will not only account for those variables, but also allow us to measure or estimate in some way the contribution of local or regional variation in these policies to the overall effectiveness.

The issue of the case fatality rate is very interesting and challenging. I want to note that there was a paper in JAMA on September 11th – just a couple of weeks ago – looking at mass shooter fatalities, that came essentially to the same conclusion – that there has been this recent decrease.

In our paper, in this write-up, we look at three potential explanations, and one of them is, first of all, it's just a matter of denominator. These are indiscriminate weapons.

You have someone shooting at a large group of people, and there are going to be more injuries and more casualties, and it just inflates the denominator in this case.

The second thing is, the obverse of that, is single-fire weapons, guns, are very personal weapons. They're usually characterized by someone who knows who they want to kill. And finally, we feel that perhaps there may be some improvement by the folks in this room in treating these.

I'm going to close at this point, given the time constraints.

Exhibit

Original Paper

Impact of Firearm Surveillance on Gun Control Policy: Regression Discontinuity Analysis

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Abstract

Background: Public mass shootings are a significant public health problem that require ongoing systematic surveillance to test and inform policies that combat gun injuries. Although there is widespread agreement that something needs to be done to stop public mass shootings, opinions on exactly which policies that entails vary, such as the prohibition of assault weapons and large-capacity magazines.

Objective: The aim of this study was to determine if the Federal Assault Weapons Ban (FAWB) (1994-2004) reduced the number of public mass shootings while it was in place.

Methods: We extracted public mass shooting surveillance data from the Violence Project that matched our inclusion criteria of 4 or more fatalities in a public space during a single event. We performed regression discontinuity analysis, taking advantage of the imposition of the FAWB, which included a prohibition on large-capacity magazines in addition to assault weapons. We estimated a regression model of the 5-year moving average number of public mass shootings per year for the period of 1966 to 2019 controlling for population growth and homicides in general, introduced regression discontinuities in the intercept and a time trend for years coincident with the federal legislation (ie, 1994-2004), and also allowed for a differential effect of the homicide rate during this period. We introduced a second set of trend and intercept discontinuities for post-FAWB years to capture the effects of termination of the policy. We used the regression results to predict what would have happened from 1995 to 2019 had there been no FAWB and also to project what would have happened from 2005 onward had it remained in place.

Results: The FAWB resulted in a significant decrease in public mass shootings, number of gun deaths, and number of gun injuries. We estimate that the FAWB prevented 11 public mass shootings during the decade the ban was in place. A continuation of the FAWB would have prevented 30 public mass shootings that killed 339 people and injured an additional 1139 people.

Conclusions: This study demonstrates the utility of public health surveillance on gun violence. Surveillance informs policy on whether a ban on assault weapons and large-capacity magazines reduces public mass shootings. As society searches for effective policies to prevent the next mass shooting, we must consider the overwhelming evidence that bans on assault weapons and/or large-capacity magazines work.

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KEYWORDS

firearm surveillance; assault weapons ban; large-capacity magazines; guns control policy; mass shootings; regression lines of discontinuity

Introduction

Background

Approximately 44,000 people are killed and an additional 100,000 people are injured by a gun each year in the United States [1,2]. Mass shooting fatalities, as a particular type of gun injury event, account for <1% of all gun deaths [3] and have largely been ignored until recently [4,5]; yet, mass shooting events occur multiple times per year [6]. This information is based on insights from firearm surveillance performed by a variety of researchers, and state and federal agencies on incidence, prevalence, risk factors, injuries, deaths, and precipitating events, similar to the surveillance of infectious diseases such as COVID-19 [7-21]. Teutch and Thacker [22] defined public health surveillance as

> *the ongoing systematic collection, analysis, and interpretation of health data, essential to the planning, implementation, and evaluation of public health practice, closely integrated to the dissemination of these data to those who need to know and linked to prevention and control.*

Not only do surveillance systems generate hypotheses to test but they also provide the data to test them.

The Federal Assault Weapons Ban (FAWB, also known as the Public Safety and Recreational Firearms Use Protection Act) included a ban on the manufacture for civilian use or sale of certain semiautomatic firearms defined as assault weapons as well as certain large-capacity magazines (LCMs). The Act was in effect for 10 years from 1994 until it sunsetted in 2004. Semiautomatic weapons (rapid fire) and assault weapons (second grip plus other features) are distinct; however, the two are often incorrectly conflated as similar [23-26]. Semiautomatic weapons are defined as weapons that automatically load another cartridge into a chamber, preparing the weapon for firing, but requiring the shooter to manually release and press the trigger for each round [23-26]. By contrast, automatic weapons are similarly self-loading, but allow for a shooter to hold the trigger for continuous fire [27]. Furthermore, the FAWB also prohibited certain ammunition magazines that were defined as "large-capacity" cartridges [28] containing more than 10 bullets [29]. These LCMs can feed ammunition to semiautomatic weapons that do not meet the criteria of being considered assault weapons. Furthermore, LCMs are considered one of the most important features of the FAWB as research has found a relationship between bans on LCMs and casualty counts at the state level [30-34]. The 10-year federal ban was signed into law by President Clinton on September 13, 1994 [28].

Firearm surveillance data have been used to test potential policy responses to prevent mass shootings, including the FAWB [32,34-39], Extreme Risk Protection Orders (also known as red flag laws) [40-45], and federal and state LCM bans [31,32,46]. In particular, it seems likely that the FAWB and LCM bans have potential to affect mass shootings because they regulate weapons and ammunition formats that are designed to enable rapid discharge, which is a key feature in mass shooting incidents [24,47]. Other types of gun deaths may not be responsive to the FAWB or LCM bans. As an example, Extreme Risk Protection Orders or "Red Flag" orders [43,48], which temporarily prohibit at-risk individuals from owning or purchasing firearms, may be effective for preventing firearm suicides or domestic violence homicides [49] but less effective for public mass shooters [50,51]. The prohibition of LCMs may have no impact on firearm suicide because suicide decedents only require one bullet to kill themselves [52].

Several studies during and after the FAWB attempted to determine if gun policy that restricts the production and sale of assault weapons and LCMs decreased gun deaths [53,54]. These initial studies make meaningful contributions to the literature because they describe what constitutes assault weapons, magazine capacity, ballistics, and loopholes in the FAWB legislation [3,53-57]. However, these studies have found little to no evidence that these policies have had any overall effect on firearm homicides, gun lethality, or overall crime [58-61]. Since deaths from public mass shootings comprise less than 1% of all homicides based on our definition, testing whether or not the FAWB/LCM ban has an impact on homicide would wash out the effect. Since the FAWB/LCM ban may be effective at specific types of gun deaths, sampling must be limited to specific types of shooters over overall gun deaths or tests for lethality [62,63]. Finally, the variation in research findings is related to differences in research design, sampling frame, and case definition of a public mass shooting [3,53-56,64,65].

Our study differs from other studies that evaluated the efficacy of the FAWB because we used economic methods and a different outcome variable. Specifically, we focused on whether the FAWB resulted in fewer public mass shooting "events," whereas other studies evaluated the number of gun injuries and deaths that occurred during the course of a mass shooting.

Objective

The aim of this study was to test whether curbing *access to certain types of guns and magazines* will decrease mass shooting *events*. We sought to empirically answer if there was a relationship between the FAWB and a reduction in mass shooting events.

Methods

Data Source

We created a firearm surveillance system based on the National Institute of Justice–funded Violence Project dataset, which culled mass shooting events from 1966 to 2019 [6]. Consistent with earlier studies, we rely on the original Federal Bureau of Investigation (FBI) definition of a massacre, specifically where 4 or more people are killed within a single timeframe. We differentiate our mass shootings from others in that our inclusion criteria require the shootings to have occurred in a public setting.

We adapted this definition to only include massacres that involved gun deaths of 4 or more victims to isolate a particular type of mass shooter [66]. Many firearm surveillance systems that include mass shootings use a lower threshold of persons shot and many do not include deaths. An FBI report on active shooters in mass shooting events identified planning and preparation behaviors that are central to prevention [67]. This more narrow definition isolates premeditation, whereas broader definitions may include shooters that are more reactive [68]. Our case definition does not include family annihilators or felony killers because *familicides are defined by the victim-offender relationship, public massacres are defined by location, and felony killings are distinguished by motive* [69]. This differentiation is consistent with other mass shooting studies [70-72].

We examined the annual number of public mass shootings occurring between 1966 and 2019 that resulted in 4 or more fatalities. The hypothesis was that the FAWB reduced the number of public mass shootings per year during the period of the ban. We used regression discontinuity analysis to test the hypothesis. Regression discontinuity analysis is a standard economist tool used in policy analysis taking advantage of quasi-experimental designs [65,73].

Analyses

Regression discontinuity analysis allows for discontinuities or shifts in both the intercept and the slope of the trend line at both the onset and sunset of the FAWB. That is, we introduced intercept shift parameters in 1995 and 2005, and trend shift parameters for the periods 1995-2004 and 2005-2019. A statistically significant shift in a parameter indicates a discontinuity (ie, a finding that the FAWB had a statistically significant effect on the number of public mass shootings). We tested for statistical significance of the intercept and trend shift parameters both independently and jointly. All statistical inference was based on a significance level set at .05. We used the Huber-White robust residuals, which attenuate problems of autocorrelation, heteroscedasticity, and some types of model misspecification [74].

We then used the estimated model for two types of counterfactual analysis. First, we used the model to predict the number of public mass shootings that would have occurred had the FAWB not been in place. The difference between this counterfactual prediction and the modeled number of incidents with the FAWB in place provided an estimate of the number of public mass shootings that the FAWB prevented.

Second, we projected forward the number of public mass shootings that would have occurred had the FAWB been permanent (ie, continued from 2004 through to the end of the sample period). We note that in some sense, this is an “out of sample” exercise because even though the sample extends to 2019, the FAWB ended in 2004; thus, this exercise would not pick up events in the past 15 years that would have augmented or compromised the effects of the FAWB. The difference between the modeled number of public mass shootings and the projected counterfactual number of public mass shootings could provide an estimate of the number of public mass shootings that the FAWB prevented.

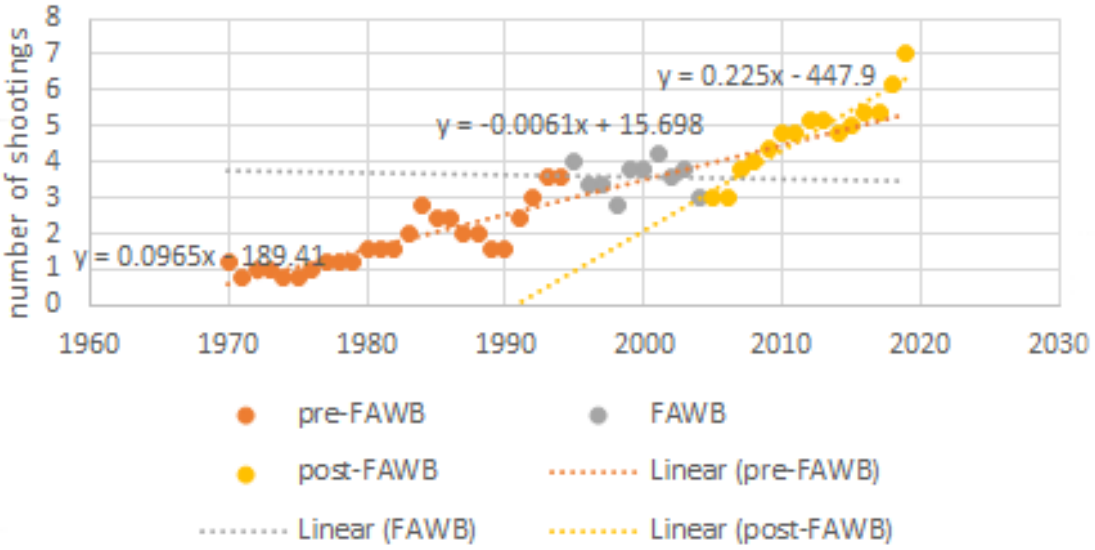
We performed a regression of the 5-year moving average of public mass shootings on the US population in millions, the homicide rate, and discontinuity variables to capture both the effects of the FAWB and its discontinuation. We did not introduce a trend line for the entire sample period because it is highly collinear with the population variable. For the period of the FAWB’s implementation, we originally introduced an intercept shift, time trend, and shift in the homicide rate; for the post-FAWB period, we introduced an intercept shift and a time trend. Due to collinearity, we retained only the trend shift in the final model for the FAWB period; for the post-FAWB period, we retained both the intercept and the trend shift.

Results

We identified a total of 170 public mass shooting events, the primary outcome variable, with 4 or more fatalities between 1966 and 2019. The 5-year cumulative number of public mass shootings is shown in Figure 1, providing a visualization of the impacts of the FAWB on the number of shootings. The first mass shooting occurred in 1966; hence, the first data point for the cumulative number of shootings over the previous 5 years occurs in 1970. For 1966 and 1967, the cumulative number of public mass shootings was 3. This number then increased to 12 in 1993 and declined to 3 in 2004. After 2004, the cumulative number of public mass shootings increased to 81 in 2019. The last year of the ban, 2004, experienced the fewest public mass shootings through 2019.

The regression results showed excellent explanatory power (R^2=0.94). The coefficient on population was positive and statistically significant (.044, P<.001). This coefficient means that for every increase in population of 1 million people, there are an additional .044 public mass shooting events per year. The coefficient on the homicide rate was negative and statistically significant (–.249, P=.01). The coefficient on the time trend for the FAWB period captures the effect of the FAWB; this coefficient was negative and statistically significant (–.187, P=.001). Using prediction models in combination with regression slopes, we estimate that 11 public mass shootings were avoided due to the FAWB. The intercept discontinuity for 2005-2019 was negative and statistically significant (–2.232, P=.001), and the trend coefficient was positive and statistically significant (.081, P=.001).

