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National Institute of Justice

Research in Brief

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Firearms and Violence

by Jeffrey A. Roth

Approximately 60 percent of all murder victims in the United States in 1989 (about 12,000 people)—were killed with firearms. According to estimates, firearm attacks injured another 70,000 victims, some of whom were left permanently disabled. In 1985 (the latest year for which data are available), the cost of shootings—either by others, through self-inflicted wounds, or in accidents—was estimated to be more than \$14 billion nationwide for medical care, long-term disability, and premature death. Among firearms, handguns are the murder

weapon of choice. While handguns make up only about one-third of all firearms owned in the United States, they account for 80 percent of all murders committed with firearms.¹

Teenagers and young adults face especially high risks of being murdered with a firearm. Figures for 1990 from the National Center for Health Statistics indicated that 82 percent of all murder victims aged 15 to 19 and 76 percent of victims aged 20 to 24 were killed with guns. The

risk was particularly high for black males in those age ranges. The firearm murder rate was 105.3 per 100,000 black males aged 15 to 19, compared to 9.7 for white males in the same age group. This 11:1 ratio of black to white rates reflects a perplexing increase since 1985, when the firearm murder rate for black males aged 15 to 19 was 37.4 per 100,000. Among 20- to 24-year-old black males, the rate increased from 63.1 to 140.7. For several years before 1985, the rates for black males in these age groups had been

Issues and Findings

Discussed in the Brief: The current status of research and evaluations concerning firearms and violent crime, as reviewed by the National Academy of Sciences Panel on the Understanding and Control of Violent Behavior.

Key issues: Most murders involve firearms, and young minority men are at especially high risk of being murdered with a gun. Innovations in laws, law enforcement, public education, and technology all show promise of reducing gun murders by selectively making firearms less available to persons likely to use them in violence, less accessible in situations where violence is likely to occur, or less lethal. Evaluations are needed to test the effectiveness of these innovations.

Key findings:

◆ Firearms are used in about 60 percent of the murders committed in this country, and attacks by firearms injure thousands of others. The risk of being murdered with a firearm falls disproportionately

on young people, particularly young black men.

◆ Greater gun availability increases the rates of murder and felony gun use, but does not appear to affect general violence levels.

◆ Self-defense is the most commonly cited reason for acquiring a gun, but it is unclear how often these guns are used for self-protection against unprovoked attacks.

◆ According to the latest available data, those who use guns in violent crimes rarely purchase them directly from licensed dealers; most guns used in crime have been stolen or transferred between individuals after the original purchase.

◆ In robberies and assaults, victims are far more likely to die when the perpetrator is armed with a gun than when he or she has another weapon or is unarmed.

◆ Several strategies may succeed in reducing gun murders, but rigorous evaluations are needed to ascertain their effectiveness. Among these are reducing firearm lethality (e.g., by banning certain

types of ammunition), reducing unauthorized use (e.g., through combination locks on triggers, or sentence enhancements for burglary and fencing violations that involve guns), and educating the public about safe use and storage.

◆ Evaluation findings indicate that the following kinds of laws can reduce gun murder rates when they are enforced: prohibitions on carrying concealed weapons, extending sentences for robbery and assault when a gun is used, and restrictive licensing requirements for handgun ownership.

◆ Where there is local support, priority should be given to three enforcement objectives: disrupting illegal gun markets; reducing juveniles' access to guns; and close cooperation between the police and the community to set priorities and enforce laws, in order to reduce the fears that lead to gun ownership for self-defense.

Target audience: Federal, State, and local government policymakers, law enforcement practitioners, and community organizations.

Panel on the Understanding and Control of Violent Behavior

Violence is universally recognized as a pervasive part of contemporary American society and of our Nation's past as well. Many of the attempts to understand the phenomenon have been made in response to specific situations, such as the lawlessness of the Prohibition era, the assassination of President John F. Kennedy, and the urban riots of the mid-1960's. Other attempts at understanding violence singled out particular causes for analysis. In none of these studies, however, was the full body of research on violence reviewed comprehensively, and none of them took an interdisciplinary approach.

