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The Great American Gun War: Notes from Four Decades in the Trenches

ABSTRACT

In this essay I provide an account of how research on gun violence has evolved over the last four decades, intertwined with personal observations and commentary on my contributions. It begins with a sketch of the twentieth century history of gun control in the United States. I then provide an account of why gun violence is worth studying, with a discussion of how and why the type of weapon used in crime matters, and assess the social costs of the widespread private ownership of firearms. I then detour into the methodological disputes over estimating basic facts relevant to understanding gun use and misuse. In Section IV, I focus on how gun availability influences the use of guns in crime and whether the incidence of misuse is influenced by the prevalence of gun ownership, regulations, and law enforcement. I go on to review evaluations of efforts to focus law enforcement directly at gun use in violent crime. Next I turn to the hottest topic of our day, the role of guns in self-defense and what might be deemed private deterrence. The conclusion summarizes the claims and counterclaims concerning gun regulation and asks, finally, if there is the possibility of an influential role for scientific research in the policy debate.

In 1976, the year I published my first research on gun violence, *The Public Interest* ran an article that should have served as a warning. Titled “The Great American Gun War,” the author asserted that “no policy

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research worthy of the name has been done on the issue of gun control. The few attempts at serious work are of marginal competence at best, and tainted by obvious bias. Indeed, the gun control debate has been conducted at a level of propaganda more appropriate to social warfare than to democratic discourse” (Bruce-Briggs 1976, p. 37).

In the years since, the quality of the public debate has kept its “incredible virulence” and intensity, but the research drought has long since ended.¹ Criminologists, economists, public health scholars, and policy scientists have all made substantive contributions. Unfortunately, it is not clear that this research has improved the quality of the debate or of policy making. The research results that have obtained greatest visibility and public influence are not necessarily those that stand up well to scientific review and replication, but rather those that serve powerful ideological interests. In short, gun violence serves as a challenge to the very possibility of evidence-based policy making in a contentious arena. After nearly four decades in the academic trenches of this “war,” I remain convinced that dispassionate research has much to offer in designing cost-effective policy. But it is all too rare that there is a quiet forum available for that discussion.

There have been two “fronts” in the gun war. The first is the primary domain of the social scientists who investigate the interconnections between guns and crime using available data and standard statistical methods. For example, the question of whether authorizing more people to carry guns in public will lead to a reduction or increase in crime is in principle a subject for scientific inquiry with a correct answer that may be discoverable from systematic analysis of data. The second front is the analysis of the “true” meaning of the Second Amendment to the US Constitution, to wit: “A well regulated militia, being necessary to the security of a free state, the right of the people to keep and bear arms, shall not be infringed.” Arguments about the proper interpretation of this brief but obscure statement have engaged numerous legal scholars, historians, and grammarians, with little input from social science.

It is fair to say that these days the pro-gun side has the upper hand

¹ Actually, Bruce-Briggs was too negative about the state of research in 1976. By then Franklin Zimring had published a series of articles and a monograph that have stood up well to the test of time: see Zimring (1968, 1972, 1975) and Newton and Zimring (1971). But one can marvel that criminologists did not take a greater interest in gun violence in the 1960s and 1970s, a time in which the epidemic of violent crime that began in 1963 was eroding the quality of life in many American cities.

on both fronts. In 2008, in *District of Columbia v. Heller*, 554 US 570 (2008), the US Supreme Court asserted for the first time that there is a personal right to “keep and bear arms,” a right that serves as a limit to gun regulation in the federal arena; in *McDonald v. City of Chicago*, 561 US 3025 (2010), the Court extended this right to the state and local arena. The situation is less clear on the first (empirical) front, but I believe that the pro-gun drift in public opinion and public discourse owes a great deal to research claiming that there are millions of instances each year in which guns are used in self-defense and that widespread gun carrying for self-defense purposes has a deterrent effect on all sorts of street crime. Whether these claims are correct or not, they are embraced and heavily promoted by pro-gun advocates. John Lott’s (1998) book *More Guns, Less Crime* is the University of Chicago Press’s best seller of all time. Contrary findings by reputable scholars have had less traction in the public arena (Ayres and Donohue 2009). Furthermore, research that would likely point to the hazards of gun ownership has been undercut by lack of funding; the pro-gun advocates were able to use their extraordinary influence with Congress to discourage federal research funding for investigation of the public health effects of private gun possession.²

Viewed in this political context, much of my research has had the effect of supporting the positions of the losing side. While it has not been my intent to promote one side or the other, my findings have helped to make the case for the importance of reducing gun use in violent crime while calling into question the value of private guns as a deterrent or effective tool of self-defense. Indeed, one clear conclusion supported by my research dating back to the 1970s could be summarized as “more guns, more homicide.” Much of my career with gun research has been on the defensive, responding to far-fetched claims by legal scholars, criminologists, and economists. I consider the following examples far-fetched:

- The type of weapon used in criminal assault has little effect on the likelihood that the victim is killed.

² The Centers for Disease Control and Prevention (CDC) funded some extramural research on gun violence that helped establish that gun ownership had a detrimental effect on the public health and that private possession of guns increased the likelihood that a household member would be shot or killed. Congress responded by redirecting the funds used to fund this research program and barring the CDC from using federal funds to advocate or promote gun control (see Mair, Teret, and Frattaroli 2005; Goss 2006).

- Guns are so plentiful in the United States that they are as readily available to youths and criminals as hamburgers.
- There are millions of defensive gun uses each year, and defensive uses vastly outnumber criminal uses of guns.
- Increasing the number of guns on the street or in homes has a large deterrent effect on all sorts of crime.
- Only criminals misuse guns, and they are either readily identified or unaffected by gun regulations.

Of course scientists make mistaken claims all the time; the beauty of the scientific process is that when there is an open inquiry on important topics, mistakes are ultimately exposed and corrected, and a scientific consensus is achieved. The belief in that self-correcting scientific process underlies the hope for evidence-based policy. That hope may be misplaced when the scientific process is entwined with the process of political advocacy, where findings are in effect evaluated by whose purposes are served.

Of course, social scientists do not normally evaluate research by its influence on policy or public opinion, but rather by its contribution to scholarly knowledge as judged by academic peers. I have had the opportunity to work on a number of research projects that, while pertaining to gun violence, have broader methodological lessons. For example, my coauthors and I have helped uncover and document some previously unknown limitations of sample surveys. In particular, we found that even high-quality surveys have large biases in estimating the prevalence of gun ownership, the incidence of gunshot wounds in assaults, and the frequency with which guns are used in self-defense. The sources of bias appear to be different in each case, but the common element is unexpectedly large error that should encourage skepticism of a variety of survey results in other domains as well. In other methodological contributions, we created the first crime application of the contingent-valuation method, demonstrated that market frictions (in the underground gun market) can be investigated through a combination of ethnographic and econometric methods, and demonstrated the power of the “limited rationality” perspective in characterizing the choices made by robbers. All of this is to say that our research program in this particular applied area of social science is not just a consumer of social science methods but also a producer (or critic) and hence is of broader scientific interest. But the policy-advocacy context is ines-

capably important. It has had great influence on our research agenda and on the public reception of findings.

In this essay I have attempted to provide an account of how research on gun violence has evolved over the last four decades, intertwined with personal observations and more commentary on my own contributions than modesty would ordinarily permit. It is, to borrow a current phrase, a “hybrid vehicle.” For anyone seeking a more straight-ahead review of the literature, I can suggest (having already given up on modesty) Cook and Ludwig (2006*a*, 2006*b*) or Cook, Braga, and Moore (2010).

The rather twisty road that I navigate with this hybrid vehicle can be briefly mapped. I begin with a sketch of the twentieth-century history of gun control in the United States, simply because gun policy and debates over gun policy form such an important context for research on gun violence. Section II then provides an account of why gun violence is worth studying, with a discussion of how and why the type of weapon used in crime matters, and assesses the social costs of the widespread private ownership of firearms. Section III is a bit of a detour into the methodological disputes over estimating basic facts relevant to understanding gun use and misuse. In Section IV, I focus on how gun availability influences the use of guns in crime and whether the incidence of misuse is influenced by the prevalence of gun ownership, regulations, and law enforcement. Section V looks at evaluations of efforts to focus law enforcement efforts directly at gun use in violent crime. Section VI then turns to the hottest topic of our day, the role of guns in self-defense and what might be deemed private deterrence. Section VII, unlike my research career in this area, concludes the essay.

I. Regulation of Firearms in the Twentieth Century

Compared to other developed nations, the United States is lax in regulating firearms. Nonetheless, there is some nontrivial regulation of the design, possession, transfer, and use of firearms. A teenager shooting squirrels with a sawed-off shotgun in New York’s Central Park would be in violation of a number of local, state, and federal laws.

Table 1 summarizes the sequence of prominent federal laws and litigation, coupled with comments on the trends in criminal violence of the time. Congress first got into this arena during the Prohibition Era

TABLE 1
Time Line of Federal Gun Policy

Era	Crime Patterns	Federal Crime Policy Innovations
1920s	Prohibition-related gang violence Tommy gun era	1919: federal excise tax on handguns (10%) and long guns (11%) 1927: handgun shipments banned from the US mail
1930s	End of Prohibition in 1933 Declining violence rates	1934: National Firearms Act: requires registration and high transfer tax on fully automatic weapons and other gangster weapons 1938: Federal Firearms Act: requires anyone in the business of shipping and selling guns to obtain a federal license and record names of purchasers
1960s	Crime begins steep climb in 1963 with Vietnam era and heroin epidemic Assassinations Urban riots	1968: Gun Control Act: bans mail-order shipments except between federally licensed dealers (FFLs); strengthens licensing and record-keeping requirements Limits purchases to in-state or neighboring-state residents Defines categories of people (felons, children, etc.) who are banned from possession Bans import of "Saturday night specials"
1970s	Violence rates peak in 1975 (heroin) and again in 1980 (powder cocaine era)	1972: Bureau of Alcohol, Tobacco and Firearms (ATF) created and located in the US Department of Treasury
1980s	Epidemic of youth violence begins in 1984 with introduction of crack	1986: Firearm Owners Protection Act: eases restrictions on in-person purchases of firearms by people from out of state Limits FFL inspections by ATF and bans the maintenance of some databases on gun transfers Ends manufacture of National Firearm Act weapons for civilian use
1990s	Violence rates peak in early 1990s, begin to subside School rampage shootings	1994: Brady Handgun Violence Prevention Act: requires licensed dealers to perform a criminal background check on each customer before transferring a firearm 1994: Partial ban on manufacture of "assault" weapons and large magazines for civilian use 1996: Congress bans the CDC from promoting gun control and effectively stops the CDC from funding research on gun violence

TABLE 1 (*Continued*)

Era	Crime Patterns	Federal Crime Policy Innovations
2000s	Crime and violence continue to decline	1996: Lautenberg Amendment bans possession by those convicted of misdemeanor domestic violence 2004: Assault weapons ban is allowed to sunset 2005: Congress immunizes firearms industry against civil suits in cases in which a gun was used in crime 2008: <i>District of Columbia v. Heller</i> for the first time establishes personal right under the Second Amendment

and its associated gang violence. The federal excise tax on guns was imposed in 1919 primarily for revenue purposes (although the sumptuary aspects were noted in the congressional debate). In 1927, well into the “Roaring Twenties,” a ban was imposed on the use of the US mail to ship handguns. The focus on particular types of guns continued with the National Firearms Act of 1934, which required owners of fully automatic weapons (machine guns), sawed-off shotguns, and other weapons famously used by gangsters to register these weapons with the federal authorities. All transfers were subjected to a tax of \$200, which at the time was confiscatory.³ There is some indication that this law has been effective: the use of fully automatic weapons in crime appears to be quite rare in modern times.⁴

The most important federal legislation was not enacted until 1968, following a surge in crime, urban riots, and political assassinations (Zimring 1975). Building on the precedent of the Federal Firearms Act of 1938, the Gun Control Act (GCA) strengthened federal licensing of firearms dealers and limited interstate shipments of guns to licensees. The goal was to protect states that opted for tighter regulation against inflows of guns from states with lax regulations. In particular, the GCA banned mail-order shipments of the sort that supplied Lee Harvey Oswald with the gun he used to assassinate President Kennedy.