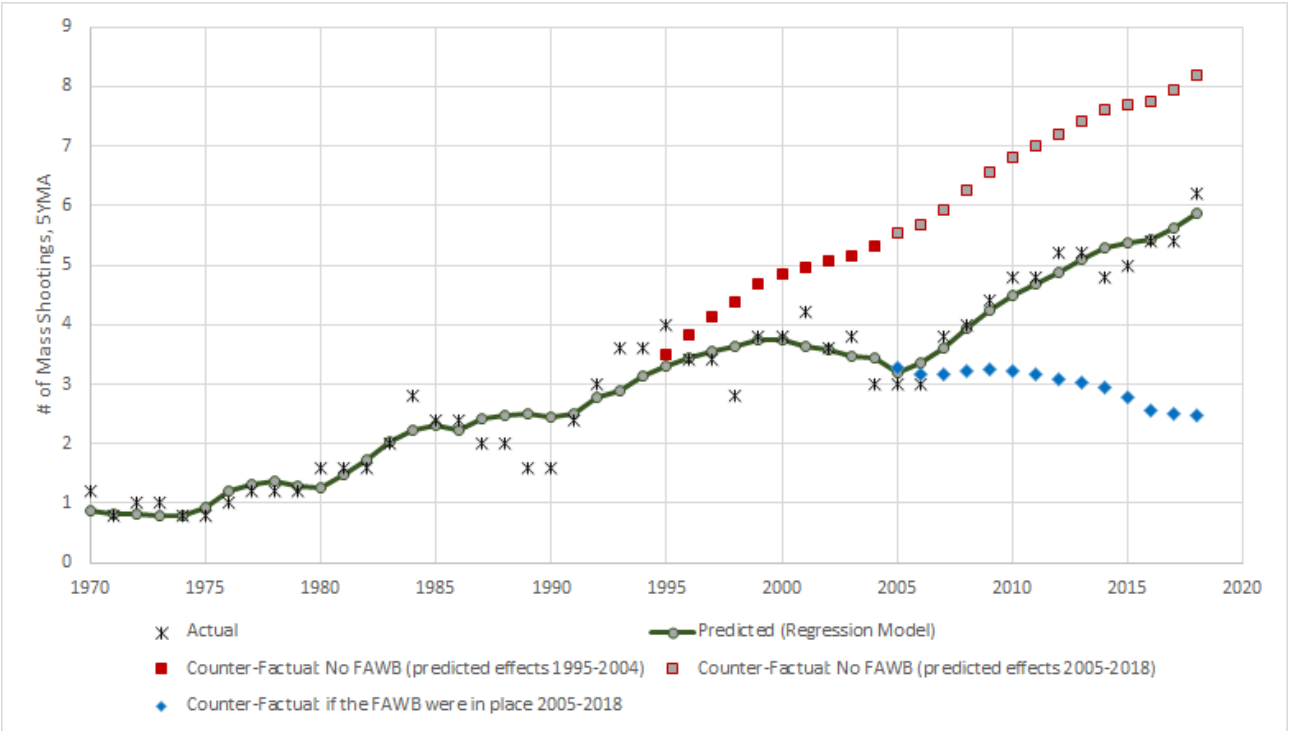
Figure 1. Public mass shooting trend line using five year moving averages (1966-2019).



These results are graphed in Figure 2 in which the black stars represent the actual data and the green line represents the predicted numbers of public mass shootings from the regression discontinuity model. A bending of the trend during the FAWB period to become downward sloping at the end of the period is apparent, as is the return of the upward trajectory upon expiration of the FAWB. The red squares represent the projected numbers of public mass shootings during the FAWB period had there been no FAWB. The difference between the red squares and the green lines represents the predicted number of public mass shootings averted by the FAWB. The model predicts that 11 public mass shootings were averted over the period of 1995-2004.

The blue diamonds represent the projected effects of a continuation of the FAWB through 2019 based on the observed trend from 1995 to 2004. This projection indicates that 30 public mass shootings would have been prevented from 2005 to 2019 had the FAWB been left in place.

Figure 2. Regression lines from discontinuity analysis of the federal assault weapons ban (1994-2004).



Discussion

Principal Findings

In total, 1225 people were killed in a mass shooting over the past 53 years with more than half occurring in the last decade, a function of increases in mass shootings and weapon lethality [62,63,75]. Public mass shooting fatalities and injuries far outpace population growth [75]. Between 1966 and 2019, the US population increased by 67% [76], whereas public mass shooting deaths increased by over 5-fold. The rise in public mass shootings throughout the sample period is in fact partially a function of population growth and homicide rate, along with the effects of the FAWB and its removal. An increase in the US population of 1 million people was associated with an increase of .040 (P<.005) public mass shootings per year. During the post-FAWB period, the increase in population from approximately 300 million in 2005 to 330 million in 2019 should be associated with an increase of 1.2 public mass shootings per year, compared to the actual increase of 4 public mass shootings per year in the data (5-year moving average). After controlling for population growth and homicide rate, a positive and statistically significant coefficient (.081, P=.001) on the 2005-2018 trend was seen. This further indicates a separate, nonpopulation trend of increasing violence operating during the post-FAWB period. The negative coefficient on the homicide rate invalidates the hypothesis that decreases in the numbers of public mass shootings are simply reflections of an overall decreasing homicide rate. The negative intercept discontinuity is consistent with an effect of the FAWB that persists somewhat beyond the immediate end of the ban. The positive trend coefficient is consistent with the hypothesis that the FAWB was associated with a decrease in the number of public mass shootings, as the expiration of the FAWB was associated with a shift from a downward trend to an upward trend in the number of public mass shootings per year.

The most striking finding from this study is that there was a reduction in the number of public mass shooting events while the FAWB was in place. Using prediction models in combination with regression slopes, we estimate that 11 public mass shootings were avoided due to the FAWB. By projecting what would have happened if the FAWB remained in place, we found that there would have been significantly fewer public mass shootings if the FAWB had remained in place to 2019. Remarkably, although it is intuitive that the removal of assault weapons and magazine clips will reduce the lethality of a mass shooting, we observed an inverse relationship between weapons/ammunition and mass shooting events, meaning that mass shooters may be less likely to perpetrate a mass shooting without rapid fire military-style weapons. This is an independent effect, which indirectly leads to fewer injuries and deaths. DiMaggio et al [64] also found evidence of a decrease in public mass shootings during the ban; however, their study period was shorter and was restricted to 51 public mass shootings. Unlike our study, they implicitly modeled public mass shootings as a random instance of general gun homicides that had a high death count [64]. In contrast, our findings suggest that public mass shootings are a unique type of premeditated gun violence. We found that prior to enactment of the FAWB, the rate of public mass shootings was increasing. During enactment of the FAWB, there was a downward trend of mass shooting events. After the FAWB was lifted, public mass shootings increased dramatically. Firearm homicides in general follow no such patterns.

This effect was not found in the work of Koper, Roth, and colleagues [53-55]; however, their inclusion of all gun homicides masks the ban's effect on mass shootings. Even though Peterson and Densley's [77] work focused on perpetrator histories and not the FAWB, their findings that ease of gun access is characteristic of public mass shooters further supports our study. We restricted the inclusion criteria to public mass shootings to specifically test the effectiveness of the FAWB on public mass shooting events.

Regardless of the FAWB, bringing a semiautomatic rifle with high magazine capacity to a massacre significantly increases the number of fatalities and injuries. The increase in deaths is a function of rapid fire and increased ballistic energy. The increase in injuries is also a function of rapid fire and high-capacity magazines, enabling the shooter to shoot more people in crowded venues quickly before the crowd can disperse or hide. When controlling for the FAWB, the use of assault rifles decreased by half during implementation of the ban and tripled after the ban was lifted. This is a particularly important finding given that the FAWB had loopholes and that overall violent crime is decreasing [78]. First, all people with an assault weapon prior to the FAWB were allowed to retain their semiautomatic weapons [54,64]. Second, without a buyback program, semiautomatic weapons remained in the community [54,64]. Third, the ban did not target some military assault-like weapons [54,64]. Finally, a major loophole found in gun control legislation is that buyers can bypass background checks by purchasing their weapons and ammunition from gun shows, through illegal purchasing, or legally purchasing their guns and ammunition from another gun owner [57,63,79-87]. Even with these loopholes and issues, there was still a significant reduction in public mass shootings during the FAWB. These loopholes indicate that most people who purchase assault weapons do not become mass shooters; however, mass shooters require assault weapons and LCMs to carry out a mass shooting. Ban effectiveness might have improved if all assault weapons were included in the FAWB.

Some recent studies have specifically analyzed the effects of LCM bans on the incidence of public mass shootings. In a review of state legislation, Webster et al [88] found that bans of LCMs were associated with a significant reduction in the incidence of fatal public mass shootings. This study shows that the FAWB, which included a ban on LCMs, was associated with fewer fatalities and injuries during mass shootings in addition to fewer public mass shooting events. Koper et al [27] previously reported that 19% of public mass shootings resulting in 4 or more fatalities included the use of LCMs, while only 10% involved an assault weapon. Klarevas et al [29] found a similar pattern in shootings of 6 or more people, in which 67% of shooters utilized LCMs, whereas only 26% utilized an assault weapon. Because our study only looked at effects of the FAWB, which included an LCM ban, we were only able to determine the combined effects of limiting assault weapons and LCMs. To be clear, the reduction in the number of public mass

shootings, and resulting fatalities and injuries, may be a function of the ban on assault weapons, assault weapons plus LCMs, or only LCMs. We cannot separate out their independent effects at the national level.

Unlike our study, Webster et al [88] did not evaluate the incidence of assault weapons used in public mass shootings. Rather, they focused on fatalities from public mass shootings vs public mass shooting events. Although Webster et al [88] utilized the FBI Supplemental Homicide Report as their dataset, which is a voluntary reporting measurement system prone to errors in reporting, their findings are applicable to our analysis.

Limitations

Although we found statistically significant decreases during the FAWB, we cannot isolate aspects of the policy that are attributed to the decline. Most notably, the FAWB also included LCMs during the ban. It may be that the type of gun and/or the type of magazine resulted in a decline. Indeed, assault weapons and LCMs provide the means to carry out a mass shooting; however, there are likely other factors beyond this study that partially explain the radical increase in public mass shootings in the post-FAWB period. For example, the FAWB was in place from 1994 to 2004, which is the same time period that the US population largely adopted the internet, along with associated social communication software and websites. This may have resulted in better tracking of public mass shootings or increased media coverage. Because our study specifically targeted the federal legislation, we omitted state-level gun policies such as state-level prohibitions on certain types of guns, LCMs, or more lethal types of bullets. It is likely that the internet serves as a contagion and as a guide to potential mass shooters, allowing them to access weapons and multiple stories about other mass shooters [62,67,89,90].

Conclusions

In summary, public mass shootings are a unique and specific type of homicide by a gun. We found evidence that public mass shootings are qualitatively different from general homicides because after the FAWB expired, mass shooting events increased while general homicides decreased. The increase in public mass shootings was more dramatic in the final 10 years of the study period following the end of the FAWB. We suspect that these outcomes may be improved by removing existing semiautomatic weapons with large bullet capacity by creating a buyback program for all rapid-firing weapons. Moreover, the legislation would be strengthened if it closed loopholes that allow gun buyers to get around the background check legislation and other purchase prohibitions by exempting gun shows and internet or person-to-person purchases, which were exempted from the FAWB and LCM ban [87].

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Conflicts of Interest

None declared.

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Abbreviations

FAWB: Federal Assault Weapons Ban
FBI: Federal Bureau of Investigation
LCM: large-capacity magazine

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Exhibit

VIEWPOINT

Regulating Assault Weapons and Large-Capacity Magazines for Ammunition

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Viewpoint pages 1177, 1179, 1181, 1183, 1185, 1187, 1189, 1193, 1195, and 1197 and **Editorial** page 1201

Supplemental content

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Mass public shootings in the US account for a small fraction of all firearm-related homicides, but have an outsized role in stoking the public's concern with firearm violence. The vivid instances of attacks on people in churches, schools, and offices and at other public gathering places do vastly disproportionate damage to peace of mind by creating a sense of peril in places that should feel safe. These attacks have been increasing in frequency and deadliness in recent years. As reducing this particular type of firearm violence becomes more urgent, the case for a variety of prevention measures becomes even stronger.

This Viewpoint focuses on a measure that is highly specific to the gun violence problem—stringent regulation of assault weapons and large-capacity magazines (LCMs) for ammunition. Federal law banned the introduction of new LCMs and military-style semiautomatic firearms between 1994 and 2004, but that regulation ended in 2004 and Congress did not renew it. Now, years later, the nation is experiencing the dire effects of opening the door to the manufacture and import of these weapons; it is time to close that door.

History and Current Status of Bans

The history of federal bans on weapons of mass destruction goes back to the 1934 National Firearms Act. Among other provisions, the Act required submachine guns and other firearms capable of fully automatic fire (ie, firing several shots with a single pull of the trigger) to be registered with the federal government.[1] All transactions involving such weapons were taxed at $200, a high confiscatory amount at the time. The registration and tax requirement remained in place, although inflation has substantially undercut the force of the transfer fee. The Act was expanded by Congress in 1986 to end the sale of new fully automatic weapons. There is every reason to believe that these restrictions have been effective. Even though the Thompson submachine gun was a notorious gangster weapon in the 1920s, fully automatic weapons of any kind are rarely used in crime in modern times or in mass public shootings.[1]

> Current estimates suggest that approximately 20 million assault weapons are owned by private individuals in the US, with millions of new assault weapons manufactured and imported each year.

The 1994 Federal Assault Weapons Ban extended the regulation of military-style weapons to include some semiautomatic firearms. These weapons fire 1 round of ammunition for each pull of the trigger, and are capable of firing at a rate of roughly 1 per second. The 1994 Assault Weapons Ban ended the legal manufacture and import of specified firearms, as well as ammunition-feeding devices (magazines) that held more than 10 rounds of ammunition. At the time, most prohibited assault weapons were equipped with detachable magazines that held 30 rounds and could accept magazines that could hold as many as 50 or 100 rounds, thus making it possible to fire dozens of rounds without pausing to reload.[2]

The 1994 federal ban on new assault weapons had gaping loopholes. First, the federal ban did not restrict possession or transactions of existing assault weapons and LCMs. Second, manufacturers found ways to slightly modify the design of some of the banned weapons so that they met the letter of the law while preserving the military appearance and the possibility of accepting LCMs and firing high-powered ammunition quickly. Still, there is evidence that the ban had some salutary effect on mass public shootings.

The LCM ban, also in effect during 1994 to 2004, was not subject to the redesign problem because it provided a bright line that was difficult for manufacturers to overcome. There were, however, an estimated 25 million LCMs in circulation when the ban was enacted, and those remained in circulation, but with no new additions.[2] It was not just assault weapons (as defined) that were designed to use LCMs, but a variety of other semiautomatic firearms as well, so the LCM ban had much broader scope.

When the law expired in 2004, manufacturing and importations of LCMs and previously banned weapons resumed, and a surge of sales followed. Current estimates suggest that approximately 20 million assault weapons are owned by private individuals in the US, with millions of new assault weapons manufactured and imported each year.[3] The industry initially advertised these weapons as "assault rifles," and continues to promote them with military allusions but has now rebranded this type of weapon as the "modern sporting rifle."