The Panel on the Understanding and Control of Violent Behavior was set up to meet the need for a more comprehensive assessment of what is known about violent behavior. It was established in response to a request made by three Federal agencies: the National Science Foundation (NSF), the National Institute of Justice (NIJ), and the Centers for Disease Control and Prevention (CDC). NSF asked for a review of current knowledge about the causes of violent behavior and recommendations for future research. The other two agencies shared these goals, but their areas of interest reflected their particular missions. As the research arm of the U.S. Department of Justice, NIJ wanted to find out about means to prevent and control violent crime. The CDC wanted assistance in setting priorities for preventing injuries and deaths caused by violence.

Created in 1989, the panel reviewed research on "interpersonal violence"—events involving at most a few perpetrators and victims. This limitation excluded suicide and self-mutilation as well as large-scale collective and State violence. The focus was on describing, understanding, and controlling violence in the United States. Research in biomedical, psychological, and other social

sciences was reviewed. The work of the panel was intended both to help guide future research and evaluation projects aimed at prevention and control and to suggest strategic directions for violence control policy.

The findings, conclusions, and recommendations of the panel were published in Volume 1 of *Understanding and Preventing Violence*, published by the National Academy Press. Three volumes of background papers commissioned by the panel are forthcoming. The panel concluded that numerous, often interacting factors give rise to violent events. Although the underlying interactions are not well understood, attention to the factors suggests many promising preventive interventions. Testing and evaluating these interventions creates opportunities to prevent particular types of violence while gaining better understanding of them. The panel made recommendations in a number of areas, among them development of problem-solving initiatives to control and understand violence; better statistical systems for measuring violence; and a program of research to identify underlying causes. This Research in Brief is one of a series that summarizes the panel's findings.

NIJ is committed to implementing the recommendations of the panel. Its commitment has begun through support for the Program on Human Development and Criminal Behavior, a longitudinal, multi-community research project that is exploring the factors associated with violence. In addition, the panel's recommendations have helped shape the goals of NIJ research and evaluation activities and its long-range plans for research.

Copies of *Understanding and Preventing Violence* are available from the National Academy Press, 2101 Constitution Avenue N.W., Washington, DC 20418 (800-624-6242).

decreasing. The recent increases have not been paralleled for females, whites, or older black males, nor have they been matched in non-gun murder rates or even firearm suicide rates for young black males. (The latter are higher among whites than among blacks but have risen recently for both races.)²

For these reasons, the Panel on the Understanding and Control of Violent Behavior devoted substantial attention to issues surrounding firearms and violence, relying on a commissioned background paper,³ critical commentary on a draft of that paper, and its own review of published research literature. This report summarizes the panel's conclusions.

Research findings

Any firearm murder follows a particular chain of events: One person acquires a firearm; two or more people come within reach of the firearm; a dispute escalates into an attack, the weapon is fired; it causes an injury; and the injury is serious enough to cause death. While that sequence probably seems obvious, thinking about gun murders as a chain of events draws attention to a series of risks that should be measured and questions that should be considered in designing strategies to reduce murders or other violent events that involve guns.

Some potentially useful distinctions should be made at the outset:

1. *Availability* of guns refers to the overall number of guns in society and the ease of obtaining them.
2. *Possession* of a gun simply means ownership, regardless of how the weapon is stored, carried, or used.
3. *Access* to a gun as a weapon of violence means its immediate availability at the site of a violent event and depends on how the gun is stored or carried.
4. *Allocation* of guns refers to the distribution of gun possession among people who have and people who have not demonstrated high potentials for violent behavior.

5. *Lethality* of guns or other weapons means the likelihood that a person injured by the weapon will die as a result.

Each of these distinctions raises specific issues about the relationship of guns to violence.

How is gun availability related to violence levels?

Speculation about the relationship between gun availability and violence levels takes two directions. On one hand, greater availability of guns may deter some potential perpetrators of violent crimes out of fear that the intended victim may be armed. On the other hand, greater availability of guns may encourage people who are contemplating committing a violent crime to carry it out but first to arm themselves to overcome their fear of retaliation. Greater gun availability may also increase violence levels if guns kept at home or in cars are stolen during burglaries, enter illegal markets, and encourage criminals to attack victims they would pass up without being armed. Guns kept in homes may also be used in family arguments that might have ended nonviolently if guns were not available.

How are these conflicting speculations resolved in actual practice? The best way to answer this question would be to measure violent crime levels before and after an intervention that substantially reduced gun availability. However, opportunities to evaluate the effects of such interventions have arisen in only a few jurisdictions. (The results are discussed, along with those of other evaluations, on pages 5 and 6.)