³ It was not until 1986 that Congress banned the manufacture of National Firearms Act weapons for civilian use.

⁴ Gary Kleck (1991) offers some evidence in *Point Blank* and notes that “although, oddly enough, gun control advocates rarely mention it, the *de facto* federal machine gun ban in place since 1934 may well be an example of a successful gun control effort” (p. 70).

The GCA also established a federal prohibition on possession by certain categories of people deemed dangerous because of their criminal record, drug abuse, mental illness, or youth. “Felon in possession” thus became a federal offense, which helped create the possibility of a partnership between local prosecutors and US attorneys in combating violent crime. The GCA’s record-keeping requirements assisted law enforcement agencies in tracing guns to their first retail sale, which like felon in possession laws has proven quite useful in documenting interstate trafficking patterns and also in some murder investigations. Finally, the GCA banned the import of foreign-made handguns that were small or low quality and hence did not meet a “sporting purposes” test.

The agency created to do the regulatory enforcement and criminal investigation of gun trafficking is the Bureau of Alcohol, Tobacco, Firearms, and Explosives (ATF). It has been something of a political football since its creation. In 1986 the Firearm Owners Protection Act placed limits on ATF’s ability to inspect dealers and keep records that would help identify suspicious purchasing patterns. But with the surge of violence during the 1980s associated with the introduction of crack cocaine and a shift in the political winds in favor of the Democrats, it became politically possible to strengthen the federal regulatory scheme in one important respect: the Brady Act was adopted in 1994, requiring that every purchase from a federally licensed dealer be preceded by a background check, helping establish a federal “instant check” system that dealers could access. Also in that year, Congress imposed a ban on the manufacture or import of “assault weapons” for civilian use as well as large-capacity magazines.⁵ In 1996, the Lautenberg Amendment expanded the list of people proscribed from possessing a firearm to those who had been convicted of domestic violence, even at the misdemeanor level.

In recent years the federal “action” has shifted from Congress to the courts. Following the success of the state attorneys general in suing the tobacco industry (resulting in the Master Settlement Agreement of 1998),⁶ a number of cities filed suit against the gun industry. These

⁵ That ban was allowed to sunset 10 years later and survives in the laws of only a few states.

⁶ The cause of action against the cigarette manufacturers focused on the costs to the states of paying for treatment of smoking-related illnesses through the Medicaid program. The Master Settlement Agreement was signed by the four largest manufacturers and 46 attorneys general. Among other things it obligated the manufacturers to make annual payments to the states in exchange for some exemption from subsequent liability.

suits employed various theories of mass tort, but with the common goal of using the courts to do what the legislatures would not when it came to regulating the design and marketing of firearms. In 2005, Congress intervened to stop this litigation by taking the extraordinary step of immunizing the gun industry from lawsuits in which the damages had resulted from misuse of a gun (the Protection of Lawful Commerce in Arms Act, PL 109-92). But the courts have nonetheless become an important arena for the fight over gun control; with the *District of Columbia v. Heller* decision in 2008, the US Supreme Court for the first time discovered in the Second Amendment a personal right to keep a handgun in the home for self-protection, with the suggestion that this personal right might also bar other sorts of regulations. Two years later in *McDonald v. City of Chicago*, the Court indicated that the constitutional restriction also applied to states and local governments. Gun-rights advocates have now brought a flood of litigation challenging every sort of restriction on gun design, possession, transactions, and use, with no clear indication of what content the courts will end up assigning to the newfound freedom (Cook, Ludwig, and Samaha 2009, 2011).

Of course much of the “action” in gun control has not been federal, but rather at the state and local levels. Going back to the days of Dodge City and the wild (heavily armed) nineteenth-century frontier, cities have regulated the place and manner of gun carrying and discharge. States have imposed a variety of requirements or bans on transfers, possession, and carrying, with a particular focus on handguns. For example, New York State’s Sullivan Law of 1911 mandated a license for anyone wishing to possess or carry a handgun; in 1921 North Carolina required that anyone seeking to acquire a handgun obtain a pistol permit after satisfying the sheriff of the buyer’s good moral character and need for a handgun for defense of home. In recent years the National Rifle Association has been highly effective in getting the great majority of states to relax their regulations. Most states have now adopted preemption laws (banning local governments from imposing regulations that go beyond the state law) and have eased or erased restrictions on carrying concealed firearms. On another front, about half the states have very recently adopted some version of the “stand your ground” law that allows people to use deadly force to defend themselves if they

feel threatened, even if they are in a public place and have a realistic option to retreat.⁷

Thus the “gun rights” movement has made broad gains in erasing the modest level of control on gun carrying and use that had traditionally been applied by state and local governments. So far, however, federal regulations on gun design and transactions, and on who can legally be in possession, have remained in place. Data systems for background checks have been improved since the Brady Act was first put in place so that would-be buyers with a serious criminal record or a history of serious mental illness are more likely to be blocked from buying a gun from a dealer, although they may well be able to pick up a gun in the secondary market. In any event, it remains to be seen where the US Supreme Court will ultimately draw the line when it comes to protecting the personal right to keep and bear arms.

II. Why Gun Violence Is Worth Studying

I have not been inclined to second-guess my decision to spend so much of my career studying gun violence. Gun violence is an important detriment to our standard of living in the United States and for that reason alone deserves a place on the social science and public health research agendas. Gunshot injuries and deaths have a noticeable effect on life expectancy and contribute to health disparities across race and gender. Guns and gunfire terrorize some inner-city neighborhoods and degrade community life. The choice of weapons by offenders appears to have a profound effect on crime patterns and outcomes. Developing a better understanding of these matters is a worthy goal and may, despite the current political climate, someday prove helpful in redressing the problem.

A. *Victimization*

Approximately 1 million Americans have died from gunshot wounds in homicides, accidents, and suicides during the last three decades. In 2009, the most recent year for which the National Center for Health Statistics provides final tabulations on injury deaths, there were 31,347 firearms deaths, including 11,493 homicides, 18,735 suicides, and 554

⁷ The resulting increase in homicide rates has been persuasively documented (Cheng and Hoekstra 2012; McClelland and Tekin 2012).

unintentional killings.⁸ These counts are similar to those in other years during the last decade. As a point of reference, there were almost as many gun deaths as traffic deaths in 2009 (86 percent). Another point of reference is the years of potential life lost before age 65: guns account for 1 of every 15 years lost to early death from all causes.

Most homicides are committed with guns. Of the 18,361 criminal homicides in 2009, 68 percent were by gunshot. It is also true that half of all suicides are committed with firearms. Of course not all gunshot injuries are fatal. Emergency rooms treated 66,769 nonfatal gunshot injuries in 2009, including 44,466 nonfatal injuries from criminal assaults. And the police recorded over 300,000 assaults and robberies in that year in which the perpetrator used a gun, in most cases to threaten the victim (http://www2.fbi.gov/ucr/cius2009/data/table_19.html).

Gun violence contributes to racial and ethnic disparities in mortality. If one focuses just on males aged 15–34, homicide victimization rates in 2009 (consistent with earlier years) were 16 times as high for blacks as for non-Hispanic whites. Homicide is the leading cause of death for blacks in this age group and the second-leading cause of death for Hispanic males. For all men in this age range, most (84 percent) homicides are committed with guns.

Guns are the weapon of choice for assassins and cop killers. Fourteen of the 15 direct assaults against presidents, presidents-elect, and presidential candidates in US history were perpetrated with firearms, including the five resulting in death. (The one exception of the 15, a failed attack with a hand grenade against President George W. Bush, occurred overseas [Kaiser 2008].) Of the 541 law enforcement officers who were feloniously killed between 2001 and 2010, 490 (92 percent) died of gunshot wounds (<http://www.fbi.gov/about-us/cjis/ucr/leoka/leoka-2010/tables/table27-leok-feloniously-type-of-weapon-01-10.xls>).

Fortunately the homicide rate (both gun and nongun) has dropped in recent years, but from twentieth-century highs in 1980 and 1991 of over 10 per 100,000. The rate was just 5.5 in 2009. The persistent characteristic of American homicide through these ups and downs is the high involvement of guns, particularly handguns. Overall violence rates in the United States are also above average, though not to nearly

⁸ The classification of gunshot deaths as “unintentional” in the Vital Statistics Registry is unreliable. Barber and Hemenway (2011) demonstrate that there are numerous false positives and false negatives in this classification and that to some extent they balance out.

the same extent: one comparison of the United States with other high-income countries found that the US firearm homicide rate was almost 20 times as high but that the nongun homicide rate was “just” 2.9 times as high as the average of the other countries (Richardson and Hemenway 2011).

B. How and Why the Type of Weapon Matters

Years ago a popular bumper sticker claimed that “Guns don’t kill people, people kill people.” The intent was no doubt to suggest that depriving “people” of guns would not remove the impulse to kill. What is missing from this “argument” is that without a gun, the capacity to kill may be greatly diminished. One wag suggested, “Guns don’t kill people, they just make it real easy.” Bumper stickers aside, the true causal role of guns in homicide is one of the fundamental issues in gun violence research and evidence-based policy making.

In some circumstances the claim that the type of weapon matters seems indisputable. There are very few drive-by knifings or people killed accidentally by stray fists. When well-protected people are murdered, it is almost always with a gun; as mentioned above, over 90 percent of lethal attacks on law enforcement officers are with firearms, and all assassinations of US presidents have been by firearm. When lone assailants set out to kill as many people as they can in a commuter train, business, or campus, the most readily available weapon that will do the job is a gun. But what about the more mundane attacks that make up the vast bulk of violent crime?

The first piece of evidence is that robberies and assaults committed with guns are more likely to result in the victim’s death than are similar violent crimes committed with other weapons. In the public health jargon, the “case-fatality rates” differ by weapon type. Take the case of robbery, a crime that includes holdups, muggings, and other violent confrontations motivated by theft. The case-fatality rate for gun robbery is three times as high as for robberies with knives and 10 times as high as for robberies with other weapons (Cook 1987). For aggravated (serious) assault it is more difficult to come up with a meaningful case-fatality estimate since the crime itself is in part defined by the type of weapon used.⁹ We do know that for assaults from which the

⁹ In the FBI’s Uniform Crime Reports, a threat delivered at gunpoint is likely to be classified as an aggravated assault, while the same threat delivered while shaking a fist would be classified as a simple assault.

victim sustains an injury, the case-fatality rate is closely linked to the type of weapon (Zimring 1968, 1972; Kleck and McElrath 1991), as is also the case for family and intimate assaults (Saltzman, Mercy, and Rhodes 1992).