Seven states have some version of a ban or stringent restrictions on assault weapons: California, Connecticut, Hawaii, Maryland, Massachusetts, New Jersey, and New York, as well as the District of Columbia.[4] These laws are being challenged in the courts as a violation of the Second Amendment, but have survived these challenges to date.

Evidence of Potential Effectiveness of a National Ban

A review conducted by the RAND Corporation concluded that the handful of published studies on the effect of the ban on mass public shootings was "inconclusive" due in part to flaws in the analysis used by the 3 studies with positive findings.[4] But it is unlikely the surge in mass public shootings that involved assault weapons and LCMs that occurred after the ban would have happened if the ban had remained in place. The logic is straightforward. The sales of these weapons, which had declined during the ban, expanded greatly following its repeal, making them more widely available to everyone including would-be mass murderers.

To document recent trends in such mass public shootings requires a precise definition. One common definition for mass public shootings has several elements,[5,6] including: (1) a minimum of 4 homicides; (2) a public location; and (3) circumstance not attributable to robbery, other felonious activity, or commonplace conflict in families or among acquaintances. A comprehensive compilation of such events is the Violence Project's database of mass shootings in the US,[7] which includes the number of people killed and injured in each event and the type of weapon or weapons used.

Information from this database indicates that in the years following when the law expired in 2004, the number of mass shooting incidents greatly increased and the number of fatalities increased even more. During the period from 2015 to 2019, the number of incidents reached 33 (or 6.6 per year), which was almost twice the number during the decade the Federal Assault Weapons Ban was in effect (eFigure and eTable in the Supplement). The number of fatalities from shootings that involved banned weapons decreased during the second half of the ban (2000-2004) and then surged during subsequent periods, reaching a total of 271 during 2015 to 2019. It was during that 5-year interval from 2015 to 2019 that 5 of the top-10 deadliest mass public shootings in US history occurred, and all were committed with assault weapons.[8] The number of fatalities resulting from mass public shootings with other weapons has remained relatively flat.

The Australian Ban on Rapid-Fire Weapons

The Australian experience has factored into the debate over reinstituting the assault weapons ban in the US. In Australia, the impetus for banning semiautomatic weapons was a 1996 mass public shooting in Port Arthur, Tasmania, in which a young man killed 35 people with a semiautomatic rifle. Swift action by the federal and state legislatures produced legislation that banned not only manufacture and import, but private possession of semiautomatic rifles. To ease the transition, a series of firearm buybacks were instituted, and 1 million weapons were ultimately relinquished, estimated to be one-third of all privately owned guns. Australia had 11 mass shootings during the decade prior to the ban,[9] and 1 since then (a family killing in 2018 that would not count as a mass public shooting by the US definition).

The Australian experience is illustrative as a proof of concept for other countries, including the US. Of note, the ban covered all semiautomatic rifles, not just those with the specific features suggestive of use in warfare as opposed to hunting. The ban on possession of existing guns rather than only on the introduction of new guns greatly accelerated its apparent effectiveness.

Potential Next Steps

On July 29, 2022, the US House of Representatives passed the Assault Weapons Ban of 2022. To a large extent this bill reinstituted the 1994 ban, including the ban on the sale of new semiautomatic firearms deemed to be assault weapons, and of new LCMs holding more than 10 rounds. An important innovation is that for LCMs, the bill only allows continued possession and use of existing devices, but not transfer. However, given the reality that the US Senate will not enact this bill, it is useful to consider other approaches.

States could institute or expand assault weapon bans. Indeed, just a ban on LCMs would be a promising first step, impeding access to these products by individuals who could otherwise use them to fire multiple rounds of ammunition at large numbers of people before law enforcement can be mobilized to stop the killing.

Conclusions

In 2017, the *New York Times* polled "32 current or retired academics in criminology, public health and law, who have published extensively in peer-reviewed academic journals on gun policy"[10] to ask them what measures would be most effective in dealing with the mass shooting problem in the US, and an assault weapons ban was deemed overall by this panel to be the single most effective measure. The evidence in support of a ban has grown tragically stronger since then.[10]

ARTICLE INFORMATION

Conflict of Interest Disclosures: Dr Donohue reported serving as an expert witness for various government entities on matters related to assault weapons bans based on his research in this area.

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Exhibit M

Philip J. Cook

Research in Criminal Deterrence: Laying the Groundwork for the Second Decade

ABSTRACT

Deterrence theory has been developed primarily by economists, who have viewed potential criminals as rational decision-makers faced with an array of illicit opportunities characterized by costs (time, possible adverse legal consequences, and so forth) and payoffs. The crime decision is thus characterized in a way that fits the well-developed theoretical framework of decision-making under uncertainty. Herbert Simon and others have questioned the descriptive accuracy of this theory, and are beginning to uncover systematic patterns in decision-making that violate the predictions of the economic theory: this work could usefully be incorporated into the crime choice framework. One of the most important issues for further research in this area is the way in which potential criminals acquire information about criminal opportunities and the effectiveness of the criminal justice system. A simple "realistic" model of threat communication can be outlined that yields deterrence-like effects, even though no one is well informed concerning the true effectiveness of the system. Three other questions that have been of great interest to deterrence theorists are discussed: (1) what factors influence the rate at which active criminals commit crimes; (2) which dimension of the threat of punishment has a greater deterrent effect—likelihood or severity; and (3) what effect does the threat of punishment for one type of crime have on involvement in other criminal activities?

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Much of the recent empirical work on deterrence has used a fundamentally flawed approach to estimating the responsiveness of crime rates to sanction probability and severity. The flaw is that the measures of "probability of punishment" used in these studies reflect the choices made by criminals as well as the intrinsic effectiveness of the criminal justice system. Therefore, these measures do not serve as appropriate indices of criminal justice system effectiveness. The empirical approach that appears most productive is the evaluation of discrete changes in law and policy—"natural experiments," that can tell us a good deal about the deterrence process.

The core concern of deterrence research has been to develop a scientific understanding of the relationship between the crime rate and the threat of punishment generated by the criminal justice system. A decade ago, criminologists tended to view deterrence as an archaic theoretical construct associated with Bentham, Beccaria, and other somewhat naive scholars from the distant past. Deterrence research has enjoyed a revival during the 1970s, but so far has produced little more than a frame of reference, a variety of hypotheses and suppositions, and a scattering of empirical observations which are more anecdotal than systematic.

This essay serves in part as an introduction to modern research in criminal deterrence. My main concerns are to present a clear statement of the questions that have motivated social scientists working in this area, and a critical discussion of the methods used to answer these questions. This literature has already been summarized and critiqued by a number of scholars (e.g., Brier and Fienberg 1978; Carroll forthcoming; Chaiken 1978; Cook 1977; Ehrlich 1979; Gibbs 1975; Nagin 1978; Walker 1979; Zimring and Hawkins 1973). The most notable contribution of this sort is the recent report of the National Academy of Sciences Panel on Deterrence and Incapacitation (Blumstein, Cohen, and Nagin 1978), which offers a very well-documented assessment of the empirical literature. While this essay inevitably covers some of the same ground, it is more a complement than a substitute for the panel report; for example, I devote considerably more attention to discussing the theory of criminal choice, and organize

my discussion of the empirical literature in a way that I believe offers important new insights into the problems and prospects of this work.

For those who have not already acquired a taste for the theoretical and empirical investigation of criminal deterrence, some initial attempt to motivate the reader may be helpful. When criminologists assemble to exchange thoughts on crime control, a common observation is that the criminal justice system has little impact on crime rates; the big effects, so it is said, come from "root causes" such as demographic patterns, the influence of family and neighborhood, and the distribution of legitimate opportunities. Yet consider the likely consequences if we disbanded the police and rewrote the criminal codes to eliminate sanctions; there would surely be a crime wave of unprecedented proportions. Evidence from police strikes and related incidents supports this prediction.[1] Furthermore, the inevitable response to mushrooming crime rates would be the widespread development of private alternatives to the criminal justice system—vigilante groups and vastly increased efforts at private protection.[2] My assessment is that the criminal justice system, ineffective though it may seem in many areas, has an overall crime deterrent effect of great magnitude, and would quickly be reinvented in some form by the private sector if government got out of the business of issuing threats of punishment to would-be criminals. If this assessment is correct, it would be fair to say that the deterrents generated by the justice system have a large civilizing influence which is by no means minor in comparison to the influence of "root causes" of crime.

The everyday debates in the criminal justice policy arena are

[1] Police strikes in Liverpool (1919) and Montreal (1956) and the mass arrest of the Copenhagen police force by the Nazis in 1944 are discussed by Johannes Andenaes (1974). The huge increase in crime rates that followed each of these events is persuasive evidence that the threat of punishment has a substantial inhibiting effect on crime.

[2] Current private expenditures on protection against crime probably exceed total public expenditures on the criminal justice system. Bartel (1975) gives some empirical results on the demand for private protection, and both she and Clotfelter (1977) discuss the degree of substitutability between public and private expenditures.

not, of course, concerned with whether to stop punishing criminals entirely, but rather with questions of degree: how many tax dollars should be devoted to apprehending and punishing criminals, how severe a punishment is appropriate for each crime type, and so forth. The evaluation of these issues hinges in part on our assessment of the *marginal* deterrent effects of changes in the certainty and severity of punishment, a more problematic issue than assessing the overall deterrent effect of current threat levels. It is quite possible that mild penalties are almost as effective as severe penalties, or that a 50 percent change either way in the size of the typical big-city police department would have a much less than proportionate effect on crime. If there are sharply decreasing returns to scale in criminal justice system activities, then there is no contradiction between my assessment that the overall deterrent effect of the system is enormous, while the effect at the margin tends to be small or perhaps even zero in some instances. Estimating the magnitudes of marginal deterrent effects stemming from various criminal justice system activities is the ultimate task facing scholars in this area.

What is actually known about these magnitudes? The answer is "not much," if we exclude theoretical speculation, laboratory experiments, and results derived from badly flawed data and statistical methods. What is left is a collection of anecdotes—case studies—that suggest only one generalization: a wide range of criminal activity is subject to the influence of legal threats. A sample of recent findings supports this generalization. (1) Large increases in police patrol activity were effective in reducing robberies in New York City subways (Chaiken, Lawless, and Stevenson 1974) and outdoor felonies in the Twentieth Precinct of New York (Press 1971). (2) The increase in the perceived probability and severity of punishment for drunk driving resulting from the British Road Safety Act was initially very effective in reducing this crime and alcohol-related accident rates (Ross 1973, 1977). A reduction in the legal minimum drinking age from twenty-one to eighteen in Michigan, Wisconsin, and Ontario caused a small increase in alcohol-related accidents for this age group (Williams et al. 1975). (3) Draft evasion rates

during the Vietnam war era were responsive to conviction rates (Nagin and Blumstein 1977). (4) The increase in the likelihood of arrest for attempted airline hijacking that resulted from the airport security measures adopted in 1973 virtually eliminated this crime (Landes 1978). (5) The increase in the statutory punishment for carrying a gun illegally in Massachusetts (the Bartley-Fox Amendment) apparently reduced the use of guns in violent crime (Pierce and Bowers 1979).

These studies suggest that there exist feasible actions on the part of the criminal justice system that may be effective in deterring crimes committed by drunks (driving under the influence) and desperate men (hijacking); crimes that are widespread and not considered immoral (carrying a concealed weapon, underage drinking); crimes that are, for some at least, a matter of conscience (draft evasion); and common crimes of theft and violence. These studies do *not* demonstrate that all types of crimes are potentially deterrable, and certainly they provide little help in predicting the effects of any specific governmental action.

What about the various hypotheses and suppositions that constitute the conventional wisdom concerning deterrence? Are crime rates more responsive to changes in the probability of punishment than to equivalent changes in the severity of punishment? Are juveniles less deterrable than adults? Are "crimes of passion" deterrable at all? These and related questions may be answered by "common sense" or theoretical considerations, but relevant empirical evidence is weak or nonexistent. The first decade of social science research in criminal deterrence has generated many interesting questions but few answers.

This essay is organized as follows. Section I explains the model of individual rational choice, which is the centerpiece of deterrence theory, with an eye to answering the objections of those who find the model silly or implausible. I include a discussion of three questions of great interest to deterrence theorists. (1) What factors determine the rate at which an active criminal commits crimes? (2) Which dimension of the threat of criminal punishment has a greater deterrent effect—probability or severi-

ty? (3) What effect does the threat of punishment for one type of crime have on involvement in other criminal activities? Section II describes, analyzes, and rejects the "Ehrlich paradigm," the approach to estimating the deterrence effects that has dominated the literature during the last decade. Section III then summarizes and assesses the policy evaluation literature, with greater focus on technique than on specific findings. The final section proposes a partial research agenda for deterrence research in the 1980s.

I. The Crime Decision: Theoretical Perspectives on the Deterrence Process

The role of theory in the study of criminal deterrence, as in other scientific inquiries, is to generate interesting, testable hypotheses and provide a framework for interpreting empirical observations. A "good" theory explains known facts in a parsimonious way and generates accurate predictions. There are two main issues to be considered in a complete theory of criminal deterrence: first, the influence of the threat of criminal sanctions on the choices made by individuals regarding their participation in criminal activity; and second, the effectiveness of various criminal justice system activities in producing threats. This section is limited to the first issue; the threat production process is discussed briefly in section II.

A. The Rational Potential Criminal

An increase in the probability or severity of punishment for a particular type of crime, or both, will reduce the rate at which that crime is committed, other things being equal. This assertion is not an assumption but, rather, is derived from a theoretical argument, developed primarily by economists in recent years.[3] Observed crime rates are viewed as the aggregate result of choices made by rational individuals. Potential criminals weigh the possible consequences of their actions, both positive and negative, and take advantage of a criminal opportunity only if

[3] See Heineke (1978a) for a recent review. Gary Becker (1968) gave the first statement of this theory in modern times; his work was extended by Ehrlich (1973), Block and Lind (1975), Block and Heineke (1975), and others.

it is in their self-interest to do so. Jeremy Bentham expressed the point this way: "[T]he profit of the crime is the force which urges a man to delinquency: the pain of the punishment is the force employed to restrain him from it. If the first of these forces is the greater the crime will be committed: if the second, the crime will not be committed" (quoted in Zimring and Hawkins 1973, p. 75).