Because evaluation opportunities have been rare, researchers have used four less powerful approaches to study how gun availability affects violence and its consequences. The findings, while somewhat tentative and not entirely consistent, suggest that greater gun availability increases murder rates and influences the choice of weapon in violent crimes, but does not affect overall levels of nonfatal violence.

The first research approach asks how differences in violence across American cities

are related to variations in gun availability, controlling for other relevant factors.

These studies generally find small positive correlations between measures of gun availability and both felony gun use and felony murder. However, they find no consistent relationship between gun availability and overall rates of violent crime.

The second approach used was a comparison of two jurisdictions. The neighboring cities of Seattle and Vancouver have similar economic profiles and were found to have similar rates of burglary and assault. However, Seattle, with its less restrictive gun possession laws, had a 60 percent higher homicide rate and a 400 percent higher firearm homicide rate than Vancouver. It is not clear whether the differences in gun laws accounted for all the variation between the two cities in homicide rates, or whether differences in culture were also contributing factors.

The third approach relies on cross-national statistical comparisons. These studies have generally reached one of the conclusions found in studies of American cities: a small positive correlation between gun availability and homicide rates. The finding is difficult to interpret, however, in view of differences by country in culture and in gun regulations. For example, murder rates are low in Switzerland, where militia requirements make possession of long guns by males nearly universal. This seems to suggest there is no positive correlation between gun availability and murder rates. But this interpretation is clouded because in Switzerland access to guns is limited: militia members are required to keep their guns locked up and to account for every bullet.

The fourth approach relies on analyses of trends over time. Studies using this method have found no correlations between gun availability and rates of violent crime. But trends are subject to a variety of influences, which may mask a relationship that would emerge in the aftermath of some new law or other intervention that substantially reduced gun availability. Evaluation findings about such interventions are discussed later in this report, but more such

evaluations are needed to obtain better answers to this question.

How do people obtain possession of guns they use in violent crime?

Although available data on how guns are obtained are fragmented, outdated, and subject to sampling bias, they suggest that illegal or unregulated transactions are the primary sources of guns used in violence. For example, only 29 percent of 113 guns used in felonies committed in Boston during 1975 and 1976 were bought directly from federally licensed dealers (27 of the 29 percent were obtained by legally eligible purchasers). Between the manufacturer and the criminal user, 20 percent of the guns passed through a chain of unregulated private transfers, while 40 percent were stolen. Most of the illegal suppliers found in this sample were small-scale independent operators who sold only a few guns per month, rather than large organizations or licensed dealers working largely off the books.⁴

More recent data were available on how incarcerated felons in 10 States obtained the guns they used in committing crime. The figures revealed that in 1982 only 16 percent of those who used guns in criminal activities reported buying them from licensed dealers. Twice as many (32 percent) reported stealing the gun, and the rest borrowed or bought it from friends or acquaintances. Thefts and illegal purchases were not surprisingly most common among the incarcerated felons who said they acquired their guns primarily to commit crimes.⁵

More up-to-date information on how juveniles obtain guns will be available in the forthcoming report of a study sponsored by NIJ.⁶ The researchers studied samples of juveniles who were imprisoned for serious violent crime and students who attended inner-city high schools.

How does gun access affect the consequences of violent events?

Researchers have studied how the presence of a gun affects the consequences of two types of violent crime—personal robbery and assault. Both types of crime may begin

with a threat to use violence. Studies have examined how the likelihood of three outcomes of the threat—escalation to an actual attack, to injury, and to death—changes if the robber or assaulter posing the threat is armed with a gun.

A study of personal robberies revealed that escalation from threat to attack is *less likely* if the robber is armed with a gun than if he or she is unarmed.⁷ A similar pattern was found in assaults.⁸ Perhaps the reason is that robbers armed with guns are less nervous, or victims confronted with guns are too frightened to resist, or both. Either effect could reduce the risk of escalation from threat to attack.