Case-fatality rates do not by themselves prove that the type of weapon has an independent causal effect on the probability of death. It is possible that the type of weapon is simply an indicator of the seriousness of the assailant's intent and that it is the intent, rather than the weapon, that determines whether the victim lives or dies. This view was offered as a reasonable possibility by the revered criminologist Marvin Wolfgang, who in his seminal study of homicide in Philadelphia stated that "it is the contention of this observer that few homicides due to shooting could be avoided merely if a firearm were not immediately present, and that the offender would select some other weapon to achieve the same destructive goal" (1958, p. 83). Wolfgang eventually changed his mind, publishing a retraction in 1995. The same theme is offered by Wright, Rossi, and Daly (1983) and others: the gun makes the killing easier and is hence the obvious choice if the assailant's intent is indeed to kill; but if no gun were available, then, it is asserted, most would-be killers would still find a way. In this view, fatal and nonfatal attacks form two distinct sets of events with little overlap, at least in regard to the assailant's intent.

The speculation that the intent is all that matters always struck me as far-fetched. When a tool is available to make a difficult task (such as killing another person) much easier, then we expect that the task will be undertaken with greater frequency and likelihood of success. Perhaps the most telling empirical evidence on this matter came from Franklin Zimring (1968, 1972), who demonstrated that there is a good deal of overlap between fatal and nonfatal attacks; even in the case of earnest and potentially deadly attacks, assailants commonly lack a clear or sustained intent to kill. For evidence on this perspective, Zimring notes that in a high percentage of cases the assailant is drunk or enraged and is unlikely to be acting in a calculating fashion. Whether the victim lives or dies then depends importantly on the lethality of the weapon with which the assailant strikes the first blow or two.

Zimring's studies of wounds inflicted in gun and knife assaults suggest that the difference between life and death is often just a matter of chance, determined by whether the bullet or blade finds a vital organ. It is relatively rare for assailants to administer the coup de grace that

would ensure their victim's demise. For every homicide inflicted with a single bullet wound to the chest, there are two survivors of a bullet wound to the chest that are indistinguishable with respect to intent. It is largely because guns are intrinsically more lethal than knives that gunshot injuries are more likely to result in death than sustained attacks with a knife to vital areas of the body (Zimring 1968). Zimring's second study provided still more compelling evidence by comparing case-fatality rates for gunshot wounds with different calibers: a wound inflicted by a larger-caliber gun was more likely to prove lethal than a wound inflicted by a smaller-caliber gun. Assuming that the caliber of a gun is not correlated with the intent of the assailant, the clear suggestion is that the type of weapon has a causal effect on outcome.

Zimring's argument in a nutshell is that robbery murder is a close relative of robbery, and assaultive homicide is a close relative to armed assault; death is in effect a probabilistic by-product of violent crime. Thus while the law determines the seriousness of the crime by whether the victim lives or dies, that outcome is not a reliable guide to the assailant's intent or state of mind.

One logical implication of this perspective is that there should be a close link between the overall volume of violent crimes and the number of murders, moderated by the types of weapons used. Where Zimring provided a detailed description of cases as the basis for his conclusion, tests based on aggregate data are also potentially informative. My contribution was to demonstrate that robbery murder trends in 43 large cities (those for which I could obtain data) behaved just as we would expect given the "probabilistic by-product" claim: a tight connection between variation in robbery and in robbery murder and a finding that an increase of, say, 1,000 gun robberies was associated with three times as many additional murders as an increase of 1,000 nongun robberies (Cook 1987). "Instrumentality" provides a natural explanation for these patterns.

Years later, Franklin Zimring and Gordon Hawkins (1997) published *Crime Is Not the Problem*, making the case that violent crime rates in American cities are not particularly high relative to their counterparts in other parts of the developed world except for homicide and gun-related crimes generally. American "exceptionalism" is the result of the unparalleled prevalence of firearms in assaults and robberies in the United States. In this view, American perpetrators are not more vicious

than those in Canada, Western Europe, and Australia. Americans are just better armed.

As it turns out, my first entry in gun violence research was about instrumentality (Cook 1976). In 1975, criminologist Wesley Skogan was pioneering a research program based on the newly released federal crime survey data. He provided me with access to the data and encouragement to work on a detailed study of robbery. True to my economics training, my inquiry was guided by speculations based on the likely objectives of robbers (choose lucrative victims, control them, make good the escape). Use of a gun enhances the robber's power, making it possible successfully to rob hard-to-control but relatively lucrative victims (groups, businesses). On the basis of this reasoning, I predicted that gun robberies would be more likely to be successful than other robberies and involve more loot when they do succeed. Further, robbers with guns should be able to control the situation by use of the potent threat of the gun rather than by physical attack (as with a strong-arm robbery or mugging).

These predicted patterns were evident in the victim survey data. The success of this "strategic choice analysis" of robbery helped establish that robbers can be usefully viewed as making choices that are sensible given their goals. It also provided a basis for quantifying the value of a gun in this type of crime. I recently returned to this topic and found that, other things equal, robbers bearing guns are 12.5 percentage points more likely to succeed than are their knife-wielding counterparts, and when robberies by firearm do succeed, the average value of offenders' "take" almost doubles (Cook 2009).¹⁰ Further, the likelihood of injury to the victim depends on the type of weapon, with gun robberies the least likely to involve injury. Of course when the robber does fire his gun, it is quite likely that the victim will die, making gun robberies by far the most lethal type of robbery (Cook 1980). In any event, that gun robberies are so much more lucrative than robberies with other weapons raises an interesting question: Why are most robberies committed without a gun? One likely answer is that many robbers lack ready access to a gun.

In sum, the type of weapon deployed in violent confrontations is not just an incidental detail; it matters in several ways. Because guns pro-

¹⁰ Kleck and McElrath (1991) found similar patterns in aggravated assault, which, like robbery, is often motivated by the desire to coerce the victim to do something against his or her will.

vide the power to kill quickly, at a distance, and without much skill or strength, they also provide the power to intimidate other people and gain control of a violent situation without an actual attack. When there is a physical attack, then the type of weapon is an important determinant of whether the victim survives, with guns far more lethal than other commonly used weapons.

The most important implication of this “instrumentality” perspective is that policies that are effective in reducing gun use in violent crime would reduce the murder rate, even if the volume of violent crime were unaffected. As it turns out, about half of the states have incorporated sentencing enhancements for use of a gun in crime (Vernick and Hepburn 2003). These enhancements, most of which were adopted in the 1970s and 1980s, were intended to reduce gun use in violence; systematic evaluations offer some indication that they have been effective (Loftin and McDowell 1981, 1984; Abrams 2012).¹¹ In any event, the widespread adoption of gun enhancements by state legislatures is a clear indication of the commonsense appeal of the instrumentality effect.

C. The Social Costs of Gun Violence

Generating a comprehensive measure of the societal impact of gun violence requires imagining all the ways in which it affects the quality of life. The elevated rate of homicide, as important as it is, provides just the beginning in this calculation. I was given the opportunity to generate a broader estimate of social costs with a grant from the Joyce Foundation in 1997.¹² I had the good fortune to persuade Jens Ludwig to join me on this project. We had already begun a highly rewarding collaboration that continues to this day. Our ultimate goal was to establish a ballpark estimate of the magnitude of this problem in terms that could be compared with other problems of health, safety, and urban development.

¹¹ Cook and Nagin (1979) documented the influence of weapon use in a case on prosecutorial and judicial discretion. Defendants who used weapons were more likely to be convicted and sentenced to prison in the District of Columbia in 1974, but there was little distinction between guns and other types of weapons. Podkopacz and Feld (1996) document the importance of weapon use as an influence on the decision to waive juveniles to adult courts.

¹² In the 1990s the Joyce Foundation initiated a funding stream in the area of gun violence under the leadership of its president, Deborah Leff. Joyce remains the leading funder in this area.

The traditional approach for valuing disease and injury is the “cost-of-illness” method, a method that we rejected since it misses most of what is important about gun violence. In essence, the cost-of-illness approach values people the way a farmer would value his livestock, on the basis of their productivity and market value. Our alternative approach, which is generally favored by economists, values the reduction in risk of injury according to the effect on the subjective quality of life. In short, the difference is between whether we value safety on the basis of how the lives saved contribute to gross domestic product (the cost-of-illness approach) or rather by the value that people place on living in a safer environment.

In our perspective, violence, particularly gun violence, is a neighborhood disamenity like pollution, traffic, and poor schools. Anyone living in a neighborhood where gunshots are commonly heard is likely to be negatively affected. The possibility of being shot, or of a loved one’s being shot, engenders fear and costly efforts at avoidance and self-protection, as when mothers keep their children from playing outside for fear of stray bullets. Property values suffer as people with sufficient means move to safer neighborhoods, and businesses suffer as customers gravitate to shopping areas where they feel comfortable. Tax revenues are diverted to cover the financial costs of medically treating gunshot victims (usually at public expense) and of law enforcement needs (Cook et al. 1999).

The costs of fear, suffering, and avoidance are largely subjective. The challenge is to place a monetary value on these subjective effects and, in particular, to estimate how much households would be willing to pay to reduce the perceived risks. One approach is to analyze property values, comparing neighborhoods that are differentially affected by gun violence while controlling for other factors that may be relevant in that market.¹³ That approach is bound to be incomplete (since at best it can capture only the local place-related effects of gun violence) and poses an almost insurmountable statistical challenge (since other disamenities are highly correlated with gun violence). For those reasons we opted to use an entirely different approach, the contingent valuation method, to provide a comprehensive cost estimate in monetary terms. This method, widely used by economists in valuing different aspects of the environment, had not previously been used to value a reduction in

¹³ One of the first studies of property values and crime was by Thaler (1978).

crime or violence, although it is appropriate for the task and was later used by Mark Cohen and his colleagues (2004) to estimate the social cost of several types of crime.

To perform the contingent valuation estimate, we included a series of questions on a national survey that asked whether respondents would be willing to vote for a measure that would reduce gun violence in their community by 30 percent, if it were going to cost them a specified amount (which we varied across respondents). The pattern of answers was interesting and quite reasonable; for example, respondents with children at home had a greater willingness to pay than those without. Our overall estimate was that such a reduction would be worth \$24 billion (Cook and Ludwig 2000; Ludwig and Cook 2001). Multiplying up to a hypothetical 100 percent reduction, we could estimate that interpersonal gun violence at the time was an \$80 billion problem and that the subjective costs were by no means confined to the people and communities that were at highest risk of injury; indeed, the willingness to pay for this reduction actually increased with income.