A satisfactory characterization of the "rational potential criminal" must elaborate on Bentham's proposition to take into account the subjectivity of "profit" and "pain," as well as individual differences in objective circumstances. Individuals respond differently to equivalent criminal opportunities, for reasons that include the following:

1. Individuals differ in their willingness to accept risks. The consequences of committing a crime are uncertain. Arrest and conviction are always less than certain, and for some common crimes the probabilities are small indeed. The consequences of conviction are also uncertain, given the wide discretionary power of judges in sentencing. Potential criminals will differ in their assessment of the probability of "losing" the gamble offered by a particular criminal opportunity, and also differ in the degree to which they are risk-averse.

2. Individuals differ with respect to "honesty preference"—the strength of their preference for behaving in a law-abiding manner. How much net "profit" is required to persuade an individual to overcome his ethical concern for staying within the law? Furthermore, for crimes that are *malum in se*, the individual's ethical concern may extend to the criminal act itself.

3. Individuals differ with respect to their evaluation of the "profit" to be gained from a crime. These differences are largest for crimes for which the payoff is not money (which most everyone values) but rather is "in kind"—consider, for example, crimes of violence, vandalism, draft evasion, and double parking.

4. Individuals differ in their objective circumstances: their income, the value they place on their time, their skills in committing crimes successfully and evading capture, and their reputation in the community. An arrest for shoplifting, followed by a

dismissal of charges, may be of little consequence for an unemployed teenager but may ruin the life of a college professor. An individual's circumstances also influence the nature of criminal opportunities available to him—few of us are in a position to embezzle money, fix prices, or commit treason.

Thus, the "profit" and "pain" associated with equivalent criminal opportunities will be evaluated differently by different individuals. Some may find it very worthwhile, others will be close to indifferent, while a third group will view it as highly unattractive. The key point is that a change in either the probability or average severity of punishment will cause some people to change their minds about whether the opportunity is, on balance, attractive, and thereby change their behavior. A small change will affect only those who were previously close to indifference (perceived "profit" and "pain" about equal); changing the behavior of others will require a larger change in probability or severity.

Most discussions of the deterrence mechanism distinguish between "general" and "special" deterrence. The latter concept refers to the deterrent effect of punishment on those who have been punished. This notion is a bit vague (Walker 1979). It is possible that those who have suffered a criminal sanction once will be more likely to be deterred by the threat of punishment thereafter, but there is no evidence to support this notion.

The threat of punishment may play a grander role than simply acting as a debit in the potential criminal's cost-benefit analysis of a crime opportunity. Cook (1977) discusses its role as a socializing and moralizing force.

Punishment in the form of incarceration reduces crime by incapacitating inmates (Cohen 1978). Correctional treatments may also reduce crime by rehabilitating some convicts, although existing programs appear to be largely ineffective (Lipton, Martinson, and Wilks 1975).

B. Objections to the Theory

The economists' theory of criminal deterrence, as characterized above, has been useful in developing the implications of a long neglected notion in the criminology literature—that criminals can

be viewed as rational decision makers intent on furthering their personal welfare in an environment that provides crime opportunities coupled with sanction threats. However, some critics find this assumption of rationality in the decision to commit a crime highly implausible and inconsistent with descriptive evidence on criminal behavior. Herbert Jacob (1979) succinctly states the two major objections with that assumption:

> (a) It implies that people who contemplate committing a crime have a realistic perception of the probabilities of being sanctioned and of the severity of the sanction. The little evidence we have on perceptions of legal sanctions by the general public indicates that these perceptions are incorrect and variable. . . . (b) It implies that people who commit crimes act after rational calculation rather than on impulse. We have much reason to believe that many crimes are committed on impulse, either under the influence of alcohol or simply as the result of opportunity and need intersecting. (p. 584)

Jacob's arguments are persuasive, and lead many criminologists to conclude that common appropriative crimes and much violence are not very responsive to the threat of punishment. But this conclusion does not follow from his argument. The existence of a strong deterrent effect does not require that potential criminals be fully informed or fully rational in their crime decisions. A theoretical model which postulates full rationality on the part of criminals is clearly "unrealistic" but may nonetheless generate valid predictions because it contains essential elements of truth. The assumptions of a rational choice/full information model can be relaxed without undermining the prediction that an increase in the threat of punishment will reduce crime. I deal with Jacob's objections in reverse order, since the second point is more fundamental.

1. Limits on rational calculation. It may be true, as Jacob suggests, that many criminals do not consider the consequences of their acts, other than those consequences which are obvious, certain, and immediate. This impulsiveness is often thought to be particularly characteristic of youths and of people who are in-

toxicated, in a state of high emotional arousal, deviant, or emotionally disturbed. These groups constitute a large percentage of the perpetrators of some types of crime. Are these crimes deterrable? Two affirmative arguments are worth mentioning.

Deterrence theory is concerned with making predictions about aggregate behavior. The accuracy of such predictions does not require that every individual act predictably. The prediction that crime is deterrable follows just as readily from an assumption that 10 percent of criminals are capable of rational decision-making, as from an assumption that *all* potential criminals have this ability; assuming, that is, that the remaining 90 percent do not respond to a change in the threat level in a systematically perverse fashion.

The deterrence mechanism does not require that each crime opportunity be evaluated separately or fully. Herbert Simon (1957) and his followers (Payne 1980) have developed the notion of "limited rationality" as a descriptively more accurate alternative to the "full rationality" notion propounded by economic theorists (see Carroll 1978 for a discussion of this issue in the context of the crime decision). Limited rationality models of decision-making incorporate observed limitations on people's capacity to acquire and process information. In particular, it is thought that people tend to economize on this scarce capacity by adopting rules of thumb, or "standing decisions," which eliminate the need completely to analyze every new decision. A person whose judgment is impaired by emotion or inebriation may still be guided by his personal standing decisions, which in turn may reflect concern with the threat of punishment. Most of us have long ago adopted standing decisions to refrain from robbery and assault, no matter what the circumstances. An increase in the threat of punishment may have the effect of persuading more people to adopt such decisions, thus inhibiting them from acting "on impulse" when next an attractive crime opportunity arises.[4]

[4] John Conklin's interviews (1972) with convicted robbers in Boston yield some anecdotal evidence on impulse control: "A few offenders stated that they could not trust themselves with loaded firearms, fearing that in a confrontation with a resisting victim they might 'lose their head' and shoot" (p. 111). Conklin reported that these robbers carried unloaded or partially unloaded guns.

This defense of the rational choice model is not entirely satisfactory. The remaining concern is that those potential criminals who are sufficiently thoughtful and aware to respond to changes in the threat of punishment will, under some circumstances, violate the norms of rational decision-making in some systematic and predictable fashion. If so, then it would be possible to gain improved predictive power from a theory which took these systematic deviations from rationality into account. For example, extensive experimentation by psychologists using human subjects demonstrates that people tend to make certain predictable errors in decision-making tasks involving choices between lotteries.[5] An example is the tendency of experimental subjects to ignore low-probability events entirely—a tendency which is confirmed by the failure of most residents of flood plains to buy heavily subsidized flood insurance policies (Kunreuther and Slovic 1978). In circumstances where people do take low-probability events into account (e.g., shark attack), there is a tendency to place an inappropriately large weight on these low-probability outcomes. Most of this experimental work has not employed criminal choice problems, although the analogy should be clear. An exception is Carroll's recent report (1978) of experimental findings involving crime choice with convicted criminals as subjects, which may prove the entering wedge to further research of this sort. Carroll's perspective is worth quoting: "The proposed approach thus offers a new model of how the person decides about crime opportunities. He or she is not viewed as the 'economic person' making exhaustive and complex calculations leading to an optimal choice. Rather, it is the 'psychological person,' who makes a few simple and concrete examinations of his or her opportunities and

[5] Two interpretative summaries of this literature are provided by Kahneman and Tversky (forthcoming) and Tversky and Kahneman (1974).

Some crimes, such as robbery, are usually committed by two or more perpetrators working together. The crime decision in this case must involve some sort of group process. Social psychologists have studied group decision-making in the face of risky choices, and documented a fascinating effect known as "risky shift"; the reference is to the tendency of a group discussion to shift the preferences of members of the group toward more risky choices than they would have selected before the discussion. This effect is observed only if the individuals who make up the group are already inclined to a relatively risky choice before the discussion. See Myers and Lamm (1976) for a review of this and other "group polarization" effects.

makes guesses that can be far short of optimal" (p. 1513). The challenge to deterrence theorists is to find predictable ways in which the "psychological person" deviates from the "economic person."

2. *Threat communication.* Jacob's first objection to the rational choice model of criminal behavior concerns the reliability of the threat communication process. Rational choice models provide a framework for analyzing the effect of the individual's *perception* of the legal sanction threat on his participation in illegal activities. This relationship is of theoretical interest but is not directly policy relevant: what policy-makers need is information on the effect of *actual* (rather than perceived) criminal justice system activities on crime rates. If perceptions were sufficiently accurate, there would be no need to distinguish between, say, the actual probability of arrest for a particular criminal act and this probability as perceived by various potential criminals. If the link between actual and perceived is weak, then one can question the claim that increased enforcement efforts will deter crime. A third possibility is that public perceptions are not accurate, but do tend to be systematically related to criminal justice system activities. This possibility serves as the basis for a response to Jacob's first criticism of rational choice models of criminal behavior.

What are the important channels by which information on the certainty and severity of punishment is communicated to potential criminals? Three channels are discussed below: the media, visible presence of enforcers, and personal experience and observation. Although these channels do not provide potential criminals with accurate information, the information they do provide is systematically related to the truth. That systematic relationship is sufficient to generate predicted deterrent effects.

The media. The threats generated by criminal justice system activities are "advertised" in the media, primarily through news reporting of legislative actions, newsworthy crimes and criminal court cases, introduction of new programs and policies, etc. Occasionally, officials will launch an effort to publicize a particular law enforcement effort, such as a crackdown on speeding. A

dramatic example of the possibilities for a media "advertising" campaign is the intensive publicity given the British Road Safety Act of 1967—most of the British public was aware of the provisions of this act by the time it was implemented (Ross 1973).[6] But such success is surely rare.

Verbal messages concerning specific provisions of the law, the likelihood of being caught, or both, are communicated through a variety of other means: bumper strips remind us of the 55 mph speed limit; roadside signs inform us that there are penalties for littering, that the local traffic enforcement unit employs radar, and that a residential area is protected by a neighborhood watch organization; official documents announce the legal penalties for supplying false information; and residences and stores post warning signs—"Shoplifters will be prosecuted," "Operation Identification," and so on.

The use of such official verbal communications is like other forms of advertising. The effectiveness of such messages might well be enhanced by a systematic application of the technology of using the media to inform and persuade, but Madison Avenue has not yet entered the crime control business.

Visible presence of enforcers. The proximity of police emits a potent signal that the probability of arrest for a crime committed in the immediate vicinity is high. A police cruiser eliminates driving infractions in its immediate area—an effect which is extended by CB radio communication. Private guards in stores, airports, and other public locations produce an analogous signal for would-be robbers, hijackers, and shoplifters.

The resources devoted to routine patrol activity by police would presumably be hard to justify unless this visible police presence had an effect beyond the immediate vicinity. If the police are seen frequently in an area, potential criminals may be persuaded that there is a high likelihood of arrest in that area due to presumed low police response time and the chance that

[6] The British Road Safety Act creates a precise scientific standard by which to judge whether a driver is legally "under the influence" of alcohol (viz., blood alcohol content in excess of .08 percent) and it establishes a mandatory one-year suspension of driving privileges for drivers who are convicted of violating this standard.

they will happen on the scene while the crime is in progress. While the relation between police visibility and public perceptions of their effectiveness has not been studied directly, there are a number of studies of the deterrence effect of the density of police patrol. These studies are reviewed in section IV.

Personal experience and observation. Active criminals accumulate personal experience during the course of their criminal careers; this experience surely has a powerful effect on perceptions of criminal justice system effectiveness among the group which is of greatest importance in the crime picture. If active criminals find that they are rarely arrested, unlikely to be convicted if arrested, and unlikely to be sentenced to prison terms if convicted, then they may acquire a justified sense of invulnerability. The effect of arrest and subsequent proceedings on the criminal's perception of the system's effectiveness is the key issue in the study of "special deterrence"—the deterrent effect of the punishment threat on an individual who has been convicted. An arrest can push the criminal's overall perception of the risk of punishment for crime up or down, depending on whether the consequences of arrest are more or less unpleasant than he expected. Probation and parole dispositions are interesting in this context when viewed as an effort to persuade the convict that he will be closely watched and is very likely to be imprisoned if rearrested.

Victims, witnesses, and jurors also acquire personal experience with the effectiveness of the system, and this experience may influence their perception of whether "crime pays." Furthermore, an active criminal's friends and associates may be somewhat aware of his criminal activities and their legal consequences. Thus, each arrest, court proceeding, and sentence may have a large influence on the perceptions of a relatively few people. On the other hand, the public at large is not likely to know about or be influenced by any one case, unless it is highly newsworthy.

This communication mechanism suggests that the deterrence process may often operate in a strikingly different fashion than is typically assumed in the rational choice models of criminal behavior. These models implicitly assume that each potential criminal in some fashion monitors the overall probability of appre-

hension and punishment for each crime type. By this assumption, each arrest and criminal disposition has some marginal (infinitesimal) effect on the perceptions of all potential criminals. This assumption seems highly unrealistic, given that even criminologists working with volumes of statistics have difficulty in measuring changes in these probabilities accurately (although the first two communication channels discussed above may provide potential criminals with some vague sense of the overall performance of the system). The alternative possibility, suggested here, can be stated as follows:

> Each arrest and disposition has a relatively large effect on the perceptions of a small number of potential criminals (including the arrestee himself), and goes essentially unnoticed by all others.

I have developed a model (Cook 1979d) which simulates the criminal behavior of a population of robbers, incorporating this assumption. The main features of this model are:

(a) At any time, a robber's perception of arrest and punishment is influenced by his own recent experience and that of a few "friends." Perceptions differ widely among robbers, because each observes only a small fraction of the actions taken by the system.

(b) Even if the true effectiveness of the system remains constant, there is considerable turnover among active robbers: robbers are deterred and "undeterred" according to their own experiences and those of their friends.

(c) An increase in the true effectiveness of the system results in a corresponding increase in the mean of robbers' perceptions of effectiveness, and an increase in the number of robbers who are deterred. These changes do not occur because the robbers observe that the system has become more effective, but rather because the likelihood that a robber will observe one or more friends apprehended is increased when the overall effectiveness of the system increases.

This model is abstract, and can be criticized for its simple, mechanistic assumptions concerning the complex phenomena of perception, communication, and criminal behavior. It does serve to demonstrate, however, that the deterrence process does not require that criminals' perceptions of the risk of punishment be accurate or that they be derived from observations of the overall performance of the criminal justice system. It may also serve the useful purpose of provoking further research into the communications processes which link official activity to individual perceptions of the threat of punishment.