One implication of the lower escalation rate when guns are used is that robbery and assault victims are less likely to be injured when the perpetrator has a gun. When data reported through the National Crime Victimization Survey (NCVS) between 1973 and 1982 are combined, they reveal that among victims who survive attacks, the chance of injury was 14 percent when the offender was armed with a gun. It was higher when a gun was not used—25 percent when the offender was armed with a knife, 30 percent when unarmed, and 45 percent when armed with another weapon.⁹

How does gun use affect the chance that a violent crime will end in the victim's death?

The overall fatality rate in gun robberies is an estimated 4 per 1,000—about 3 times the rate for knife robberies, 10 times the rate for robberies with other weapons, and 20 times the rate for robberies by unarmed offenders.¹⁰ For assaults, a crime which includes threats, the most widely cited estimate of the fatality rate is derived from a 1968 analysis of assaults and homicides committed in Chicago. The study, prepared for the National Commission on the Causes and Prevention of Violence, reported that gun attacks kill 12.2 percent of their intended victims. This is about 5 times as often as in attacks with knives, the second most deadly weapon used in violent crimes.¹¹ With one exception, more recent studies have generally concluded

that death was at least twice as likely in gun assaults as in knife assaults.¹²

While researchers who have looked at the question generally concur that victims injured by guns are more likely to die than victims injured by other weapons, an important question remains: how much of this greater lethality reflects properties of the gun, and how much reflects greater determination to kill by those who choose guns over other weapons for their violent acts? The question is significant for public policy because even the removal of all guns from society would not prevent homicides if the greater lethality of gun injuries were due entirely to violent gun users' greater determination. They would simply achieve their goal using other weapons.

The relative importance of weapon type and user determination in affecting the deadliness of gun attacks has not been definitively established because researchers cannot directly measure user determination. Indirect measures indicate that firearms are sometimes fired at people without a premeditated intent to kill. The question is how often? If the motivations of gun murderers and knife murderers systematically differed, then systematic differences in the surrounding circumstances would be expected. In fact, however, the gun and knife murders in the 1968 Chicago sample occurred under similar circumstances—largely arguments in which alcohol and temporary rage, not single-minded intent, were most likely to have influenced the killer's behavior. More than 80 percent of gun victims in the sample received only a single wound, a finding which suggests that killers and assaulters who used guns failed to use the full capabilities of their guns to achieve the goal of killing.¹³ The interpretation of these statistics has been questioned on methodological grounds, however; and, in any event, the interactions among circumstances, motivation, and weapon choice in murder may well have changed since 1968.

The study of personal robberies, discussed above, suggests at least one reason other than lethal intentions why some robbers

use guns: to enable them to attack certain types of victims, such as businesses and groups of teenage males, who would otherwise be relatively invulnerable. Guns are used more often to rob these types of victims than to rob women and the elderly, who are considered more vulnerable. Serial killers are considered the most intent of all killers, but they have rarely used guns. People who killed in violent family fights seem unlikely to have carefully considered their weapon choices; more likely, they resorted to the nearest available weapon, including hands or feet. Even among incarcerated felons, those interviewed in the 10-State survey cited above, 76 percent of those who fired guns in criminal situations claimed to have had no prior intention of doing so.¹⁴

These observations and findings strongly suggest that properties of weapons, rather than intentions of attackers, account for at least some of the difference in lethality between guns and other weapons. However, the apportionment is not precise, and questions have been raised about the methodologies used in the studies.¹⁵ Measuring more precisely how much of the lethality difference arises from different intentions rather than from the choice of a gun remains a problem for future research.

Does use of a gun in self-defense reduce the injury risk of violent events?

Self-defense is commonly cited as a reason to own a gun. This is the explanation given by 20 percent of all gun owners and 40 percent of all handgun owners contacted for a household survey conducted in 1979.¹⁶ Just how often potential victims of violence defend themselves with guns is unclear, in part because "self-defense" is a vague term. Among a sample of prisoners, 48 percent of those who fired their guns while committing crimes claimed they did so in self-defense. At a minimum, victims use guns to attack or threaten the perpetrators in about 1 percent of robberies and assaults—about 70,000 times per year—according to NCVS data for recent years. These victims were less likely to report being injured than those who either defended themselves by other means or took no self-protective measures at all. Thus, while 33 percent of all surviving

robbery victims were injured, only 25 percent of those who offered no resistance and 17 percent of those who defended themselves with guns were injured. For surviving assault victims, the corresponding injury rates were, respectively, 30 percent, 27 percent, and 12 percent.¹⁷

For two reasons, these statistics are an insufficient basis for the personal decision whether or not to obtain a gun for self-protection. First, the decision involves a trade-off between the risks of gun accidents and violent victimization. Second, it is not entirely clear that the relatively few robberies and assaults in which victims defended themselves with guns are typical of these types of crimes and that the lower injury rates resulted from the self-defense action rather than some other factor. Perhaps offenders lost the advantage of surprise, which allowed victims not only to deploy their guns but also to take other evasive action. More detailed analysis of gun self-defense cases is needed to measure both the frequency and consequences of different self-defense actions using guns.