In sum, the threat of gun violence degrades the quality of life in affected communities. Reducing gun violence would have tangible societal value, which we measured by asking how much households would be willing to pay for a specified reduction in this disamenity. Our estimate is large enough to establish gun violence as a serious problem.¹⁴

D. The Opportunity to Inform Law and Policy

It could be argued that while gun violence is important in terms of its societal impact, research is unlikely to make a difference in the political arena and hence is of little practical value. While it is true that Congress seems unlikely to make large changes in the legal framework for regulating guns in the foreseeable future, it is not true that policy is static in this area. Local authorities continue to wrestle with the problem of gun violence and in many cases have adopted law enforcement tactics that are intended to deter gun use by gangs and

¹⁴ We have been accused of focusing on the costs of gun violence while ignoring the benefits conferred to owners. But we do not claim to have presented a complete cost-benefit analysis of any particular intervention, let alone a ban on private gun ownership. Many of the available approaches to reducing gun violence have little effect on the enjoyment of guns by law-abiding owners, e.g., sentencing enhancements for use of guns in crime or improved record keeping of gun transactions. In colloquial terms, our estimate is relevant to judging whether gun violence is a big enough problem to deserve priority for policy makers. Any specific intervention should be evaluated in terms of both its benefits (reduced gun violence) and its costs.

criminals. There are numerous bills before state legislatures every year, in most cases seeking to relax legal restrictions on gun carrying, possession, and use. And perhaps most important, the federal courts are deluged with Second Amendment lawsuits seeking to tear down existing firearms regulations of all sorts.

The relevant Supreme Court opinions (in the *Heller* and *McDonald* cases) did not specify how the Court would ultimately decide the scope of the new personal right to keep and bear arms. The majority opinion in *Heller* stated that the door was left open to continued restrictions on the types of weapons allowed in private commerce and the kinds of people that would be allowed to acquire and keep firearms. It is possible that the court will consider arguments about the costs of doing away with particular regulations as part of what in effect would become a test that balances this new freedom against the legitimate concern of government for preserving public safety (Cook, Ludwig, and Samaha 2011). If so, then there is obvious scope for empirical social science, which offers the tools for estimating the relevant trade-offs.

III. Measurement Puzzles in the Quest for Evidence-Based Policy

The “evidence” base for the study of guns and violence begins with data on such fundamental issues as the number and distribution of guns, the number of people shot each year in criminal assaults, and the frequency of gun use in self-defense. These simple descriptive statistics should be readily available, and in fact the rhetoric of the Great American Gun War routinely includes reference to 300 million guns, or 100,000 people who are shot each year, or 2.5 million defensive gun uses. But it turns out that such statistics should be viewed with considerable skepticism. Developing reliable estimates of basic facts in this arena is surprisingly difficult, even with the best of intentions.

There exist administrative data compiled by government agencies on each of these topics, but those data are sometimes incomplete, difficult to access, unconnected with the context, or all of these. As a result, analysts have made extensive use of population surveys, which in principle can overcome the limitations of administrative data. For example, if you want to find out how many guns are in private hands, why not ask a representative sample of US households whether there is a gun on the premises and, if so, how many? However, it turns out that even

state-of-the-art survey methods can generate heavily biased estimates. The existence and nature of these biases have been matters of heated debate in one of these areas, defensive gun uses, because of its political import. But it should be understood that the word “bias” in this context does not refer to political bias, but rather a predictable error characteristic of a particular estimation method. The surprise is that the survey methods used to generate such error-prone estimates are not obviously deficient but are widely accepted in social science. Hence there are methodological lessons that go well beyond the arena of gun violence. Here I recount three examples in domains in which I have been active.

A. How Many Guns in Private Hands?

Administrative data on manufacturing and net imports of guns since 1899 have been compiled by the federal government. These data provide only the roughest of guides to the total number of guns currently in private hands; the attrition rate of guns through breakage and confiscation is unknown, and administrative records have no information on off-the-books imports and exports (say, to Mexican drug gangs; Kleck 1991, app. 1). Administrative data on the prevalence of household gun ownership are almost entirely lacking. Data of that sort could be generated only through licensing or gun registration, which at the federal level is required only for owners of machine guns and other weapons of mass destruction. A few states require licensing or registration, but compliance with those requirements is likely to be far less than 100 percent.

Sample surveys appear to offer a good alternative to administrative data. For example, the General Social Survey (GSS), conducted by the National Opinion Research Center, has long included questions on gun ownership. In 1999 it estimated that just 36 percent of American households owned at least one firearm, down from nearly 50 percent in 1980 (Smith 2000, p. 55).¹⁵ To determine the number of guns in private hands requires that a survey ask how many guns are in the household, and that question has been quite rare. In our first “gun” project together, Ludwig and I used the 1994 National Survey of Pri-

¹⁵ The drop in household ownership may reflect the trend in household composition during this period; households are less likely to include a gun because they have become smaller and, in particular, are less likely to include a man (Wright, Jasinski, and Lanier 2012).

vate Ownership of Firearms (NSPOF) to generate detailed estimates. We found that 25 percent of adults (most of them men) owned at least one gun and that the average gun-owning adult owned 4.4; multiplying up, we estimated the total number of guns in private hands as 192 million (one-third of which were handguns; Cook and Ludwig 1996). The most detailed national survey on the subject since then (the National Firearms Survey) found that gun-owning households averaged 5.2 guns in 2004, up substantially from the 1970s (Hepburn et al. 2007).

As it turns out, however, survey-based estimates of gun ownership are subject to sizable bias. One piece of evidence comes from a comparison of responses by husbands and wives. In the GSS sampling procedure, whether the husband or wife is selected as the respondent for a household that is headed by a married couple is determined randomly, so we expect that about the same percentages should report a gun in the household. In fact husbands are consistently more likely than wives to report a gun, with the difference as high as 10 percentage points in some years (Ludwig, Cook, and Smith 1998). Using NSPOF data, we found that if husbands' answers were to be believed, the estimated national stock of handguns would be twice as high as if we believed the wives' answers (Cook and Ludwig 1996). It is tempting to believe that the husbands are more accurate since they are likely to be the primary owners and users of any guns and may be better informed and less reluctant to admit to owning a gun in a survey.¹⁶ But that is not necessarily the case: some respondents may want to overstate their gun collection to impress the interviewer.

Analysis of a two-generation survey in California found that the same pattern appeared when teenagers were asked about guns in the home: the boys were much more likely to say yes than the girls (Cook and Sorenson 2006). In this survey there was enough information to determine that the difference in response was accounted for by the difference in participation in gun sports, suggesting that the response is influenced by whether the respondent has firsthand knowledge.

Thus we have no reliable way to estimate the number of guns in private hands, and survey-based estimates are problematic. The best

¹⁶ NSPOF asks about how many guns the respondent personally owned and how many guns were in the household. We considered the answers to the personal ownership question more reliable and used them to generate the estimate of 192 million guns in private hands.

that can be hoped for is a ballpark estimate, something like 200–300 million. It should be noted that while survey responses provide an unreliable guide to the number of guns or prevalence of gun ownership in any one year, it is possible that the downward trend found in the GSS in the 1980s and 1990s reflects reality; that would be true, for example, if the extent of survey bias is more or less constant over time (like a scale that always weighs 5 percent light).

B. How Many Gun Injuries from Assaults?

The difficulty in estimating the number of assault victims who are shot in any one year follows somewhat the same story line, with one difference: the total of gunshot victims includes those who die, and that number is accurately recorded as part of the national Vital Statistics program. The count of nonfatal gunshot injuries is not compiled in any official record. Estimates based on a sample of emergency rooms (National Electronic Injury Surveillance System, or NEISS) may be reasonably accurate but are incomplete since some unknown fraction of gunshot victims do not seek treatment there.¹⁷ The NEISS estimate that 44,000 assault victims were treated for gunshot wounds in 2009 thus understates the total number of gunshot victims in assaults. The police are likely to know about most of those cases (because medical staff are required to report in many states), and some of the cases not treated in emergency rooms will come to police attention as well (as a result of 911 calls).¹⁸ Unfortunately, police records on gunshot victims are not separately compiled as part of the FBI's Uniform Crime Reporting system, but rather are submerged in the much larger category of "aggravated assault."

In principle, survey data could provide a comprehensive estimate of nonfatal injuries. The National Crime Victimization Survey (NCVS; conducted by the Census Bureau on behalf of the US Department of Justice) has asked the relevant questions of a nationally representative

¹⁷ The gunshot injury data are based on a sample of emergency departments through the NEISS All Injury Program operated by the US Consumer Product Safety Commission with CDC's National Center for Injury Prevention and Control.

¹⁸ Kellermann et al. (2001) report a systematic effort in the Atlanta area to compare gunshot cases from medical records with those known to the police through 911 calls. The overlap was far from complete, and it appears that in Atlanta and elsewhere the mandatory reporting requirement is not being enforced. The NEISS estimate, however, does not depend on reports by medical staff to the police, but rather is generated directly from medical records.

sample since 1973 and released annual estimates of the number of gunshot victims in assaults. These estimates turn out to be highly biased, despite the fact that the NCVS is an exceptionally well-crafted survey. I first became aware that there might be a problem when I compared the estimated nonfatal injury rate with the known rate of fatal gunshot wounds in assaults (homicides). The ratio of nonfatal (from the NCVS) to fatal was 21, which implied that fully one in three gunshot victims die, which is not remotely true. I found a variety of sources of information on the case-fatality rate in assaults in which the victim was shot, and a consistent finding emerged: rather than a one in three death rate among victims of criminal shootings, the actual fatality rate is typically about one in seven (Cook 1985).¹⁹

The likely reason for the underestimate of nonfatal gunshot victims in the NCVS is that they are underrepresented in the sample. A large percentage of assault victims are drawn from the ranks of youthful men who are difficult to contact because they have no regular address and, in any event, may be reluctant to talk to an interviewer. In these respects there is a good deal of socioeconomic overlap between the shooters and the victims.

Fortunately the homicide fatality data are quite accurate, and we can get a pretty good estimate of the overall number of injuries by multiplying by the inverse of the case-fatality rate. For example, using my one in seven case-fatality rate implies that the 11,493 gun homicide victims were among 80,000 shooting victims that year, of whom 68,500 survived. That estimate comports well with the 44,000 nonfatal criminal gunshot cases that NEISS estimates were treated in emergency departments.²⁰ What I have proposed, then, is to ignore the national survey estimates and generate estimates instead by using an evidence-based multiplier of the official count of gun homicides. That work-around appears to provide fairly accurate estimates.

Note that the large bias in the NCVS estimates that I discovered exists with respect to a narrow category of victimization (shot during a criminal assault) that is concentrated among a group that may in practice be underrepresented in the survey sample. For most types of criminal victimization the sampling procedure would be adequate for generating a good estimate.

¹⁹ This estimate was subsequently confirmed and reported in a doctoral dissertation at the University of Maryland (Long-Onnen 2000).

²⁰ Note that suicides and attempted suicides are omitted from these calculations.

C. How Many Defensive Gun Uses?

While guns do enormous damage in crime, they also provide some crime victims with the means of escaping serious injury or property loss. The NCVS, despite its limitations, is generally considered the most reliable source of information on predatory crime since it has been in the field since 1973 and incorporates the best thinking of survey methodologists. From this source it would appear that use of guns in self-defense against criminal predation occurs approximately 100,000 times per year (Cook, Ludwig, and Hemenway 1997). Of particular interest is the likelihood that a gun will be used in self-defense against a residential intruder. Using the NCVS data for the mid-1980s, I found that only 3 percent of victims were able to deploy a gun against someone who broke in (or attempted to do so) while they were at home (Cook 1991). Since about 45 percent of all households possessed a gun during that period, I concluded that it is relatively unusual for victims to be able to deploy a gun against intruders even when they have one nearby.