The three communication channels discussed above do not exhaust the possibilities. In some instances, direct word-of-mouth communication among criminals with similar interests may be important; rumors concerning police and judicial activities circulate and at times have considerable potency. Another possibility is that potential criminals make judgments on the basis of direct observation of the extent of criminal activity in the area: if "everyone" is doing it, it must pay. A familiar example to many of us is the judgment of how much it is "safe" to exceed the speed limit; if the traffic is averaging 70 mph, then it seems safe to assume that the probability of being ticketed for driving 70 is very low.

In general, it is reasonable to assume that the relative importance of each of the several channels of information on criminal justice system effectiveness differs with the type of crime, the degree to which the potential criminal associates with criminally active people, and other factors. The link between official activities and the public's perception of them constitutes half of the deterrence story. Better understanding of this link could be exploited to the advantage of crime control efforts. Two examples are worth noting:

> The initial publicity given the British Road Safety Act apparently succeeded in giving the British public a greatly exaggerated impression of the true likelihood of being caught. While this impression evidently was corrected

after several years of experience, many lives were saved in the interim (Ross 1973).

Intensive police manning of the New York subways during high crime hours of the day initially caused a deterrent effect not only during these times but also during the rest of the day (when police manning levels were not changed). It has been suggested that this "phantom effect" could have been sustained by random changes in police assignments (Chaiken, Lawless, and Stevenson 1974).

Jacob's observations that potential criminals are poorly informed, and in some cases act impulsively, are valid but not sufficient to negate the predictions of deterrence theory. These predictions do not depend on every criminal being fully informed and rational. Limited rationality on the part of some fraction of potential criminals, combined with an information transmission mechanism that is systematic if not completely accurate, is sufficient to generate deterrent effects. Indeed, there is a great deal of evidence that criminals, like other people, respond to objective changes in their opportunities as if they were rational. It would be unfortunate to reject the claims of deterrence theory on the a priori grounds of implausibility.

On the other hand, careful descriptive studies and laboratory experiments to investigate the way in which individuals acquire information and evaluate opportunities may well yield some insights into criminal decision-making, insights that will help refine the predictions of rational choice models and even suggest means of increasing the effectiveness of the system in deterring crime.

The preceding discussion developed a basic perspective on the deterrence process, focusing on information processing and decision-making by the potential criminal. Three specific issues are discussed below from this perspective: the determinants of the extent to which an individual participates in criminal activity; the relative importance of the probability and severity of punishment in deterring crime; and the influence of sanction threats

for one type of crime on the relative attractiveness of other types of crime.

C. *Degree of Involvement in Crime*

Previous sections have discussed the deterrence phenomenon as if criminal activity were an all-or-nothing decision. Yet criminals differ widely in their degree of involvement in crime. The number of, say, robberies committed in a year is the product of the number of active robbers and the average number of robberies committed by each. The deterrence process may influence both factors: the *rate* at which active robbers commit crimes, as well as the decision whether to "enter" the robbery "business" at all.

The basic question with respect to intensity of criminal activity is this: what limits are there on the extent of participation in illicit activity of a potential criminal who decides that it is worthwhile to commit his first offense? The discussion focuses on property crimes and three mechanisms that may act to limit the activity level of an active burglar, robber, shoplifter, or other economic criminal.

I suspect that a large proportion of the population is "opportunistic" with respect to property crimes. Without special effort, many people occasionally encounter an extraordinarily good opportunity to steal, and take advantage of it. Examples include taking towels from a hotel, walking out of a shop without paying because the checkout lines are momentarily left unattended, and so forth. We can imagine each person having a standard rule of thumb by which he judges whether such opportunities are worthwhile; the more stringent one's standards (in terms of legal risks and payoff), the less frequently will one encounter suitable opportunities in the normal course of daily activities. An increase in the effectiveness of the criminal justice system or in the severity of punishment will reduce the number of suitable opportunities for those who are opportunists, with a resulting reduction in their individual theft rates.

A more active involvement in theft would be characteristic of people we ordinarily would think of as "robbers," "burglars,"

"shoplifters," etc. Instead of a series of yes-or-no decisions on opportunities supplied by the individual's environment, more active thieves would be concerned with searching out and developing opportunities, and would make explicit decisions about the intensity of their illicit activity. Two limiting factors for such people are the opportunity cost of time, and the effects of increased income on the willingness to take risks.

The latter effect seems relevant to understanding employee theft and embezzlement, income tax evasion, and other economic crimes for which time is not an important input (see Allingham and Sandmo 1972 for a formal model of this sort). Given that the magnitude of the offense is positively correlated with the risk of detection and punishment (and also the severity of punishment, perhaps) the miscreant can be viewed as choosing a risk-payoff combination from a continuum of possibilities. An increase in the effectiveness of the system for detecting and punishing criminals in these cases will make this type of crime less attractive and persuade some to "drop out" completely. For those who remain active, it is not obvious whether the augmented risk of punishment will cause an increase or decrease in the rate of offending. A perverse result of increased effectiveness may occur, for example, if the increase in effectiveness is concentrated at the low end of the theft spectrum; those who do not drop out may move up the continuum, given that the difference in risk for large and small thefts has been reduced.

For crimes which require a substantial time input, such as fencing, running numbers, and prostitution, the opportunity cost of time may be an important limiting factor in the extent of involvement. The legitimate wage rate would then influence both the entry decision and the decision with respect to degree of involvement. (Ehrlich 1973 develops a model of this sort, which is criticized by Heinecke 1978a. See also Block and Heinecke 1975.) Once again there is a theoretical possibility that an increased probability of apprehension will *increase* criminal activity levels for those who do not drop out. For example, if police start arresting prostitutes more frequently, some may increase their efforts in order to maintain their standard of living

while meeting the additional costs of bail, legal fees, and fines. This result is analogous to the theoretical possibility of a "backward bending labor supply curve"; there is nothing intrinsically irrational about people choosing to work harder in response to a reduction in the net rate of return to their efforts.

While these models of participation in illicit economic activities permit a theoretical possibility that an increase in the likelihood of detection will increase the overall crime rate, the actual importance of this possibility is doubtful. It seems more plausible that if more effective measures are taken against a particular type of criminal activity, the dominant effect will be to cause criminals to act with greater caution or to switch into other illicit or licit activities.

D. Certainty versus Severity of Punishment

One of the more intriguing issues in the deterrence literature is whether crime rates are more responsive to changes in the likelihood or the severity of punishment. The importance of this issue is suggested by two relevant policy dilemmas. First, sentencing authorities must allocate scarce prison capacity among felony convicts; one consideration is whether prison sentences should be relatively common but short, or relatively uncommon but long. Second, prosecutors have to decide whether to use their scarce resources to produce a high conviction rate with relatively low-quality convictions (through generous offers in plea bargaining), or to concentrate their resources on gaining high-quality convictions of a relatively few defendants while dismissing the remaining cases. The first alternative in each case is compatible with the commonly held view that the likelihood of punishment has a greater deterrent impact on crime rates than does the severity of punishment.

A precise illustrative statement of this hypothesis can be expressed as follows:

> A 10 percent increase in the average severity of punishment for a crime will have a smaller deterrent effect than a 10 percent increase in the likelihood of punishment.

For example, if the only form of punishment for convicted robbers is imprisonment, an increase in average sentence from three years to 3.3 years will have less deterrent effect than an increase in likelihood of imprisonment from .050 to .055.

The usual assumptions made in economic analysis of decision-making under uncertainty support this claim when the punishment is in the form of imprisonment, but support the opposite conclusion when the punishment is a fine. The argument behind these conclusions can be illustrated by the following two "lotteries" involving prison sentences. In the first lottery, there is a 10 percent chance of receiving a one-year prison sentence; the second lottery offers a 5 percent chance of a two-year prison sentence. These two lotteries have the same expected value (one-tenth of a year in prison), but most people would not view them as equally threatening; if two years in prison is not viewed as being twice as bad as one year, then the second lottery would be preferred. If so, then the first lottery would have a greater deterrent value. In general, we expect that increases in the probability of imprisonment, coupled with proportionate reductions in the prison term, will increase the deterrent value of the threat of punishment.

The second example involves punishment in the form of a fine. Suppose now that the prison terms in the two lotteries specified above are replaced with fines of $1,000 and $2,000 respectively. Once again the two lotteries have the same expected value ($100). If people are risk-averse, a common assumption in economic theory, they will prefer the first lottery (a $2,000 loss is subjectively more than twice as bad as a $1,000 loss to a risk-averse person). However, Tversky and Kahneman (1974) report that in laboratory experiments most subjects are *not* risk-averse with respect to financial losses, and would in fact choose the smaller probability of a proportionately larger fine. Once again, then, the first lottery should have greater deterrent value, and the conventional wisdom (among criminologists, not necessarily economists), regarding certainty and severity of punishment is reaffirmed. While this sort of theoretical analysis and laboratory experimentation seems rather remote from criminal behavior, it

is interesting to observe that this type of evidence does support the conventional wisdom.

The claim that certain punishment is a more effective deterrent than severe punishment is often buttressed by an assertion that crime rates are unresponsive to variations in severity. If true, the sentencing authorities could reduce average sentences a great deal without noticeable effect on the crime rate. The most compelling issue, and the one given the greatest scholarly attention, is whether capital punishment is a greater deterrent to murder than a long prison term. At the other end of the spectrum are questions concerning the potential loss of deterrent effect resulting from the increased use of diversion programs, suspended sentences, and fines in the place of incarceration.

It is commonly acknowledged that the threat of a more severe penalty will cause defendants to put more effort and resources into their defense. Indeed, one of the social costs of capital punishment, mandatory sentencing provisions, and related efforts to increase the severity of punishment is that these cases take up an increased portion of court resources through appeals and other defense efforts to resist conviction. It seems implausible that the severity of punishment should be highly salient to the criminal after arrest but not before.

While we would expect a rational criminal to respond in some degree to increases in the severity of punishment, it is certainly plausible that the marginal deterrent effect of increasing prison sentences declines rapidly as the length of the sentence increases, due to the tendency of people to discount the future. A simple mathematical model may be helpful in illustrating this point.[7] Suppose that an individual assigns one unit of "disutility" to a

[7] The model postulates that the individual's subjective evaluation of the prison terms is equal to the sum of the disutilities discounted to the present. If the disutility of one year in prison is denoted d, and the discounted present value of n years in prison is denoted D_n, then

$$D_n = \sum_{t=1}^{n} d\left(\frac{1}{1.15}\right)^{t-1}.$$

The value chosen for d does not influence the value of the ratios reported in the text, and was set equal to 1.

year in prison, and has a time discount rate of 15 percent per annum. It would then be true, in present value terms, that a two-year prison term has about 87 percent greater disutility than a one-year term. However, under these assumptions a twenty-year term has only 25 percent greater disutility than a ten-year term. It is plausible, then, that increasing the severity of punishment when punishment is mild may have a much greater deterrent effect (even proportionately speaking) than increasing severity when punishment is already severe.

E. Substitutes and Complements

Establishing a rational sentencing policy, and appropriate priorities in prosecution and police investigation, is complicated by the possibility that variations in the threat of punishment for one type of crime may affect the incidence of other crime types, via two mechanisms. First, given limited police, court, and corrections resources, increasing the priority given to one type of crime necessarily entails a reduction in the priority given one or more other crime types. Second, in deciding whether to commit one type of crime, criminals will be influenced by the legal threat not only to that crime type but also to related types of crime. The latter mechanism must be given consideration in any complete characterization of the deterrence process. An analogy from the economic theory of consumer demand provides insight and useful terminology for discussing this mechanism. Suppose the price of gasoline increases 50 percent due to a change in policy by the OPEC cartel. The primary effect would be to reduce the quantity of gasoline purchased. Secondary effects include an increase in the demands for public transportation, fuel-efficient autos, and central city housing, and a decrease in demand for luxury autos and suburban housing. Commodities which become more desirable when the price of gasoline increases are known as "substitutes" for gasoline; those which become less desirable are "complements." While the analogy is by no means perfect, I will use these terms to discuss the secondary effects of a change in the threat level to a particular type of crime.

1. Substitutes. Various types of property crime are presumably

substitutes for each other. Recidivism data demonstrate that there is a great deal of crime switching among active criminals; for example, 22 percent of men arrested for burglary in the District of Columbia in 1973 were subsequently arrested for robbery within three years (compared with 33 percent who were rearrested for burglary) (Cook and Nagin 1979). The Rand study of self-reported crime by a sample of forty-nine incarcerated robbers found that they admitted having collectively committed 1,492 auto thefts, 2,331 burglaries, 855 robberies, and 1,018 other serious thefts during their criminal careers (Petersilia, Greenwood, and Lavin 1978). Given this sort of versatility, one would expect that an increase in the relative law enforcement effectiveness against robbery would result in an increase in other types of theft crimes. Variations in other sorts of crime-specific deterrents would be predicted to have the same effect: if shopkeepers arm themselves, then thieves may switch from commercial robbery to commercial burglary; increased use of burglar alarms would have the opposite effect.

A second dimension to the substitution phenomenon is geographic displacement. A large increase in the number of police assigned to one precinct in a city may result in some increase in crimes committed in neighboring precincts. A houseowner who posts an Operation Identification sticker increases the burglary risk to his stickerless neighbor. Intensive police manning of the subway system may cause an increase in taxicab and bus robberies. Exact fare systems on buses may increase the robbery risk to convenience stores. I know of no studies of crime displacement across state lines or between distant metropolitan areas, but it is likely that some buyers of illicit merchandise (drugs, machine guns, stolen goods) travel some distance in order to take advantage of more lax enforcement in another jurisdiction. Organized crime operations would be expected to locate their activities so as to minimize legal risks, to the extent that other considerations permit; an example in this context would be the decision of where to land illicit drug shipments smuggled in from South America or Mexico.

A very important aspect of the substitution phenomenon fre-

quently arises in the design of criminal sentencing policy. It is thought that the structure of criminal sentences must include a strong marginal deterrent to the use of threat or violence to reduce the likelihood of violent resistance to arrest. If the typical sentence for robbery without violence is a long term of imprisonment, robbers may be more inclined to kill their victims and other witnesses. Defendants who are faced with the likelihood of conviction and severe punishment will be more tempted than others to jump bail and intimidate witnesses, knowing that even if they are caught there is little more that the system can do to them; this is, of course, the reasoning behind denying defendants the right to bail in capital cases.