Policy implications

Currently, firearm sales and uses are subject to Federal, State, and local regulations that are intended to reduce gun-related criminal activity. The Federal Gun Control Act of 1968 is intended to control the *allocation* of guns by requiring that dealers obtain Federal licenses; by prohibiting them from selling guns through the mail or across State lines to anyone except other licensed dealers; and by barring sales to high-risk-category individuals such as minors, felons, and drug users. According to the U.S. General Accounting Office, resources available to enforce the Act declined during the 1980's, and the news media have reported instances of convicted felons and active drug dealers obtaining Federal dealers' licenses that have permitted them to purchase guns in large quantities.

Changing the allocation of guns from high-risk to low-risk individuals is one of four strategies that have been attempted to reduce gun-related violent crimes. To

Table 1. Evaluation Status of Strategies and Interventions for Reducing Gun Violence

Strategy and Intervention	Evaluated?	Effective?
Strategy 1: Alter gun uses or storage		
Place and manner laws		
Restrict carrying		
Bartley-Fox Amendment	Yes	Yes
Enhance sentences for felony gun use		
Michigan	Yes	Partial*
Pennsylvania	Yes	Partial*
Increase probability of sentences for felony gun use		
Operation Triggerlock	No	?
Civil/administrative laws		
Owner liability for damage by gun	No	?
Technological		
Enhance/maintain firearm detectability	No	?
Metal detectors in dangerous places	No	?
Enhance visibility of dangerous illegal uses	No	?
Shields for vulnerable employees	No	?
Public education		
Safe use and storage	No	?
Role in self-defense	Yes	?
Strategy 2: Change gun allocation		
Civil/administrative laws		
Permissive licensing of owners (e.g., all but felons, drug users, minors, etc.)	No	?
Waiting periods for gun purchases	No	?
Restrict sales to high-risk purchasers		
Gun Control Act of 1968	Yes	No
Law enforcement		
Disrupt illegal gun markets	No	?
Mandatory minimum sentences for gun theft	No	?
Technological		
Combination locks on guns	No	?
Strategy 3: Reduce gun lethality		
Protective clothing in dangerous encounter	No	?
Reduce barrel length and bore	No	?
Reduce magazine size	No	?
Ban dangerous ammunition	No	?
Strategy 4: Reduce gun availability		
Restrictive licensing systems		
D.C. Firearms Control Act of 1977	Yes	Yes
Restrict imports	No	?
Prohibit ownership	No	?

*Reduced gun homicides, no consistent effect on gun robberies, gun assaults, or non-gun homicides.

reduce high-risk *uses* of guns, some States have enacted "place and manner" laws to prevent carrying or concealing guns in public, or to enhance sentences for felonies in which guns are used. Other legal strategies are intended to reduce the *availability* of guns through restrictive licensing that permits only selected categories of people (such as police and private security officers) to possess guns. Legally required waiting periods for gun purchases are intended both to facilitate verification that purchasers belong to the permitted categories and to reduce "impulse buying" by people who may have temporary violent intentions.

Some States have attempted to reduce the *lethality* of available weapons by banning sales of certain categories of weapons used in violent crimes. These categories include concealable "Saturday night specials" or high-capacity "assault weapons," both of which have proven difficult to define in practice.

The high lethality of gun injuries and the heavy involvement of guns in murder have prompted an intense public debate and a search for strategies to reduce gun homicides. Legal, technological, and public education approaches may all have roles to play. (Table 1 lists these within the categories of the four strategies.) However, the effectiveness of any of these strategies in reducing gun murders depends on the strength of two influences that counteract each other:

- The behavioral response—the extent to which people behave in ways that reduce the level or severity of gun violence because of newly available protective technology, public education campaigns, or the threat of legal punishment.
- Substitution effects—the extent to which the desired behavioral responses are offset by high-risk behaviors such as use of more lethal guns, disarming of gun combination locks by gun thieves, or the assignment by drug organizations of juveniles to gun-using roles because they are subject to lighter penalties than adults.