In contrast are the results of several smaller, one-time telephone surveys, which provide a basis for asserting that there are millions of defensive gun uses per year (Kleck and Gertz 1995; Cook and Ludwig 1996). Why do these one-time surveys produce estimates that exceed the NCVS estimate by more than one order of magnitude? One explanation is that the NCVS asks questions about defensive actions only to those who report a victimization attempt, while the phone surveys ask such questions of every respondent. While as a logical matter it seems as if that should make little difference, it is quite possible that some NCVS respondents fail to report a defensive gun use (DGU) because they did not think to report to the interviewer the criminal threat that initiated it. In that case the NCVS will include false negatives in its estimate of DGUs. On the other hand, survey questionnaires that ask an open-ended question about self-defense uses greatly expand the scope for false positives (Cook, Ludwig, and Hemenway 1997; Hemenway 1997*a*, 1997*b*).²¹ Moreover, as the National Research

²¹ The possibility of false negatives is also increased. But given the rarity of gun use in self-defense, the effect of the two types of error is not symmetric. Even a small false positive rate will have a large proportional effect on self-defense uses. That insight is due to Hemenway (1997*a*, 1997*b*). For example, if 1 percent of responses are false positives, that by itself would be nearly enough to produce the Kleck and Gertz estimate of 2.5 million. Given that a representative sample of the US public would include many who are demented, are intoxicated, or have a political agenda around this issue,

Council's Committee to Improve Research Information and Data on Firearms notes, "fundamental problems in defining what is meant by defensive gun use may be a primary impediment to accurate measurement" (Wellford, Pepper, and Petrie 2005, p. 103; see also McDowall, Loftin, and Presser 2000). When respondents who report a defensive gun use are asked to describe the sequence of events, many of the cases turn out to have involved something other than an immediate threat, and a majority of such self-reported cases were thought by a panel of judges to be illegal (Hemenway, Miller, and Azrael 2000).

To my mind the most compelling challenge to the survey-based claim that there are millions of DGUs per year derives from a comparison with what we know about crime rates. The famous 2.5 million DGU estimate is well over twice the total number of gun crimes estimated at that time in the NCVS, which in turn is far more than the number of gun crimes known to the police.²² Likewise, the number of shootings reported by those who claimed to be defending themselves vastly exceeds the total number of gunshot cases in the United States. The estimated number of DGUs from surveys is highly sensitive to the sequence of questions and to whether the respondent is given some help in placing events in time (so that when asked about the previous 12 months he or she does not bring in events that happened before that period).²³ When the same respondents in the same sort of one-time survey are asked about both DGUs and victimization by guns, they report many more victimizations than DGUs (Hemenway, Miller, and Azrael 2000).

There are lessons here for survey methodology and for gun policy. The methodological lesson is that survey-based estimates of what appears to be a well-defined construct (use of a gun in self-defense during the last year or last 5 years) are hypersensitive to survey design, to the extent that estimates may differ by a factor of 25 or more. Another

it would not be surprising to get that high of a false positive rate. It raises the larger question of when sample surveys can be trusted as the basis for estimating rare events.

²² The NCVS for 1994 estimated that 10.9 percent of the nearly 10 million personal crimes of violence involved guns, for a total of 1.07 million gun crimes (<http://bjs.ojp.usdoj.gov/content/pub/pdf/Cvius945.pdf>, table 66).

²³ One of the great strengths of the NCVS, compared with these one-time surveys, is that its sample retains a household for seven interviews, one every 6 months. The previous interview is used as a way to provide the respondent with a bracket in placing events in time in answering the question of whether he or she had been victimized in the previous 6 months.

lesson for gun policy is that what some individuals consider to be a legitimate use of a gun in self-defense may be highly problematic in practice.

D. Thoughts on Methodology

Even surveys that meet the highest standards of current practice may produce heavily biased estimates. The results discussed here should encourage skepticism and engender what might be called “plausibility tests”: commonsense comparisons of the resulting estimates with other sources of information. Too often the review of scientific contributions is like appellate review of a criminal conviction: the court focuses on just the process rather than on the outcome. For policy-relevant work it is important to test the conclusions against what else we know about the reality of the situation.

IV. Gun Availability and Use

My first project as a gun researcher, in 1976, focused on the “instrumentality effect.” Convinced that the intrinsic lethality and power of an assault are influenced by the type of weapon, the next question was what determines the assailant’s choice of weapon. The NCVS data indicate that the victim was confronted with a gun in only about one-quarter of robberies, a fact that has always struck me as surprising given my finding that gun robberies tend to be far more successful and lucrative than knife robberies. It is possible that the explanation for the low prevalence of gun use is that robbers consider it risky or uncomfortable to carry a gun or are concerned that a gun robbery would carry a heavier sentence if they are caught (Cook and Nagin 1979; Abrams 2012). Another possibility, of course, is that most robbers do not own or have ready access to a gun. Some evidence supports that view: in anonymous surveys a majority of arrestees and prisoners report that they do not own a gun. Some say that it would take them a day or more to obtain one or that guns are too expensive (Cook et al. 2007).

The notion that guns are scarce and that many youths and criminals would like to have one but do not is counterintuitive. After all, over one-third of households possess a gun, usually several, and the total number in private hands while uncertain is likely sufficient to provide one to every adult in the United States. New York University law professor James Jacobs (2002) observes in this regard, “Some criminals

claim that it is as easy to buy a gun on the streets as it is to buy fast food. One Chicago gang member stated, ‘It’s like going through the drive-through window. Give me some fries, a Coke, and a 9-millimeter’” (quoted in Terry 1992, p. A1). Jacobs makes an extended argument that regulating gun markets is futile because underground markets will inevitably find ways around legal restrictions. This view of the power of the market and private incentives to surmount all obstacles is commonplace in economic rhetoric. Rightly or wrongly, that view, widely shared, has emboldened the gun rights movement (Goss 2006).

A. Do Youths and Criminals Have Trouble Obtaining Guns?

One approach to understanding whether the difficulty or expense of keeping a gun influences criminals’ choice of weapons is to ask them. In one study, Stephanie Molliconi and I interviewed youths in a North Carolina reformatory and learned that most of them had some experience with guns, but possession for them was a fluid matter. They reported periods during their delinquent careers in which they were unarmed because they had sold their gun or traded it for other valued items—or had it stolen (Cook, Molliconi, and Cole 1995).

More recently the ethnographer Sudhir Venkatesh conducted a far more extensive inquiry into the underground gun market in two neighborhoods of South Side Chicago, interviewing hundreds of gang members, robbers, prostitutes, drug dealers, and people active in the gun trade (Cook et al. 2007). What he was able to document from these interviews is a widespread belief in the value of guns, coupled with surprising ignorance about how they work and how to go about obtaining one—or the appropriate ammunition. When there was a successful transaction, the prices tended to be substantially higher than in the legal market, despite the questionable quality of the guns that were changing hands. The drug-dealing gangs did not deal in guns because they were concerned that it would lead to a police crackdown (and would put their main source of income, drug dealing, at risk). Some criminals, wanting a gun but not knowing how to obtain one, hired a broker who for a substantial fee (\$30–\$50) attempted to find one. The overall impression from Venkatesh’s ethnography, supplemented by more traditional evidence that we analyzed for this project, is that the underground market in guns does not work smoothly, as Jacobs and others had imagined. There were far fewer transactions than for the underground drug market and high transaction costs, since potential

buyers and sellers had trouble finding each other or trusting each other. Inflated prices, long waits, and suspect quality were the norm.

It should be noted that Chicago at that time was exceptional in that it had a handgun prohibition (since found unconstitutional) and no retail gun dealers. While it is easy to imagine that active criminals might obtain guns by sending their girlfriends to a suburban dealer to make a straw purchase, that scenario was very rare, as we were able to demonstrate by analyzing the transaction history of guns confiscated by the Chicago Police Department (Cook et al. 2007). Do criminals have easier access to guns in jurisdictions where there is a legal market or where gun ownership is more prevalent than in Chicago? Based on survey data of arrestees collected through the Drug Use Forecasting program of the US Department of Justice, our tentative answer is yes; the fraction of arrestees who owned a gun increased with overall prevalence of household gun ownership across 22 cities (Cook et al. 2007, p. F605; see also Cook and Ludwig 2002).

The direct inquiries in the North Carolina reformatory and the Chicago streets both suggest that guns are desirable but scarce commodities to youths and criminals and that gun availability affects whether a particular criminal is armed at any one time. It appears that relative scarcity is one factor limiting the use of guns in crime.

B. To What Extent Does the Prevalence of Gun Ownership Influence Gun Use in Crime?

While the United States is an outlier among wealthy nations with its high prevalence of gun ownership, there are wide differences across jurisdictions within the United States. Rates range from something like 13 percent in Massachusetts to 60 percent in Mississippi (Azrael, Cook, and Miller 2004). It seemed plausible to me that the variation in gun ownership would influence the use of guns in crime, both in the obvious way (the household gun might be turned to criminal use, perhaps by a teenage son) and indirectly through theft, loans, and casual transactions—all of which would be easier to arrange in a gun-rich community than in one where guns were rare. The various channels by which criminals become armed can be documented up to a point from various data sources (Cook, Molliconi, and Cole 1995; Braga et al. 2002). For example, the 1997 Survey of Inmates in State Correctional Facilities asked inmates who had been in possession of a gun where they had obtained it. Of those serving their first prison sentence, less

than 20 percent said they obtained their gun from a licensed dealer, while 40 percent got it from a friend or family member, 31 percent by theft or a transaction in the underground market, and 9 percent from other sources (Harlow 2001, table 9).

A test of the hypothesis that greater gun prevalence induces greater gun use in crime requires a measure of the prevalence of gun possession, a measure that is valid for comparing jurisdictions at a point in time and tracking movements over time. Given the lack of administrative data on ownership and of survey data for small areas on a consistent or reliable basis, I thought what was needed was an index that could be computed from reliable administrative data. My first effort (Cook 1979) was to average the percentages of suicides and homicides committed with guns. These percentages are available for states and large counties from the National Vital Statistics System and are highly correlated with each other, suggesting that they measured the same underlying construct. The geographic patterns in my index made sense from what was known or could be inferred from other sources. On the basis of this gun prevalence index, I was able to show, for example, that gun prevalence has a substantial effect on weapon choice in robbery and on the robbery murder rate but no effect on the overall robbery rate. Thus more guns meant more gun robberies, fewer nongun robberies, and more robbery murders (due to the instrumentality effect, presumably). Twenty years later, two scholars working at the Harvard Injury Control Research Center, Deborah Azrael and Matthew Miller, experimented with various indexes of gun prevalence and discovered that I had been half right in 1979: of all the indexes in use or that they could imagine, the best was simply the percentage of suicides with guns. We worked together to validate this new index (Azrael, Cook, and Miller 2004) and have since worked separately in using it to explore the effects of prevalence on injury and crime patterns. In a rare meeting of minds, Gary Kleck (2004) published an article that also endorsed the gun percentage in suicide as a valid index of cross-section variation in gun prevalence. He and I part ways on whether the index is also valid for tracking changes over time (Cook and Ludwig 2006a).