Zimring and Hawkins (1973) discuss this aspect of sentencing policy in terms of the "fortress" and the "stepladder." The "fortress" approach is to erect a high and more or less uniform "barrier" around the domain of criminal activity. The "stepladder" approach adjusts the punishment to the seriousness of the crime, in the hope that if the potential criminal *does* decide to act, the penal code will provide an adequate incentive to limit the seriousness of his crimes. If the preceding discussion of the deterrent effect of changes in the length of prison term is correct, the bottom "rungs" of the stepladder must be kept low in order to allow "room" for effective differences in sentencing between robbery, robbery with victim injury, and robbery murder; the usual sentence for robbery should not be more than a year or two in prison. This type of policy must be evaluated in the context of priority-setting by police and prosecutors—if sentences are relatively uniform, then a greater burden is placed on officials to create a stepladder effect through gradations in the likelihood of arrest and conviction.

2. *Complements.* Complementarity arguments have been extremely important in motivating criminal justice policy in the area of heroin and handguns. A key argument for vigorous law enforcement efforts to interdict the flow of heroin and other illicit drugs is that an increase in the "effective price"[8] of such drugs resulting from law enforcement efforts will reduce the

[8] A term coined by Mark Moore (1973), and discussed in his article.

incidence of property crimes. Similarly, the crimes of illegal acquisition, possession, and carrying of handguns are thought to be complementary to robbery and murder. Both these claims of complementarity are highly controversial, of course, and even if there is such a relation it must be demonstrated that these roundabout techniques for reducing property crimes or murder are the most effective use of resources against these crimes.

There are some very interesting sorts of interrelations within market-oriented complexes of criminal activity. Typically illegal commodities markets will involve suppliers, middlemen, and customers. In prostitution, they are, respectively, the prostitutes, pimps, and johns; in heroin, they are the poppy growers and heroin processors, the importers and retailers, and the users; in burglary they are the burglars, the fences, and the purchasers of stolen merchandise. In each case, we would expect that law enforcement efforts directed at any one of the three types of actors would reduce the amount of criminal activity by the other two types of actors. For example, a crackdown on fencing would lower the price that fences pay to burglars and make fences generally more cautious in dealing with both burglars and customers. The result would be to reduce the rate of return to burglary, thereby causing a reduction in the number of burglaries and ultimately a reduction in the illegal purchase of stolen merchandise.[9]

The question for law enforcement officials is what strategy will be most effective in disrupting the market which supports each of these activities. In the case of burglary, for example, prosecutors can bargain with burglary defendants to gain convictions of fences, or vice versa. Undercover police can pose as fences to identify and collect evidence against burglars, or al-

[9] Strictly speaking, burglary and fencing are not "complementary" activities in the sense this term is used in economic theory. An increased legal threat to fencing does not *directly* cause a reduction in burglary, as would be true if they were complementary crimes. The reduction in burglary is an indirect effect of the crackdown on fencing, the direct cause being the reduction in the price paid by the fence.

Recent literature on prospects for combating fencing include Blakey and Goldsmith (1976) and Walsh (1976). Klockars (1974) provides a fascinating description of fencing activities.

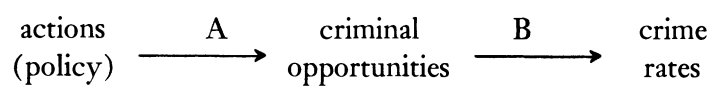
ternatively pose as burglars to facilitate arrests against fences. Similar strategic choices are available in illicit drugs and prostitution. The correct strategy should be dictated by the consideration of which of the roles in these illicit markets are most vulnerable to available techniques of law enforcement.

II. Empirical Study of the Deterrence Process

The discussion of theoretical issues in deterrence research presented above suggests a wide-ranging agenda for empirical work, including basic research on decision-making under uncertainty, on communications processes, and on the structure of illicit markets. The great bulk of the empirical deterrence literature, however, has been concerned with deriving estimates of the impact of criminal justice system activities on crime rates, and it is this body of applied research that I review here and in section III.

Measuring deterrence effects outside of the laboratory requires data on criminal opportunities and criminal behavior for a number of units of observation. Almost all studies have used some geographic entity as the unit of observation—precincts, cities, states, or the entire nation. The empirical study of deterrence has thus been concerned with aggregate rather than individual behavior. Practical problems of collecting data on individuals have prevented field studies of microbehavior.

There are two basic approaches to the empirical study of the deterrence process, which I label "criminal opportunity" and "policy impact." This distinction can be explained with the aid of a simple diagram:



In the diagram, the causal connection between crime rates and crime control policy (broadly construed to include the criminal law, resource levels, priorities, and so forth) is broken down into two links. Link A represents the effect of policy on the quality of criminal opportunities; this can be viewed as a production process in which criminal justice system inputs "produce" threats of punishment. The probability and severity of

punishment associated with each criminal opportunity thus constitute the vector of outputs of the system. Link B represents the deterrence effect of threats of punishment on crime rates. The criminal opportunity studies attempt to estimate the strength of this deterrence relationship for a variety of crime types. In many cases these studies also include a separate estimate of the production relationship (link A), so that it is possible by combining the two relationships to derive an estimate of policy on crime. Policy impact studies, on the other hand, estimate the effect of policy on crime directly, without considering the intervening variables characterizing the quality of criminal opportunities.

It would seem that the criminal opportunity studies are the more informative of the two categories, especially if the objective is to learn about the deterrence process rather than about policy impacts. However, these studies, unlike the policy impact studies, require the use of an index of the quality of criminal opportunities, or "threat level." I argue below that the measures of threat level actually used in these studies are not valid, and furthermore that the data necessary to calculate a valid measure are not usually available. In short, this approach appears to be a dead end, in spite of the numerous studies of this sort which have appeared in the economics and sociology literature during the last decade. Before justifying this rather extreme claim, I first give a more complete description of the approach and its intellectual history. A review of the policy impact literature is left for section III.

A. A Decade of "Criminal Opportunity" Studies

Jack Gibbs published the first article reporting a statistical analysis of this sort in 1968. Gibbs simply related (by a contingency table method) the murder rate with a variable intended to measure the probability of punishment—namely, the number of convicts sent to prison for murder divided by the number of murders—using cross-section data by state for 1959–61. He also related the state murder rates with the average prison terms served by incarcerated murder convicts in each state. He interpreted his results as evidence that murder is indeed deterrable.

Gibbs's technique was very primitive by reigning standards for the statistical analysis of nonexperimental data, since it did not attempt to control for other variables which influence murder, and took no account of the possibility that the causal relation between crime and punishment may go in both directions. The first state-of-the-art study was incorporated in Isaac Ehrlich's thesis in 1970, subsequently published in 1973—the same year as Sjoquist, and Carr-Hill and Stern, published very similar studies. These studies, while much more sophisticated than Gibbs's, used measures of the probability and severity of punishment similar to his. A paradigm was established by this work which has been employed since by a number of economists and sociologists. These studies have employed a variety of data sets, including state-level data for recent census years, data on large cities, data on precincts of New York and counties in California, and similar data sets for Canada and the United Kingdom.[10] The results of these studies have for the most part been favorable to the deterrence doctrine, seemingly documenting a statistically significant and often rather large effect of the "probability of punishment" as measured on each of the seven FBI index crimes. The results for the deterrent effect of punishment severity have generally been weaker and less consistently significant. However, Ehrlich's (1975) subsequent and highly sophisticated study of the marginal deterrent effect of capital punishment on murder estimated a deterrent effect so large that only the most confirmed abolitionist could claim it to be irrelevant—one way of summarizing his result is that each execution saves eight lives. This study received widespread attention, and was submitted to the Supreme Court as part of the solicitor general's brief in *Gregg v. Georgia*, 428 U.S. 153 (1976).[11]

The great potential importance of this work, and particularly the intense controversy engendered by Ehrlich's study of capital punishment, culminated in the formation of the National Research Council's Panel on Research on Deterrent and Incapacitative Effects. This panel performed a thorough review of all the

[10] Nagin (1978) includes a very useful table which summarizes these studies.
[11] Bailey (1978) has a brief history of the use of this and other such studies.

major reports published at that time, including replications of Ehrlich's work and a highly technical critique of the problems with the econometric paradigm employed in this literature. The panel's conclusion was decidedly negative: "The major challenge for future research is to estimate the magnitude of the effects of different sanctions on various crime types, an issue on which none of the evidence available thus far provides very useful guidance" (Blumstein, Cohen, and Nagin 1978, p. 7). The panel did not choose to reject the basic approach, however, but instead encouraged scholars to develop better data sets and seek methods for eliminating certain biases which they consider damaging to the validity of the results (pp. 46–50).

It is easy to criticize any nonexperimental statistical technique which employs error-ridden data to assess some aspect of a complex and poorly understood process. Much more difficult is to judge whether the criticisms are sufficiently important and damaging to warrant rejection of available findings, or even abandonment of the entire approach. If there is no practical alternative for studying the phenomenon, the relevant question is whether the statistical technique in question can generate results which are more reliable than intuition alone. In this case I accept the panel's conclusion as cited, but would go even farther than they in discouraging future use of the Ehrlich paradigm. My conclusion is influenced by the numerous problems discussed in the panel report and elsewhere,[12] but stems primarily from apparently insuperable difficulties with measuring the quality of criminal opportunities.

B. Measuring the Quality of Criminal Opportunities

Since the primary motivation for criminal opportunity studies is to estimate the response of crime rates to the probability and

[12] Studies of the deterrent effect that use cross-section or times series data on jurisdictions, such as those that fit the Ehrlich paradigm, suffer from a variety of statistical problems, including: (1) the poor quality of the data on crime; (2) the difficulty of distinguishing between the effect of punishment on crime rates, and the effect of crime rates on the likelihood and severity of punishment; (3) the difficulty in controlling for the variety of factors that influence crime rates. These problems are discussed below in section III, and are developed in detail in Blumstein, Cohen, and Nagin (1978), Cook (1977), and Brier and Fienberg (1978) among other places.

severity of punishment, obtaining valid measures of these variables is crucial to the whole enterprise. In practice, the measure of probability used in this literature is some type of clearance rate, most commonly the arrest rate or the ratio of prison admissions to crimes reported to the police. While these clearance rates may *look* like probability measures (they usually lie between zero and one), they cannot be literally interpreted as such. After all, the individual crimes reflected in these measures are not homogeneous but, rather, differ widely with respect to a number of factors. For example, the 1960 ratio of prison admissions for murder to murders committed in New York was .54 (see Vandaele 1978a, p. 331), but the probabilities of punishment for the hundreds of murders reflected in this ratio ranged from near zero (in the case of some skillfully planned gangland executions) to near one (for, say, murders of family members). If the clearance rate is not a measure of a single probability of punishment, then what does it measure? At best, it can be viewed as a measure of the *average* probability of punishment for crimes committed.[13] Is it appropriate to use the average probability as a sort of index of the overall effectiveness of the criminal justice system?

In fact, the clearance rate fails even as an index of overall effectiveness, because the clearance rate reflects not only criminal justice system activities but also the many factors (including the system's effectiveness) which influence the care and judgment exercised by criminals. (The argument here was first made in Cook 1979a and elaborated in Cook 1979c.) For example, robbers would be expected to adapt to an increase in the potential effectiveness of the system in solving robbery cases and gaining convictions of robbery defendants; if, under the new more effective regime, robbers tend to be more selective in choosing vic-

[13] The major source of inaccuracy in the clearance rate is in the denominator —the number of crimes. Cook (1977, p. 189) compares clearance rates for burglary using two measures of the number of burglaries committed: the "burglaries known to the police" in the Uniform Crime Reports, and the burglary rate estimates derived from the crime surveys in twenty-six cities sponsored by the Law Enforcement Assistance Administration. The differences tend to be large and variable.

tims and more cautious in their modus operandi, the observed change in the clearance rate may be misleadingly small.

Consider the following artificial example. Suppose that Crime City makes arrests and convictions in 10 percent of its street robberies and 20 percent of its commercial robberies in 1980. In 1981, the Crime City police organize a hidden camera program to combat commercial robberies, which is successful in increasing the probability of arrest and conviction for such robberies to 30 percent. This increase in effectiveness has a strong deterrent effect on commercial robberies, with some displacement effect to street robberies. Suppose the relevant numbers look like the data in table 1.

Usually the available data would not be detailed enough to permit separate analysis of commercial and street robbery. A statistician may therefore conclude that the hidden camera program had no effect—after all, the overall clearance rate did not change. The problem here is not that the clearance rate is inaccurately measured (although that too is usually a problem in practice)—the problem is that the clearance rate is not a valid index of the true effectiveness of the criminal justice system. In this example, the true increase in effectiveness had no effect on the clearance rate. If other numbers had been used, the observed clearance rate could have gone up—or even down.

Economists have studied this type of index number problem rather extensively (Fisher and Shell 1972). One conceptually simple solution is to construct a Laspeyres index. The Consumer Price Index is of this sort. In my numerical example, a Laspeyres

TABLE 1

	1980		1981	
	# of Robberies	Clearance Rate	# of Robberies	Clearance Rate
Commercial	100	.20	50	.30
Street	100	.10	135	.10
Total	200	.15	185	.15

index for the clearance rate would use the 1980 mix of crimes as weights in calculating clearance indexes for both 1980 and 1981. This index would be .15 in 1980 and .20 in 1981, the increase reflecting the actual increase in the effectiveness of the police. But there is little hope for the forseeable future that the detailed data necessary to construct such an index will become available.[14]

The only promising prospect for criminal opportunity studies that I can see involves "target-specific" analyses of victimization rates. We can imagine a study of bank robbery within a jurisdiction, for example, which characterized the robbery opportunities provided by each bank in terms of an assortment of attributes including presence of a guard, ease of escaping from the scene, use of hidden cameras, and average amount of loot available from cashiers. The extent to which these variables explain differences in victimization rates is a measure of the deterrent effect of these dimensions of the quality of bank robbery opportunities. Similar studies could be conducted of robbery and burglary victimization rates for other types of commercial targets, of shoplifting where the quality and display of the merchandise were the key measures, and of location-specific traffic violations as a function of the characteristics of the location. Such studies would yield useful information on the deterrence process.

III. Lessons from Policy Innovations

Major changes in criminal law and policy, if properly evaluated, can serve as object lessons concerning criminal behavior and the performance of the system. In particular, policy innovations which are intended to change the threat level can teach us about the process of threat production and the responsiveness of criminals to changes in the threat level. A number of such evaluations have been published during the last decade. These studies represent the beginnings of an empirical basis for deterrence-oriented policy formation.