Because the strength of these two effects cannot be predicted in advance, evaluation is needed to identify the effects of any of

the four types of strategies/interventions. Most of them have not been evaluated, and some of the evaluations have produced unclear results. (See Table 1.) However, studies of the four strategies have yielded some valuable information:

● **Strategy 1: Alter gun uses.** Both "place and manner" laws and sentence enhancements for felony gun use have been shown to be effective in States (Michigan and Pennsylvania) where they have been evaluated. But neither legal approaches (such as making owners or manufacturers liable for damages caused by the gun) nor technological approaches that make guns and their illegal uses more visible have been evaluated. Some public education initiatives have been evaluated, but the findings have been called into question because of measurement problems.

● **Strategy 2: Change gun allocation.** An evaluation of the effect of the Federal Gun Control Act of 1968 was conducted in two States where restrictions against in-state purchases should make interstate trafficking the major source of guns used in crime. The evaluation did not find that the Act reduced gun use in assaults or homicides. However, a later evaluation of a crackdown to enforce the Federal law in the District of Columbia did show a 6-month reduction in gun homicides. Neither technological innovations, such as built-in combination locks that permit only the legal owner to fire the gun, nor law enforcement approaches, such as disruption of illegal gun markets or mandatory minimum sentences for gun theft, have been evaluated.

● **Strategy 3: Reduce gun lethality.** Neither legal nor technical restrictions that would reduce gun lethality have been evaluated.

● **Strategy 4: Reduce gun availability.** The results of several evaluations indicated that the 1977 District of Columbia Firearms Control Act, which prohibited handgun ownership by virtually all private citizens, reduced gun robberies, assaults, and homicides for several years. More intrusive legal restrictions on imports, manufacture, or ownership have not been evaluated.

The following evaluation findings are especially significant:

● The Massachusetts 1974 Bartley-Fox Amendment, which prescribed a 1-year sentence for unlicensed public carrying of firearms, decreased gun assaults, gun robberies, and gun homicides during the 2-year period in which it was evaluated.

● Several State mandatory add-ons to felony sentences for use of a gun have reduced gun homicides, but whether they have discouraged gun use in robberies and assaults is not clear.

● The decrease in Washington, D.C., gun homicides following passage of the 1977 D.C. Firearms Control Act appears to have been maintained until the mid-1980's when, according to a recent study, the rise of crack markets was accompanied by a substantial increase in gun homicides.¹⁸

● The 1968 Federal Gun Control Act, which prohibited Federally licensed gun dealers from selling guns to certain designated "dangerous" categories of people, failed to reduce firearm injuries or deaths, apparently because of lax enforcement.

Evaluations of firearm laws suggest that enforcement is critical to their effectiveness. Therefore, while public debate continues over the wisdom of enacting new gun laws, the Panel concluded that priority should be given to three aspects of enforcing existing laws:

● Disrupting illegal gun markets by means of undercover buys, sting operations, and other tactics at the wholesale and retail levels.

● Reducing juveniles' access to guns through better enforcement of the Federal ban on gun dealers' sales to minors and through disruption of the illegal or unregulated channels through which juveniles obtain guns.

● Close police-community cooperation in setting priorities and enforcing gun laws, as a means of reducing the fears that lead to gun ownership for self-defense.

Long-term efforts are needed to design and implement these and other enforcement tactics so they are both effective and acceptable to the local community; to test them in carefully controlled evaluations; to

refine them as indicated by the evaluation findings; and to replicate the evaluations in different community settings.