Several studies have investigated the effect of gun prevalence (measured by this proxy of firearm suicide divided by suicide) and homicide rates across counties (see, e.g., Cook and Ludwig 2002; Miller, Azrael, and Hemenway 2002). However, the interpretation of such results is in some doubt. It is difficult to isolate a causal mechanism from analysis

of cross-section data. Gun-rich jurisdictions, such as Mississippi, are systematically different in various ways from jurisdictions with relatively few guns, such as Massachusetts. The usual approach for addressing this “apples and oranges” problem has been to control statistically for other characteristics, such as population density, poverty, and the age and racial composition of the population. But these variables never explain very much of the cross-sectional variation in crime rates (Glaeser, Sacerdote, and Scheinkman 1996), suggesting that the list of available control variables is inadequate to the task. Also unclear is whether widespread gun ownership is the cause or effect of an area’s crime problem, since high crime rates may induce residents to buy guns for self-protection. These same concerns are arguably even more severe with cross-sectional comparisons across countries.

Some of the problems with cross-sectional studies can be overcome by using panel data—repeated cross sections of city, county, or state data measured at multiple points in time—to compare changes in gun ownership with changes in crime. Compared with Massachusetts, the state of Mississippi may have much higher homicide rates year after year for reasons that cannot be fully explained from existing data sources. But by comparing changes rather than levels, we implicitly control for any unmeasured differences across states that are relatively fixed over time, such as a “Southern culture of violence” (see Butterfield 1997; Loftin and McDowell 2003). The best available panel data evidence suggests that more guns lead to more homicides, a result that is driven entirely by a relationship between gun prevalence and homicides committed with firearms; there is little association of gun prevalence with nongun homicides or other types of crimes (Duggan 2001; Cook and Ludwig 2006a).

It is no surprise that not all scholars are on board with this finding. In his book *More Guns, Less Crime*, Lott (1998) reports an analysis that finds that an increase in gun prevalence is associated with a reduced murder rate. In that study Lott uses a measure of gun prevalence that has not been validated and is of dubious validity (see Cook and Ludwig 2006a).²⁴ His aberrant finding is an example of an important but un-

²⁴ Lott uses voter exit poll data to estimate state-level gun ownership. Voters are by no means a representative sample, and the voting “sample” changes from election to election. That may explain why Lott’s data indicate that from 1988 to 1996 gun ownership rates increased for the United States as a whole from 27.4 to 37.0 percent (2000, p. 36). Yet the best source of national data on gun ownership trends, the GSS,

surprising lesson, that the analytical details, such as just what index of gun prevalence is used, can have a large effect on the results.

Finally, it is worth emphasizing that my conclusion is not “more guns, more crime.” My research findings have been quite consistent in demonstrating that gun prevalence is unrelated to the rates of assault and robbery (Cook 1979; Cook and Ludwig 2006*a*; see also Kleck and Patterson 1993). The strong finding that emerges from this research is that gun use intensifies violence, making it more likely that the victim of an assault or robbery will die. The positive effect is on the murder rate, not on the overall violent-crime rate. More guns, more homicides.

C. What about Changes in Gun Market Regulation?

An alternative approach for learning about the effects of gun availability on public safety is to examine the effects of policy changes that are intended to influence overall gun ownership rates or gun availability to dangerous people. That approach has the advantage of being directly relevant to policy evaluation. But it has proven difficult in practice.

Since 1968, when the Gun Control Act was adopted, the biggest victory for those seeking stronger gun control was the Brady Handgun Violence Prevention Act (Pub. L. 103-59, 107 Stat. 1536). This act required that every state institute a system for checking the background of anyone seeking to purchase a firearm from a federally licensed dealer. Since some states already had background check systems in place, they were not affected by the law and hence served as a ready-made control group for determining the effect of the law in other states. Ludwig and I determined that the effects on homicide and overall suicide rates, if any, were not large enough to emerge from the statistical noise; that is, we accepted the null hypothesis (Ludwig and Cook 2000). Publication of this finding put us in the doghouse with gun control advocates and perhaps surprised pro-gun advocates who had long typecast me as “anti-gun.” In fact there was no political agenda behind our research, except the judgment that the Brady Act was important enough to warrant evaluation.

So saying, it behooves us to be very careful about interpreting our

indicates that individual gun ownership trends were essentially flat during this period (Kleck 1997, pp. 98–99).

finding. Given our statistical results, we cannot rule out the possibility that the Brady Act reduced (or increased) the homicide rate by a small percentage. Our best estimate of its effect, which is near zero, is not that precise. Furthermore, the apparent lack of a strong effect may well be due to the weakness of the act itself rather than a flaw in the basic approach. Brady left unregulated the informal “secondary” market by which most youths and criminals actually obtain their guns. That is more than a loophole: it is a gaping barn door. Finally, our approach, which treats the “no-change” states as controls in a natural experiment, may underestimate the true effect if in fact there were spillovers from the “change” states. For example, Illinois was one of the states in the control group (states that were not required by the Brady Act to change the procedure for gun transactions), but there is very clear evidence that gun trafficking into Chicago was transformed by the Brady Act: licensed dealers in the deep South, which had been an important source of the guns that were ultimately used by criminals in Chicago, were almost eliminated as a source in 1994, apparently replaced by dealers in Illinois (Cook and Braga 2001). If the Brady Act reduced homicides in the control states, then our finding of “no difference between control states and treatment states” leaves open the possibility that the Brady Act was effective after all.

Other analysts have evaluated state and federal regulations on gun transactions and possession (e.g., Webster, Vernick, and Hepburn 2001, 2002; Webster, Vernick, and Bulzacchelli 2010).²⁵ It seems fair to say that a good deal of uncertainty remains about the efficacy of these measures on the ultimate outcomes of concern—most notably homicide rates. The National Firearms Act of 1934, which required national registration of weapons of mass destruction (such as submachine guns and hand grenades) and imposed a confiscatory transfer tax, appears to have been effective in curtailing the use of such weapons in crime. A variety of other regulations are sensible, are supported by some evidence, and may in fact have benefits that exceed costs. The statistical challenge is to persuasively document effects that are likely to be of modest size relative to the usual variability of violent crime rates.

Take for example the pending California “microstamp” requirement that semiautomatic pistols have the firing pin and breech plate en-

²⁵ For reviews, see Hemenway (2004), Wellford, Pepper, and Petrie (2005), and Cook, Braga, and Moore (2010).

graved with a registered serial number so that when the gun is fired the cartridge casing is traceable to the particular gun and its registered owner. This regulation is intended to assist law enforcement in solving crimes in which a pistol was fired by the perpetrator, and it is reasonable to believe that it will do so. It is true that savvy gunmen can avoid being caught if they remember to pick up any shell casings at the scene or use an older pistol or revolver. But fortunately not all shooters are that savvy. We can project a gradual increase in the rate of arrest for shootings (as new semiautomatics go into circulation) and a resulting deterrent effect on serious violent crime. A statistical test for these predicted effects requires isolating a proportionally small effect in a wilderness of natural variation over an extended time period.

Thus there is a considerable statistical challenge in establishing the effect of gun market regulations on the outcomes of ultimate concern—rates of homicide and criminal misuse of guns. The direct evidence on efficacy is likely to be imprecise (as in the evaluation of the Brady Act) or ambiguous. Given that reality, the best alternative is not to fall back on pure intuition, but rather to consider evidence on how regulations affect the relevant transactions. For example, Brady background checks have blocked the sale of about 2 million firearms since 1994, most commonly because the would-be purchaser had a felony record.²⁶ We do not know how many of those would-be buyers found another source or what they did with it, but it is at least plausible that some portion of those blocked sales saved lives.

D. Summing Up on Availability

My conclusions from my analysis in 1979 have been supported and contested in the years since. At this point I am confident in the following conclusions: the prevalence of gun ownership in a community has a direct effect on weapon choice by robbers and assailants—more guns, more gun use in crime. The prevalence of gun ownership has little or no effect on the overall volume of violent crime—more guns, same amount of violence. But the lethality of that violence depends on the mix of weapons—more guns, more murders.

The link between gun prevalence and gun use in crime suggests that criminals generally find it easier to obtain a gun in a gun-rich com-

²⁶ In 2006, 1.6 percent of the 8.6 million applications for firearm transfers or permits were denied by the FBI (69,930) or by state and local agencies (64,512; <http://bjs.ojp.usdoj.gov/content/pub/pdf/bcft06st.pdf>).

munity than in one where guns are scarcer. That speculation receives support from a variety of sources. What is not so clear is whether regulations on the gun market and gun possession can have any meaningful effect on the availability of guns. Even the prohibitions on handgun ownership in Chicago and the District of Columbia (both now deemed unconstitutional) do not appear to have had a large effect on the prevalence of gun ownership (Cook and Ludwig 2006*b*). In both cases, residents could readily purchase guns in neighboring jurisdictions. A national ban might well have greater effect.

V. Gun-Oriented Enforcement

The debate over gun control is typically focused on where to draw the line. What sorts of weapons should be banned in the civilian market? What categories of people should be banned from possession? What places should be designated gun-free? But since regulations, however defined, are not self-enforcing, the questions of implementation and enforcement are also crucial in determining their ultimate success in separating guns from crime.

Design and enforcement of gun regulations are large topics, but my discussion here will be limited to introducing two (overlapping) sets of issues that have received a good deal of attention in recent years: focused deterrence and gun-oriented police patrol.

A. Focused Deterrence

One noteworthy approach to deterring illicit carrying and use has been to threaten convicted felons with federal prosecution if they are arrested in possession of a gun. Since federal law specifies longer prison sentences for “felon in possession” convicts than do state laws, involving the “feds” in such cases might well have a deterrent effect on this high-risk group. A federal program called Project Safe Neighborhoods was implemented during the late 1990s with federal-local cooperation in prosecuting such cases as a key element.

The focus on felons is an example of “focused” or “targeted” deterrence. Those who have already been convicted of a felony most certainly constitute a relatively high-risk group, although they do not account for as much of the serious violence as is widely believed. Ludwig, Braga, and I analyzed murder defendants in Chicago and found that just 40 percent of the adult defendants had a felony conviction (Cook,

Ludwig, and Braga 2005)—far higher than the prevalence of felons in the general population (so collectively they are “high-risk”), but with the implication that well over half of murders are committed by people who lack a felony record.

The prominence of the federal prosecution strategy owed much to the publicity given Project Exile in Richmond, Virginia. This partnership between local prosecutors and the US Attorney was implemented in 1997; the subsequent drop in murder rates was widely credited to the deterrent effect of this program, although a careful look at the evidence suggests that that claim is dubious at best (Raphael and Ludwig 2003). However, a reputable evaluation of Project Safe Neighborhoods in Chicago found evidence of a remarkably large deterrent effect in a couple of high-violence neighborhoods. A key element of this project was the threat of long prison sentences for felons in possession. That threat was delivered in notification sessions with small groups of convicts (Papachristos, Meares, and Fagan 2007).

The best known of the focused-deterrence strategies to reduce illicit gun use is Boston’s Operation Ceasefire. Beginning in 1995, an interagency working group composed of Harvard University researchers, members of the Boston Police Department, and other criminal justice agencies conducted research and analysis on Boston’s youth violence problem, designed a problem-solving intervention to reduce youth violence, and implemented the intervention. The research showed that the problem of youth violence in Boston was concentrated among a small number of serially offending gang-involved youths (Kennedy, Piehl, and Braga 1996). The key problem-solving intervention that arose from the research diagnoses was to prevent gang violence by making gang members believe that gun use by any one member of the gang would result in legal problems for all members. The intent was to create an incentive for gang members to discourage each other from gunplay, thus reversing the usual group norm in support of violence. A key element of the strategy was the delivery of a direct and explicit “retail deterrence” message to a relatively small target audience regarding what kind of behavior would provoke a special response and what that response would be. The deterrence message was delivered by talking to gang members on the street, handing out fliers in the hot spot areas explaining the enforcement actions, and organizing forums between violent gang members and members of the interagency working group (Kennedy 2011). An evaluation of the Boston strategy to

prevent youth violence found it to be associated with significant decreases in youth homicides, shots fired, and gun assaults (Braga et al. 2001; Piehl et al. 2003).²⁷ Several replications of this general approach have been evaluated, with generally positive results (Braga and Weisburd 2012).