Policy innovations which have been evaluated in terms of their

[14] A more complete discussion of the "endogeneity" problem in the use of the clearance rate is in Cook (1979a). Manski (1978) discusses some closely related technical issues.

deterrent effects include changes in the substantive law (legalization of abortions, change in the speed limit, reduction of legal drinking age), changes in resource allocation (increased preventive patrol, career criminals prosecution units), and changes in the severity of criminal sentencing provisions. (Zimring 1978 provides a summary of several of these studies.) Evaluations of these innovations have much in common with evaluations of innovations in other areas of social policy, and my review draws on this larger context to some extent.

A. Comparison with the Criminal Opportunity Studies

The main objective of the criminal opportunity studies, the deterrence research fitting the Ehrlich paradigm, is to isolate and measure the effect of the threat level on crime rates. Absent a valid index of the threat level, this objective is beyond reach. The alternative, incorporated in the policy impact studies, is to analyze the deterrence effects of factors which are thought to determine the threat level—the criminal code, the quality and quantity of committed resources, the organization of these resources, the quality of civilian cooperation, and so on. Whatever deterrent effect is generated by changes in these factors can be assumed to stem from the induced change in the threat level, but the magnitude of this change is unknown.

An example serves to illustrate this limitation of the policy impact evaluations. In 1966, the New York Police Department increased the number of patrolmen assigned to the Twentieth Precinct by about 40 percent. S. J. Press (1971) conducted a thorough and sophisticated evaluation of the impact of this increase, and concluded that it reduced "inside" felonies (those which are invisible from the street) by 5 percent and outside felonies 36 percent during the year following the change. These estimates are certainly interesting and relevant to evaluating the worth of the increase in police manpower. However, there is no way of measuring the change in the threat levels to inside and outside felonies, so it is not possible to derive an estimate of the responsiveness of crime to the threat level from this report. (Press does report the changes in the arrest rates for inside and outside

felonies, but, as explained above, the arrest rate is not a valid indicator for the threat level.) Given the large reduction in the number of outside felonies, we can conclude that the extra police were very productive in terms of augmenting the threat level, that the outside felony rate is highly responsive to changes in the threat level, or some combination of the two. This ambiguity frustrates the search for evidence on the degree to which crime is deterrable in the abstract sense formulated in the Ehrlich paradigm.

B. Three Approaches to Policy Evaluation

Three basic approaches to policy evaluation are distinguished by the type of data being used: (1) cross-section comparisons of jurisdictions which differ with respect to some dimension of criminal justice policy (e.g., police per capita, use of capital punishment for murder); (2) time series analysis of crime in a single jurisdiction before and after the adoption of some policy innovation; and (3) analysis of experimental field trials, involving random assignment of units to different "treatments" to test the efficacy of some policy innovation. Not all evaluations fit neatly into one of these three categories, but this partition is an adequate framework for discussing the relevant methodological issues.

The cross-section analyses involve correlating crime rates with "input" levels across jurisdictions. Several studies have analyzed interstate differences in crime rates as a function of the number of police per capita and other factors in order to measure the marginal deterrent effect of additional policy resources (see, e.g., Greenwood and Wadycki 1973 and Swimmer 1974). Several other studies have attempted to measure the impact of particular criminal code provisions (e.g., gun control ordinances, capital punishment) by systematic comparison of jurisdictions governed by these provisions with those which lack them (see, e.g., Maggadino n.d. on gun control).

The most frequently used approach is the "before and after" analysis of a policy innovation in a single jurisdiction. A partial listing of such studies published since 1970 is given in table 2. Some of these innovations were adopted as an experiment, in-

TABLE 2
Policy Impact Studies

Source	Intervention	Process Measures	Outcome Measures	Controls	Evidence of Deterrent Effect?
Williams et al. (1975)	Reduction in legal minimum drinking age from 21 to 18 in Michigan, Wisconsin, and Ontario.	None.	Drivers under 21 involved in fatal motor vehicle crashes: total; night time only; single-vehicle crash only.	Corresponding numbers for neighboring states.	Yes, but small.
Ross (1973)	The British Road Safety Act of 1967: creates "scientific" measures of drunkenness (.08% alcohol in blood) and mandates that suspect drivers submit to breathalyzer tests. Massive publicity campaign preceded implementation. Sanctions for conviction include a one year mandatory license suspension.	1. Survey of public knowledge of new law. 2. Number of breath tests administered. 3. Number of drivers charged under this and related laws. 4. Alcoholic beverage sales.	1. Total road casualties and fatalities. 2. Fatalities and serious injuries during peak drinking hours. 3. Fraction of drivers killed in accidents who were drunk.	1. Time series prior to enactment. 2. (a) Time series prior to enactment on same measure. (b) Fatalities and serious injuries for other times of the week. 3. Average for same measure prior to enactment.	Yes, strong initially.

TABLE 2 (*Continued*)

Source	Intervention	Process Measures	Outcome Measures	Controls	Evidence of Deterrent Effect?
Ross (1977)	Chief constable's order for stricter enforcement of British Road Safety Act in Cheshire, September 1975.	Number of breath-alyzer tests.	1. Fatalities and serious injuries. 2. Total crashes during drinking hours.	1. Time series before and after intervention. 2. (a) Time series before and after intervention. (b) Time series on total crashes during other times.	Yes.
Robertson, Rich, and Ross (1973)	Supervising judge's order to Chicago magistrates to sentence drunk drivers to 7-day jail terms, December 1970 to June 1971.	1. Numbers of arrests for DWI. 2. Conviction rates for DWI. 3. Number of 7-day jail sentences for all traffic-related offenses.	1. Auto fatality rate by month. 2. Pedestrian fatality rate.	1. Time series on both Chicago and Milwaukee. 2. Time series on both Chicago and Milwaukee.	No.
Landes (1978)	Mandatory pre-board screening of airline passengers and carry-on luggage in U.S., 1973.	Proportion of offenders apprehended within 12 months.	Number of domestic hijackings.	1. Time series of domestic hijackings. 2. Hijackings in other countries.	Yes.

TABLE 2 (*Continued*)

Source	Intervention	Process Measures	Outcome Measures	Controls	Evidence of Deterrent Effect?
Chaiken, Lawless, and Stevenson (1974)	Tripling of N.Y.C. Transit Police force in 1975, with the additional men placed in stations and on trains from 8 pm to 4 am.	1. Police manning levels. 2. Arrest rates.	1. Total felonies, total robberies, etc. 2. Felonies, robberies during 8 pm to 4 am period.	1. Time series prior to intervention. 2. Felonies, robberies during 4 am to 8 pm period.	Yes.
Beha (1977)	The Bartley-Fox Amendment creating a mandatory one year minimum prison sentence for carrying a firearm without a permit in Massachusetts. Implemented April 1975.	Various measures of arrests and dispositions of gun-related cases.	1. Number of FID cards and carrying licenses issued. 2. Fractions of aggravated assaults, homicides, and robberies involving firearms.	1. Time series prior to amendment. 2. Time series prior to amendment.	Yes.
Joint Committee on New York Drug Law Evaluation (1978)	The "Rockefeller" Drug Laws 1973, lengthening prescribed minimum prison sentences and creating a one year mandatory minimum sentence for heroin dealers.	Various measures of arrests and dispositions of heroin-related offenses in New York City.	1. Serum hepatitis cases and narcotics related deaths, N.Y.C. 2. Admissions to detoxification program and methadone maintenance in N.Y.C.	1. Time series, and corresponding series for Baltimore, Washington, D.C., and Philadelphia. 2. Time series.	No.

TABLE 2 (*Continued*)

Source	Intervention	Process Measures	Outcome Measures	Controls	Evidence of Deterrent Effect?
Press (1971)	Experimental increase of police manpower in New York City's 20th Precinct by 40 percent in October 1966.	Arrests for felonies and misdemeanors.	The differences in reported number of crimes between a previous "low manpower" and a "high manpower" period, weekly average seasonally adjusted. Calculated for 10 crime categories.	Corresponding differences calculated for groups of similar precincts. The precincts included in the control groups differ according to crime category.	Yes, for outdoor crimes.
Zimring (1972)	Decriminalization of abortion in Hawaii, 1970.	Number of legal abortions and ratio of abortions to live births, 1970–71.	1. Change in number of live births between 1969 and 1970. 2. Change in ratio of illegitimate to legitimate births, 1969 to 1970. 3. Change in number of live births by ethnic group.	1. Corresponding change in Oregon and California.	No.
Schwartz and Clarren (1977)	Experimental adoption of team policing in one district of Cincinnati, 1973.	Arrest data, measures of police-community relations.	1. Crime rates, measured by survey and by crimes reported by police.	1. Time series. 2. Crime rates in other districts of Cincinnati.	Yes, for burglary only.

cluding the team policing study in Cincinnati (Schwartz and Clarren 1977), the field interrogation study in San Diego (Boydstun 1975), and the increase in the Twentieth Precinct police force in New York (Press 1971). But these "experiments" lack most of the features of a complete experimental design, which would have to involve many geographic units sorted randomly between an experimental group (in which the policy innovation is implemented) and a control group.

A controlled experimental design with random assignment is generally viewed as the most reliable source of information about the effects of social innovations, and has been used on a large scale on subjects as diverse as the Salk vaccine tests and the negative income tax experiments. The use of this technique in criminal justice research has largely been limited to correctional programming studies, focused on rehabilitation effects. A partial (and famous) exception in the deterrence research is the Kansas City Preventive Patrol experiment (Kelling and Pate 1974).

C. *Methodological Issues*

The three approaches to policy impact evaluation share certain methodological concerns. A discussion of these issues serves as a more useful review of this literature than a summary of results, because policy impact evaluation has more promise than past. My discussion here focuses on problems of measurement and causation.

1. Measurement of outcomes. The first and often most difficult problem in outcomes measurement is obtaining *reliable* measures of target variables. The outcomes measures in the evaluation of a deterrence-oriented policy innovation are usually crime rates of some sort. A majority of relatively serious common law crimes are reported to the police, and these crime reports ordinarily are the most readily available data for measuring the impact of policy innovation. Problems arise with reliance on reported crime as a measure because reporting rates differ across jurisdictions and over time, and because the crime count is subject to manipulation by officials. For example, Chaiken (1978) discovered that the official records on subway crime in New York were

counterfeit to some extent, due to a police official's zeal to demonstrate the effectiveness of intensive police manning in reducing subway crime. Even without conscious manipulation of the data, large changes in police presence in an area may cause systematic biases in the data, due to the possibility that police visibility may influence reporting rates by citizens. For this reason some of the more careful studies have supplemented police data with victimization surveys (e.g., Schwartz and Clarren's 1977 report on the Cincinnati Team Policing Experiment; see table 2).

Victimless crimes pose a still greater measurement problem because they only become known to authorities by accident or by dint of police undercover work. A number of the studies listed in table 2 have resolved this problem by using available data on proxy variables thought to be highly correlated with the incidence of the crime in question. The three studies of drunk driving crackdowns and the study of changes in the minimum legal drinking age all used readily available data on traffic accidents and casualties. Beha's study (1977) of the Bartley-Fox Amendment employed robbery, assault, and murder data; he argues that if the crime defined in the amendment (carrying a gun without a license) were reduced by the harsh penalties it stipulated, the rate of violent crime would also be reduced. Zimring's study (1972) of the legalization of abortion in Hawaii employed data on the live birth rate as the basis for inferring the number of illegal abortions before legalization.

These proxies are plausible indirect measures of the victimless crimes targeted by these policy innovations. The real virtue of these proxies, however, is that they are of direct policy interest in themselves. Indeed, preventing serious traffic accidents is the raison d'être of drunk driving statutes, and preventing violent crimes was certainly the main purpose of the Bartley-Fox Amendment.

A second important issue in the measurement of outcomes is specificity. The usual categories in which crimes are counted are often too crude to provide sensitive indicators of policy impact. Several important examples come to mind. First, a change in statutory sentencing severity, as in the Rockefeller drug laws or

the Bartley-Fox Amendment, usually exempts juveniles. The measure of severity used in most studies fitting the Ehrlich paradigm, average prison sentence, is applicable only to adults and the rare juvenile defendant who is waived to adult court. Given that a large percentage of serious crimes is committed by juveniles, an outcome measure which does not distinguish between juveniles and adults will tend to be an insensitive and "noisy" indicator of the effect of the policy.

Studies of the deterrent effect of capital punishment[15] almost always use some aggregate criminal homicide measure as the indicator of impact, even though the capital sanction is ordinarily reserved for felony murderers and other relatively small subsets of homicide defendants, and would not be expected to deter the sorts of homicide which constitute the majority in these statistics.

The importance of using as specific a crime measure as possible is that most policy innovations have a small effect at best,[16] and this effect can easily be submerged and lost in the normal fluctuations of an insensitive indicator. Part of the persuasiveness of Ross's evaluation (1973) of the British Road Safety Act results from his use of highly sensitive indicators. Instead of limiting his study to the gross accident rate, he distinguishes between fatalities, casualties, and minor accidents (accidents associated with drunk driving are more serious on the average than others); further, he distinguishes between accident rates during common drinking hours and accident rates on weekdays. Press (1971) expected (correctly) that the increase in police manning of the Twentieth Precinct would have a greater effect on outdoor, visible felonies than on indoor felonies, and analyzed these two crime types separately. Zimring (1972) distinguishes between illegitimate and legitimate birth rates in his study of abortion. Beha (1977) missed a good bet in failing to distinguish between firearms assaults committed at home, and those committed away from home. The latter necessitated carrying a gun in violation

[15] Sellin's studies of capital punishment are critiqued in Ehrlich (1975), Cook (1977), and Klein, Forst, and Filatov (1978).

[16] This generalization is documented and discussed in Gilbert, Light, and Mosteller (1975).

of Bartley-Fox, and so the rate of such assaults should be the more sensitive to the new law.

The third important issue in outcomes measurement is *inclusiveness*. A complete evaluation of a policy innovation requires inclusion of all likely outcomes which are of concern to deterrence theorists or policy makers. The most common issue here is displacement—a policy innovation targeted on one geographic area or one type of crime will, in addition to a possible deterrent effect, displace criminals to other areas or crime types. Press studied crime rates in precincts bordering the twentieth; Williams et al. (1975) studied accident rates for youthful drivers in regions bordering states which had lowered their legal minimum drinking age; Chaiken, Lawless, and Stevenson (1974) studied the effects of nighttime intensive police manning on the New York subways on daytime subway crime rates and on robbery rates for buses and taxis. Obvious substitution possibilities resulting from Bartley-Fox include an increase in nongun violent crime, a substitution of more vulnerable targets for commercial targets in robbery, and a substitution of burglary for robbery. In general, predicting the sorts of displacement effects that are worth studying requires insight into criminal behavior and criminal opportunities.