Notes

1. Confusion frequently arises in discussions of firearms (a generic term equivalent to "guns") used in violence because of inconsistencies between legal and popular classifications of firearms. The Code of Federal Regulations governing firearms distinguishes between rifles, shotguns, and handguns. Rifles are designed to fire solid bullets, and shotguns are commonly used to fire shells that contain small pellets, called "shot." Rifles and shotguns are frequently grouped together as "long guns," a term referring to their design, which generally requires that the user fire from the shoulder. Long guns may be shortened by sawing off the barrel, which makes them easier to conceal for use in crime. Handguns include pistols and revolvers designed to be fired with one hand. No Federal regulations require registration of handguns or long guns that shoot only one bullet or shell with each squeeze of the trigger; most such guns require reloading after six shots at most. Federal registration and taxes are required to own a machinegun, a weapon that can be made to shoot "automatically" (more than once) by holding the trigger in a squeezed position. Ammunition clips holding many bullets can be attached to machineguns or "semi-automatic" pistols and rifles (that is, weapons designed to accept ammunition clips, many of which can be converted to fire automatically), allowing them to fire 15 or 32 shots without reloading. Such weapons are sometimes popularly called "assault weapons," a term that has no precise definition.

2. Fingerhut, Lois A., "Firearm Mortality Among Children, Youth, and Young Adults 1-34 Years of Age, Trends and Current Status: United States, 1985-1990," National Center for Health Statistics, *Advance Data*, 231, March 23, 1993. The article contains additional details of firearms mortality. Unpublished data from the National Center for Health Statistics indicate that in 1991 the firearm homicide rate increased still further, to 123.6 per 100,000 black males aged 15 to 19 and to 164.4 per 100,000 for those aged 20 to 24. These data were not available when the panel study was conducted.

3. Cook, Philip J., "The Technology of Personal Violence." In M. Tonry, ed., *Crime and Justice*, Volume 14. Chicago and London: University of Chicago Press, 1991.

4. Moore, Mark H., "Keeping Handguns From Criminal Offenders," *The Annals of the American Academy of Political and Social Science*, 455 (1981):92-109.

5. Wright, James D., P.H. Rossi, and K. Daly, *The Armed Criminal in America: A Survey of Incarcerated Felons*, National Institute of Justice Research Report, Washington, D.C.: National Institute of Justice, 1983.

6. Sheley, Joseph F., and James D. Wright, *Gun Acquisition and Possession in Selected Juvenile Samples*, Research in Brief, Washington, D.C.: U.S. Department of Justice, National Institute of Justice, forthcoming.

7. Cook, Philip J., "Reducing Injury and Death Rates in Robbery," *Policy Analysis* 6(1) (1980):21-45. The study focus was personal robberies reported in the National Crime Victimization Survey.

8. Kleck, Gary, and Karen McElrath, "The Effects of Weaponry on Human Violence," *Social Forces*, 69(3) (1991):1-21. This study also used data from the National Crime Victimization Survey.

9. Bureau of Justice Statistics, *The Use of Weapons in Committing Crimes*, Washington, D.C.: U.S. Department of Justice, Bureau of Justice Statistics, 1986.

10. Cook, Philip J., "Robbery Violence," *Journal of Criminal Law and Criminology*, 78(2) (1987):357-376.

11. Newton, G.D., and F.E. Zimring, *Firearms and Violence in American Life: A Staff Report Submitted to the National Commission on the Causes and Prevention of Violence*, Washington, D.C.: National Commission on the Causes and Prevention of Violence, 1969.

12. The exception is Kleck and McElrath, "The Effects of Weaponry on Human Violence."

13. Zimring, Frank E., "Is Gun Control Likely to Reduce Violent Killings?" *The University of Chicago Law Review*, 35 (1968):721-737.

14. Wright, J.D., P.H. Rossi, and K. Daly, *Under the Gun: Weapons, Crime, and Violence in America*, Hawthorne, New York: Aldine Publishing Company, 1983:15.

15. See, for example, Wright, Rossi, and Daly, *Under the Gun: Weapons, Crime, and Violence in America*.

16. Decision-Making Information, Inc., *Attitudes of the American Electorate Toward Gun Control*, Santa Ana, California: Decision-Making Information, Inc., 1979.

17. Kleck, Gary, "Crime Control through the Private Use of Armed Force," *Social Forces*, 35 (1988):1-22. See Table 4, p. 8.

18. Loftin, C., D. McDowall, B. Wiersema, and T. J. Cottey, "Effects of Restrictive Licensing of Handguns on Homicide and Suicide in the District of Columbia," *New England Journal of Medicine*, 325 (December 1991): 1615-1620.

Opinions or points of view expressed in this document are those of the author and do not necessarily reflect the official position or policies of the U.S. Department of Justice.

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