B. Gun-Oriented Police Patrol

Police practice has been greatly influenced by recognition of the strategic implications of the geographic concentration of crime and violence within cities. Concentrating police activities in the high-crime areas (“hot spots”) can be an efficient use of available police personnel, in part because displacement to other neighborhoods does not appear to be much of a problem (Clarke and Weisburd 1994; Weisburd and Telep 2012). Lawrence Sherman demonstrated the feasibility of directed patrol against gun violence hot spots in his well-known demonstration project in Kansas City (Sherman and Rogan 1995). Since then there have been positive evaluations of similar directed-patrol programs of short duration in Indianapolis and Pittsburgh, as well as two cities in Colombia (Koper and Mayo-Wilson 2006). While there have been no randomized controlled trials of this approach, the quasi-experimental evidence suggests that stepped-up police activity directed at illicit gun carrying can have a deterrent effect.

This approach has been adopted most visibly by New York City, where police officers conducted almost 700,000 stops in 2011 alone, mostly with youthful minority males. While the “yield” with respect to confiscated guns has been low, it is reasonable to believe that this tactic has had a deterrent effect on illicit carrying and gun use in crime—albeit at some cost in terms of police-community relations. We know that New York City enjoyed an extraordinary and sustained drop in violence since the early 1990s and that that drop was associated with a number of policing innovations (Zimring 2011). It is difficult to sort out the separate contribution of the stop-and-frisk policy.

²⁷ Other researchers, however, have observed that some of the decrease in homicide may have occurred without the Ceasefire intervention in place, as violence was decreasing in most major US cities (Fagan 2002; Rosenfeld, Fornango, and Baumer 2005). The National Research Council’s Panel on Improving Information and Data on Firearms (Wellford, Pepper, and Petrie 2005) concluded that the Ceasefire evaluation was compelling in associating the intervention with the subsequent decline in youth homicide. However, the panel also suggested that many complex factors affect youth homicide trends, and it was difficult to specify the exact relationship between the Ceasefire intervention and subsequent changes in youth offending behaviors.

In any event, it should be noted that the potential effectiveness of targeted patrol against illicit carrying depends on the regulatory environment. If carrying a concealed gun does not require a permit (as in four states), then the goal of “getting guns off the street” is unattainable.

C. Other Enforcement Priorities

There is obviously much more to the “enforcement” question than efforts to deter dangerous people from carrying and using guns. As developed in my review with Ludwig (Cook and Ludwig 2006*b*), we can organize the larger discussion around two general approaches: making guns a liability to offenders or making guns more costly or less accessible. The enforcement strategies discussed above amplify the liability by increasing the perceived likelihood and severity of punishment to those who choose to misuse a gun (relative to some other weapon). There are other actions that could further penalize gun misuse, including a variety of measures that would improve record keeping so that police investigations could be more productive in associating a particular gun with a particular crime and individual. California is a leader in this regard with its handgun registration requirement and pending requirement that for new pistols the firing pin stamps the cartridge with a registered serial number. The other general approach, reducing gun availability, can be pursued through stronger regulatory enforcement of dealers, limitations on the number of guns sold per customer (such as the one handgun per month limit in several states), increased policing of the underground market in guns, and a number of other approaches.

This sort of strategic analysis is potentially useful even if direct estimates of the quantitative effects are lacking. For policy design purposes it is important to have a sense of what general mechanisms are likely to be effective since it is not possible to conduct gold-standard evaluations of the myriad possible interventions.

VI. Self-Defense and Private Deterrence

When I started my career-long research project on weapons and violence, there was little discussion of self-defense in the social science literature. Still, the fact was (and is) that most private citizens who acquired a handgun did so at least partly for self-defense purposes, and

it was natural to ask whether guns were valuable in that regard. Researchers began looking into various aspects of this matter during the 1980s, and in subsequent years that issue has come to dominate the literature and much of the public rhetoric. The pro-gun groups have gone on the offensive, asserting that gun control measures that deprive private citizens of handguns perversely deprive them of an effective means of protecting their homes and communities. These advocates can now point to research findings that support this perspective. And in the *Heller* decision of 2008, the majority of the Supreme Court announced a Second Amendment right to keep a handgun in the home for protection.

Research on self-defense covers a number of issues: the frequency and success with which guns are used in self-defense, the hazards of keeping a gun in the home, and the deterrent effect of increasing the number of potential victims who are armed. It comes as no surprise that on each of these issues there is considerable disagreement in the social science literature.

A. How Many Defensive Gun Uses (Redux)?

While far from perfect, the NCVS is generally viewed as the best survey source for crime-related estimates. The NCVS questionnaire follows up on crime reports by asking respondents whether they acted to defend themselves. Using the NCVS data from the 1980s, I found that only about 1 percent of robbery victims attempted to use a gun in self-defense, as did 3 percent of victims of burglaries of occupied homes (Cook 1991). The overall NCVS estimate was on the order of 100,000 DGUs per year. As recounted in a previous section, Kleck reported the results of several smaller, one-time surveys to the effect that there were millions of DGUs per year (Kleck 1988; Kleck and Gertz 1995). And he is not alone: estimates in the millions are routine from this sort of unbounded survey.

We have learned from this literature that the wording of survey questions, the sequence in which they are presented, and other details of survey design can affect the estimate of DGUs by a factor of 20 or more. In my view the only way to anchor this discussion is to make commonsense comparisons with other statistics that are more reliable, such as the number of people who are shot each year and the volume of serious violent crime.

TABLE 2
The Likelihood of Victims Using a Gun in Self-Defense

Type of Personal-Contact Crime	DGUs/Crimes Reported in NCVS, 1992–2001	Unweighted %
All crimes with personal contact	247/27,595	.9
Robbery	32/2,640	1.2
Assault	166/21,570	.8
Confrontational burglaries	50/1,821	2.7
Sexual assaults	1/1,119	.1

SOURCE.—Computed from table 2 of Tark and Kleck (2004).

B. Are Victims Well Advised to Use a Gun in Self-Defense If They Have One Handy?

In an early analysis of this issue using NCVS data, I found that when a victim chooses to resist an assailant, using a gun is associated with a better outcome than resisting without a weapon.²⁸ That result could be considered as supporting the benefit of having a gun for self-defense, but as a logical matter, it provides little information on whether the gun itself was helpful. One problem is that the NCVS did not at that time provide the detailed information about the sequence of events that would be necessary to determine the meaning of the injury rates (Cook 1986).

Sequence information was incorporated in the NCVS following a revision of the questionnaire in 1992. Respondents who reported a crime against their person were asked about self-defense measures and injury; if they reported being injured, they were asked whether the injury occurred before, during, or after their self-defense effort. Jongyeon Tark and Gary Kleck analyzed all personal-contact crime incidents reported in the NCVS between 1992 and 2001, distinguishing among 16 different types of self-defense, including “attacked with gun” and “threatened with gun.” The sum of those two actions accounts for less than 1 percent of all personal-contact crimes. Table 2 reports the frequency of DGUs by crime category. The numbers of DGUs are far lower than suggested by Kleck’s own surveys (leading, e.g., to the 2.5 million DGU estimate) and are in line with my earlier estimates. In this article, Tark and Kleck say that they think that “many cases of

²⁸ Those who resist with a knife do as well as those who use a gun.

armed resistance are probably not reported to the NCVS” (2004, p. 869).

There remains the question of whether resistance is associated with a greater chance of injury at the hands of the assailant. Tark and Kleck report the likelihood of injury to the victim-respondent following resistance by type of crime. They find that most injuries occur before any attempt at resistance, and injury following resistance is quite rare. On the basis of counts of self-reports in the 10 years of NCVS data, without applying sampling weights, those who used a gun to defend themselves had twice the rate of subsequent injury (3.6 percent) as those who used another type of weapon (1.8 percent) and about the same rate as those who fought back without a weapon (3.4 percent). For all three categories the percentage who were seriously injured was just 0.6 percent.

It appears, then, that injury following self-defense is unusual and that there is no advantage in that respect from using a gun in self-defense. (The authors also analyze these patterns using multiple regression analysis but find that the numbers are too small to find significant differences among type of defense.)

Somehow the authors conclude that “victim resistance appears to be generally a wise course of action” (Tark and Kleck 2004, p. 861). It is a strange conclusion for two reasons. First, they do not have a sound basis for comparing the causal effects of resisting versus not resisting. Assaults that engender resistance are systematically different from those that do not and in particular suggest a difference in victims’ judgment concerning the best course of action given their assessment of the assailant’s intent and strength. Second, the authors ignore a key fact about the NCVS, which is that it excludes cases in which the victim is killed. If resistance enhances the chance of getting killed, which it may, then this advice seems ill founded indeed.

In my view, then, there still is no basis from the NCVS statistics for judging whether resisting a robber, home intruder, or other assailant is generally a prudent course of action if the goal is to minimize the chance of serious injury or death.

C. Does Keeping a Gun in the Home Protect the Occupants?

The risks of keeping a firearm at home include accidental shootings, suicide, and use in intimidation and murder in battering relationships. In a particularly telling analysis, Hemenway (2011, table 2) compared

the 15 states with the highest rates of gun ownership with the six states with the lowest rates. The two groups each had about 25 million people in 2004, but the high-gun states had 11 times as many unintentional firearm deaths and 12 times as many gun suicides. The nongun suicide rate was just 1.5 times as high in the high-gun states.

Guns are also perceived by many as reducing one risk to household members, injury at the hands of an intruder. A number of studies have compared the likelihood that a gun kept at home will be used to shoot an intruder with the likelihood that it will be used to shoot a household member (in suicide, assault, or accident). The latter is far more likely. Unfortunately, most studies do not measure the frequency with which guns kept at home are used to scare off an intruder without shooting him. The best national estimates of the frequency of defending against intruders come from the NCVS data. I found that in about 3 percent of home invasion crimes in the 1980s, a gun was used by a household member in self-defense, not always successfully (Cook 1991). That amounted to about 30,000 instances per year. Tark and Kleck (2004) report a very similar rate (2.7 percent) of DGU against home invasion for the period 1992–2001. Since the rate of gun ownership during those periods was over 35 percent, it appears that gun-owning households are unlikely to use their guns when there is a home invasion and very unlikely overall (about one in 1,000 in a year).

Keeping a gun at home has other benefits, including recreational benefits from hunting, target shooting, and collecting, and instrumental benefits such as shooting pesky woodchucks on the farm. All those uses are compatible with safe storage practices that will reduce the chance of accidental misuse. But those who keep a loaded handgun accessible to fend off intruders are buying their sense of security at a price in terms of the risks incurred, especially if there are children at home, or violence-prone adults, or anyone who abuses drugs or is suicidal. The *Heller* decision has given us the right to keep that loaded handgun at home, but that does not mean it is a good idea.