2. *Measurement of inputs*. A change in law or policy, however important it looks in theory, may be undermined or transformed during its implementation. It is important to study the implementation of a policy innovation to facilitate interpretation of measured outcomes. In some cases a careful analysis of implementation has revealed that the criminal justice system has absorbed an apparently important innovation with hardly a trace, thus explaining the lack of effect on crime.

The Kansas City Preventive Patrol Experiment (Kelling and Pate 1974) is a case in point. In this experiment, fifteen contiguous beats were divided into three groups; five beats were to receive intensive preventive patrol, in five a normal level of preventive patrol prevailed, and in the remaining five preventive patrol was eliminated. While this experimental design suggests that visible police presence would differ widely among the three groups

of beats, Larson (1975) has argued that this was not so in practice. Police made it a point to patrol the perimeter of the "no patrol" beats, and to respond to calls in a highly visible fashion in these beats. A further indication of the lack of effect is that police response time to calls did not differ among the three experimental groups.

The Rockefeller drug laws, which increased statutory penalties for dealing in heroin and other drugs, had little effect on actual sentencing: the percentage of such defendants convicted and sentenced as felons was the same (11 percent) in 1976 as in 1973. Despite considerable advance advertising to the contrary, the British Road Safety Act of 1967 had little effect on the propensity of police to make arrests or issue citations in drunk driving cases. Similarly, the crackdown on drunk driving in Chicago, studied by Robertson, Rich, and Ross (1973), found there had been no significant change in arrest or conviction rates for drunk driving.

Of course, the innovation does not always get lost during implementation. Beha (1977) was impressed by the degree to which prosecutors and judges were carrying out the intent of the Bartley-Fox Amendment to impose one year minimum prison sentences on those guilty of carrying a gun without a license. None could argue that airport security measures introduced in 1973 were undermined during implementation—indeed, Landes (1978) reports that all hijackers since that time in the United States have been either killed or imprisoned. The team policing experiment in Cincinnati was successfully implemented for the first eighteen months, but undermined later by changes in policy. In any event, it is not safe to take any new policy at face value, and an investigation of its actual effects on the behavior of officials is an important feature of a complete evaluation.

In cross-section studies involving analysis of crime in jurisdictions which differ according to criminal code provisions or input levels, a common failing is to ignore differences in enforcement intensity. Maggadino (undated) compares states which differ with respect to gun control ordinances without analyzing enforcement procedures for these ordinances. A variety of studies

of the deterrent effect of capital punishment have simply compared murder rates of retentionist and abolitionist states, without considering the *frequency* of executions in retentionist states. Wilson and Boland (1976) argue persuasively that the number of police employed in a city is not a good measure of police activity, since police departments differ widely with respect to prevention programs and to the percentage of the force which is actually on the streets at any one time. Much of the information we would like to obtain from a policy innovation is lost if implementation of the policy is ignored. While it may not be possible to measure the change in the threat level, it is usually possible to obtain some empirical notion of the degree to which the new policy influenced activity levels and decision-making. Such information aids in interpretation of findings on the crime impact of the policy. In particular, if the innovation is found to have no significant effect on crime, input measures may help distinguish between two very different interpretations: "this type of crime is not deterrable" versus "this crime was not deterred because the actual performance of the system changed little or not at all."

3. Causation and control. Specifying the causal process which generated nonexperimental data requires that assumptions be made about how the different parts of the system being studied fit together. These assumptions are usually controversial and sometimes wrong. Indeed, Gilbert, Light, and Mosteller (1975) find in their wide-ranging review of social policy innovation studies that nonexperimental studies have reported misleading findings on a number of occasions, as demonstrated later by a controlled experiment. The two major challenges to the validity of a nonexperimental finding are the possibility of reverse causation, and the possibility that factors other than the policy innovation caused the observed effect.

In checking for the possibility of reverse causation, the key question is why the innovation was adopted at a particular place and time. The innovation may have been motivated by some feature of the level or trend in crime in that jurisdiction. For example, an unusual increase in traffic fatalities may motivate a

crackdown on speeding, which in turn is followed by a natural "regression" in fatality rates to the trend line.[17] The reduction in fatalities follows the crackdown but is not caused by it.[18]

Cross-section studies are particularly vulnerable to the reverse causation problem. Anyone who has correlated the number of police per capita with crime rates across cities understands this problem. This correlation is positive for most samples, simply because whatever deterrent effect extra police may yield is swamped by the reverse process: relatively high crime rates "cause" relatively large police forces, presumably due to the effect of crime on the public's demand for police protection. (See Cook 1977 for a discussion and display of these data.) The same effect must be expected in studies of interstate differences in gun control ordinances, capital punishment provisions, minimum legal drinking age provisions, and so forth—these laws are not adopted in a vacuum but, rather, are influenced by the public's concern with crime.

The reverse causation problem is not insurmountable. At least in principle, statistical techniques are available which permit estimation of a model that specifies equations characterizing both the deterrent effect of policy and the influence of crime on policy. The technical difficulties with these statistical techniques are a major topic of the National Academy of Sciences Panel's report (see Fisher and Nagin 1978).

Other than the problem of causal ordering, the most important challenge to the validity of a finding is the difficulty in controlling for factors, other than the policy innovation, which also influence crime rates. There are two basic approaches to controlling for other criminogenic factors. The first is to develop a model which explicitly specifies these other factors and uses a multivariate statistical technique which accounts for a number

[17] A regression effect of this sort was documented by Campbell and Ross (1968).

[18] The beauty of the imposition of the national 55 mile per hour speed limit in 1974, from an evaluator's viewpoint, is that it was clearly motivated by a consideration (the oil embargo) which had nothing to do with traffic safety. The unusually large reduction in fatalities in 1974 can be safely interpreted as a result of the new speed limit.

of these variables simultaneously. The second approach involves comparison of the crime trends for the group directly influenced by the policy innovation, with corresponding trends for similar groups not subject to the innovations. In either case, the objective is to predict what the crime rate *would have been* in the absence of the innovation, as a basis for comparison with the actual crime rate. The difference is, of course, a measure of the policy's impact on crime.

The multivariate approach is most often used in cross-section comparison studies. Crime rates differ among jurisdictions because of differences in criminal opportunities and the demographic, cultural, and socioeconomic characteristics of the populations. Only after accounting for these factors is it possible to partial out the specific effects of interjurisdiction differences in enforcement policy. One of the most important underlying differences among geographic units may be a complex of attitudes which can be labeled "public-spiritedness" or perhaps "respect for authority." In neighborhoods or cities characterized by a high degree of respect for authority, the crime rate will be relatively low due to effective citizen cooperation with police and prosecutors. (See Bayley 1976; Cook and Fischer 1976.) This attitude is also likely to be reflected in official policy, resulting in a systematic relationship between policy and crime rates across jurisdictions which adds to the direct effects of differences in policy. The difficulty in controlling for this complex of attitudes is in knowing exactly how it should be defined and measured. However, short-term policy impact studies in a single jurisdiction are immune to this problem if, as seems reasonable, attitudes toward authority change slowly.

Evaluations of individual policy innovations must control for criminogenic variables which tend to fluctuate over the period under consideration. Crime varies with the time of day, the day of the week, the season of the year, and a host of other factors. Controlling for these variables can be attempted through a multivariate model, estimated from historical data for the jurisdiction. More commonly, evaluation studies have used interrupted time

series analysis or comparisons with trends in crime rates for groups similar to the group that is directly affected by the innovation. The interrupted time series analysis is most persuasive when the implementation of the policy has an immediate "slam bang" effect on crime—a change in the crime rate which is much larger than would be expected from historical fluctuations in the crime rate. Ross (1973), for example, reported a 60 percent drop in the "drinking hours" auto fatality rate immediately after implementation of the British Road Safety Act. Landes (1978) reports that there was only one domestic airline hijacking during the first year of intensive airport security measures, compared with twenty-seven the preceding year. The possibility of documenting a large effect of this sort is enhanced by use of a specific and sensitive measure of crime, but slam bang effects are rare. Gilbert, Light, and Mosteller (1975) document this point for policy interventions generally; crime is no exception.

The choice of control groups for a nonexperimental innovation is more an art than a science. The criterion is that crime rates in the control groups should be subject to the same influences (except for the innovation itself), and respond to them in roughly the same fashion, as the target group. Zimring (1972) chose California and Oregon as controls in his abortion legalization study in Hawaii; Williams et al. (1975) also used neighboring states in their study of the minimum drinking age. Proximity as a basis for choice of controls is not limited to geography: Ross (1973) used auto fatality rates during nondrinking hours, and Chaiken, Lawless, and Stevenson (1974) used subway crime rates during daytime hours. In some cases different age groups can serve as a basis of comparison—Williams et al., for example, could have used the auto fatality rate for drivers aged 21–24 as a control for his study of underage drinking.

An alternative to proximity as the basis for choice of control group is similarity. Press (1971) did not use precincts neighboring the twentieth as his controls, but rather chose groups of precincts (different for each crime type) which were similar to the twentieth in terms of population and crime rate. Beha (1977)

compared violent crime in Boston with other large cities in the Northeast in his study of Bartley-Fox.[19]

4. Generalizations. Valid generalizations from the policy impact studies are few, and leave us far short of being able to answer the many questions posed by the theoretical discussion of deterrence in section I. Perhaps the only general statements worth making are: (1) a wide variety of crimes are deterrable, and there are no types of crime which have been demonstrated to be undeterrable; (2) the criminal justice system has considerable inertia, with seemingly large policy innovations often resulting in small change in the behavior of officials; and (3) given the difficulty of evaluating policy impacts, the fine points of deterrence theory will have to be checked out in the laboratory rather than the field. But the gradual accumulation of data from the field will certainly enhance our feeling for what works, and under what circumstances.

IV. Notes on a Research Agenda

Research relevant to understanding and managing the criminal deterrence process includes a wide range of topics and research methods. The five topics discussed below strike me as deserving greater attention by criminologists and research funding agencies than they have received in the recent past.

1. Comparative studies of risky decision-making. Laboratory experiments in decision-making under uncertainty can provide information on how decisions are influenced by the threat of adverse consequences of varying probability and severity. Extrapolating from the artificial laboratory setting to the "real world" is difficult, of course, but some questions are hard to investigate in a natural setting. One such question is the extent to which such factors as age, emotional arousal, and inebriation are related to "deterrability." One illustrative issue here is whether people tend to be more willing to risk adverse consequences when drunk

[19] Whatever the reasoning behind the choice of controls, it is important to validate the choice by correlating the crime rate for the control units with that of the target unit, preferably over a substantial period of time prior to the innovation. Omission of this validity check is a common failing of this literature.

than sober; a more important issue is whether this willingness to risk adverse consequences is less responsive to changes in the threat level when the subject is drunk than sober.

2. *Threat communication.* The extent to which the threat of punishment deters crime depends to some extent on how this threat is "marketed." Several lines of research may prove useful in this regard:

—An analysis of research findings on commercial advertising, dissemination of information on new products, etc., as a source of hypotheses concerning threat communication.

—Interviews with active and potential criminals to determine what sorts of information they regularly acquire on the effectiveness of law enforcement activities.

—Studies of the criminal's response to specific environmental cues related to the likelihood of arrest and punishment, including visible police patrol, signs posted to warn would-be violators ("shoplifters will be prosecuted"), and so forth.

3. *Complements and substitutes.* As explained in section IE above, the incidence of one type of crime will be influenced by the effectiveness of law enforcement efforts against closely related types of crime. A crackdown on fencing may reduce the burglary rate; a crackdown on carrying concealed weapons may reduce the rates of armed assault and robbery; an increase in the severity of sentencing for selling heroin may increase the rates at which defendants jump bail and attempt to intimidate witnesses before trial. Research on such interconnections among crime types should aid in targetting law enforcement resources.

4. *Private protection activities.* Expenditures on private protection against crime have been growing faster than public expenditures, and the total private and public expenditures are now of the same order of magnitude. Some types of investments in private security—guards, burglar alarms, hidden cameras—increase the probability of arrest and conviction for crimes against targets that are so protected. We would expect private efforts to enhance the overall effectiveness of the system, while at the same

time increasing the victimization rate of targets that remain unprotected. These effects may be quite large, and should be given greater attention by social scientists.

5. Other preventive effects of punishment. Deterrence effects have almost been ignored in discussions of the other preventive effects of punishment. This sort of compartmentalized thinking is dangerous for policy prescription and costly to the scientific development of criminology. If the threat level influences the *rate* at which active criminals commit crimes, as well as the *number* of criminals who are active, then the measurement of incapacitation effects cannot ignore the deterrence phenomenon (Cook 1979d). Similarly, the outcome measures almost always used in studies of correctional rehabilitation—some sort of recidivism rate—will be influenced via deterrence by the threat environment facing the released convict. A related concern is the possibility that a correctional program will have a large enough effect on the severity of punishment to undermine the deterrent effect of punishment—a finding of reduced recidivism is insufficient to demonstrate that the rehabilitation program reduced crime.

Together, these five research topics would substantially expand the range of deterrence research, and they by no means exhaust the list of interesting possibilities. But to an important extent, productive research projects cannot be identified deductively—there should be a large element of opportunism in the choice of projects. The richest source of the "raw material" for deterrence research has always been dramatic changes in criminal justice policy in state and local jurisdictions, and that will continue to be true. The keys to exploiting this raw material are early involvement and special data collection efforts.

Franklin Zimring (1978) has written an excellent analysis of the research implications of recent policy experiments in deterrence. He concludes that a great deal of useful information which could have been extracted from recent innovations was lost because of poor planning. A full evaluation of an innovation usually requires special data collection efforts. Measuring sensitive outcome variables and controls, and gathering information on implementation, require careful planning, an early start, and access

to official records—all of which have frequently been lacking with respect to major policy innovations. The problems in evaluating policy impacts for deterrence effects have much in common with policy evaluations in other areas of social policy. The greatest challenges to any such evaluation are measuring what are often small (but possibly important) effects, and measuring long-term effects.

The first decade of deterrence research has had some false starts and some successes. The successes in empirical field research have, for the most part, involved careful studies of specific policy changes. The major false start has been what I have called the "Ehrlich paradigm," though Isaac Ehrlich is only one of many who have utilized this approach. The appeal of this approach lies in the seeming generality of its empirical results. I believe there is a moral here: the quest for a single set of universally applicable estimates of deterrence effects is hopeless, given the nature of available data and the complexity of the underlying process which generates crime rates and sanction threats. It may pay deterrence researchers of the next decade to be modest. Sound generalizations will gradually emerge from the accumulation of carefully tested evidence on the deterrence process.

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