D. Does Private Gun Ownership Deter Crime?

The strongest claim in support of the public virtue of widespread gun possession (and the perversity of regulations that curtail guns) is that guns in private hands generate a general deterrent effect on crime. Early arguments along these lines speculated about the effect on residential burglary, and especially “hot” burglaries of occupied homes

(Kleck 1997; Kopel 2001). The first systematic analysis of this issue (Cook and Ludwig 2003) demonstrated by use of the geo-coded NCVS data that the individual likelihood of residential burglary or hot burglary is not reduced by living in a county with high gun prevalence.²⁹ To the contrary, we found that greater gun prevalence caused an increase in the residential burglary rate. One reason may be that more prevalent gun ownership increases the profitability of burglary because stolen guns are readily fenced for good prices. The fraction of burglaries that are hot is not affected by the prevalence of gun ownership.

By far the most prominent research findings on the “general deterrence” issue were based on an evaluation of changes in state laws governing concealed carrying of handguns. Over the 1980s and 1990s a number of states eased restrictions on concealed carry, adopting a regulation that required local authorities to issue permits to all applicants who met minimum conditions. These “shall issue” laws replaced “may issue” laws (which gave the authorities discretion) or outright bans. Economists John Lott and David Mustard published the first evaluation of these shall-issue laws, finding that they were associated with a reduction in homicide and some other types of crime (Lott and Mustard 1997). Lott went on to publish *More Guns, Less Crime* (1998), in which he reported these results and variations on them. He reached differing conclusions about the effect on property crime depending on how he specified his regression equations (Cook, Moore, and Braga 2002), but in every econometric specification he found that ending restrictive gun-carrying laws reduced homicide rates (Lott 1998, pp. 90, 100).

In the finest scientific tradition, a number of analysts have sought to replicate Lott’s findings and confirm or disconfirm them. For example, economist John Donohue (2003) concluded that Lott’s findings are unsupported from the data he used. Donohue shows that Lott’s estimates are sensitive to the correction of several coding errors and to reasonable changes in the model specification. More importantly, Donohue’s reanalysis of the Lott data shows that states that eventually ended restrictive concealed carry laws had crime trends systematically different from those of the other states even before these law changes went into effect, suggesting that the adoption of these laws could not

²⁹ Note that this is the first and perhaps only use of geo-coded data, made possible by the Duke Census Data Research Center.

be considered exogenous to the process generating homicide rates. Donohue and his coauthors have published several additional evaluations of the shall-issue laws, taking advantage of additional years of data and exploring alternative specifications and data sets for the period 1977–2006 (Ayres and Donohue 2009; Aneja, Donohue, and Zhang 2012). One robust result from the most recent work is that the introduction of shall-issue laws is associated with an increase in aggravated assault rates.

The importance of this academic debate is indicated by the fact that a panel of 18 distinguished scholars was created by the National Research Council to review the conflicting research. Panelists were chosen because they had not been directly involved in research related to gun control. Among other things, this panel reanalyzed Lott's data and, with one dissent (by a political scientist who was not expert on the statistical methods used), judged his findings to be unreliable (Wellford, Pepper, and Petrie 2005).

In a sense, the claim of a large deterrent effect should have been challenged from the beginning as too good to be true. Whether the net effect of relaxing gun-carry laws is to increase or reduce the burden of crime, there is very good reason to believe that that effect is not large. One study found that in 12 of the 16 permissive concealed carry states studied, fewer than 2 percent of adults had obtained permits to carry concealed handguns (Hill 1997). The actual change in gun-carrying prevalence is smaller than the number of permits issued would suggest because many of those who obtained permits were already carrying guns in public (Robuck-Mangum 1997). Moreover, the permits issued were concentrated in rural and suburban areas where crime rates are already relatively low, among people who are at relatively low risk of victimization—white, middle-aged, middle-class males (Hill 1997). The available data about permit holders also imply that they are at fairly low risk of misusing guns, consistent with the relatively low arrest rates observed to date for permit holders (Lott 1998). In sum, changes to state laws governing legal gun carrying were unlikely to induce more than negligible change in the incentives facing criminals to go armed themselves or to avoid potentially armed victims.

What is the lesson? As in the case of Kleck's estimates of the number of DGUs, Lott's remarkable findings have received enormous attention simply because they provide academic support for pro-gun advocates. In both cases the authors have good credentials and are using methods

that are quite standard in social science. That those methods in this case are producing results that are so at odds with what else we know is good reason to be skeptical. The case for skepticism is stronger yet given that those findings are not “robust”: seemingly minor changes in survey methods or econometric analysis produce qualitatively different results. The scientific process has worked quite well in this case since replication has challenged dubious findings, just as in the case, say, of the “discovery” of a desktop cold-fusion process in 1989 by Utah chemists. That also seemed too good to be true and turned out to be so after many other labs attempted and failed to replicate the results. But the public debate over public safety and guns has been ill served by the selective attention to results that provide support for predetermined positions.

VII. Conclusion

When I was just 20 years into my career as a gun control researcher, already all too familiar with the quality of the public discourse on the subject, my colleague Jim Leitzel did me the great favor of introducing me to Albert Hirschman’s (1991) book *The Rhetoric of Reaction* (Cook and Leitzel 1996). Hirschman observes that in a two-century history of debate over progressive reforms, there were three common themes used by conservative opponents: that the reform would have unintended negative consequences, would have no effect on the problem, and would come at the cost of fundamental rights or values. His subtitle, then, was *Perversity, Futility, Jeopardy*. That was a good overview of the arguments made by opponents of gun control then and is an even more apt summary today.

The “futility” argument was the primary basis for the critique of gun control by scholars in the 1980s, and it continues to be repeated; in this view, the “bad guys” will always have ready access to guns no matter what the regulatory structure because underground markets are so effective at circumventing whatever regulations are in place in the primary market. The belief in the power of markets, both licit and illicit, is coupled with a view of the criminal as a determined and resourceful person who “if he really wants to get a gun” will find a way to do so. An alternative version of the futility argument is that this self-same determined and resourceful criminal will find a way to com-

mit his crimes and murders regardless of what weapons are available to him—that what matters is intent, not the instrument.

The “perversity” argument is somewhat newer among gun researchers but has become an important link between research and rhetoric. As recounted above, Kleck and Lott, among others, provided the empirical grist for the rhetorical mill. Kleck reported that guns were frequently and effectively used in self-defense and hence had great potential value to the individual. Lott reported that relaxing the regulations on concealed gun carrying created a powerful deterrent to all kinds of crime. One apparent implication, if these findings are believed, is that regulations that limit gun possession and use may have the perverse effect of depriving “law-abiding” citizens of an important means of fending off assailants while depriving communities of the deterrent effect of a heavily armed citizenry.

The “jeopardy” argument has of course been given zest by the Supreme Court’s discovery of a personal right to keep a loaded handgun in the home. However the court ultimately defines the scope of this new freedom, the 2008 *Heller* decision has encouraged the popular belief in the armed citizen as the frontline defense against criminal predation and, in a more radical vision, against government tyranny (Horwitz and Anderson 2009).

Can we hope that the scientific process will ultimately succeed in sorting through conflicting claims and counterclaims, at least on those issues (futility and perversity) that are largely a matter of fact rather than personal values? For lawmakers, regulators, judges, and the public at large, it is hard to discern who has a better claim to the truth in the welter of technical arguments. But in the scientific forum, perhaps it is not unrealistic to aspire to a reality-based discourse in which scientific norms prevail. Those scientists who are conscientious objectors to the Great American Gun War are invited to join the Great American Gun Research Project. There is much to be learned, and perhaps the learning will ultimately have a constructive influence on policy making in this vital arena.

TABLE A1
Influential Contributions on Gun Policy

Year of Publication	Citation	Comments
1968	Franklin Zimring, <i>Journal of Legal Studies</i>	Criminology: the first systematic study of the “instrumentality” effect of weapon type; more generally, the first empirical scholarship on the harmful role of guns in criminal violence
1979	Philip Cook, <i>Policy Studies Review Annual</i>	Economics: demonstrates that the prevalence of gun ownership has a direct positive effect on weapon mix in robbery and the robbery murder rate
1980	Susan Baker, Stephen Teret, and Elliott Dietz, <i>Journal of Public Health Policy</i>	Public health: argues for the importance of regulating guns (rather than focusing only on criminal enforcement) to reduce injury and death
1983	James Wright, Peter Rossi, and Kathleen Daly, <i>Under the Gun</i>	Sociology: a skeptical review of evidence on the importance of guns in crime and the possibilities of gun control
1986	Arthur Kellermann and Don T. Reay, <i>New England Journal of Medicine</i>	Public health: presents evidence that keeping a gun in the home increases the chance of violent death for residents
1989	Sanford Levinson, <i>Yale Law Journal</i>	Law: an influential early contribution to the literature making the case for the Second Amendment as a source of a personal right to keep and bear arms
1991	Gary Kleck, <i>Point Blank: Guns and Violence in America</i>	Sociology: review of the evidence on guns and violence with a theme that weapon type makes little difference for crime rates and outcomes but does matter in self-defense

1994	Garen Wintemute, <i>Ring of Fire: The Handgun Makers of Southern California</i>	Public health: detailed inquiry into the design and marketing of cheap, low-quality handguns
1995	Gary Kleck and Marc Gertz, <i>Journal of Criminal Law and Criminology</i>	Sociology: reports often-repeated estimate that there are 2.5 million defensive gun uses per year
1996	David Kennedy, Anne Piehl, and Anthony Braga, <i>Law and Contemporary Problems</i>	Criminology: reports the development and effects of the Boston Gun Project, an innovative approach to reducing gun use by gangs through deterrence
1997	Franklin Zimring and Gordon Hawkins, <i>Crime Is Not the Problem</i>	Criminology: provides a variety of evidence indicating that the United States is not exceptionally violent compared with other developed nations but has a high murder rate due to widespread gun use
1998	John Lott, <i>More Guns, Less Crime</i>	Economics: reports econometric estimates suggesting that easing restrictions on gun carrying reduces all types of common crime
2000	Philip Cook and Jens Ludwig, <i>Gun Violence: The Real Costs</i>	Economics: reviews alternative conceptions of the social cost of gun violence and provides a new estimate based on a national contingent-valuation survey
2004	David Hemenway, <i>Private Guns, Public Health</i>	Public health: comprehensive account of the evidence concerning the effects of widespread gun ownership on injury rates and self-defense
2005	Charles Wellford, J. V. Pepper, and C. V. Petrie, <i>Firearms and Violence: A Critical Review</i>	National Research Council: review of the literature on gun violence by a scholarly panel that concludes that more research is needed to resolve disputes in the field
2009	David Hemenway et al., <i>American Journal of Preventive Medicine</i> .	Public health: a brief history of the Violent Death Reporting System, developed by the authors and implemented by CDC

TABLE A2
Additional Statistics from Tark and Kleck

Type of Self-Protection Action	Number of Reports in the NCVS Sample	Percentage Injured Following Self-Protection Action	Percentage Seriously Injured Following Self-Protection Action
Attacked or threatened with gun	166	3.6	.6
Attacked or threatened with other weapon	337	1.8	.6
Attacked without weapon	2,146	3.4	.6
Ran away, hid	3,179	1.6	.3
Argued, reasoned, pleaded	2,146	2.9	.2

SOURCE.—Computed from table 2 of Tark and Kleck (2004).

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