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THE FINAL BULLET IN THE BODY OF THE MORE GUNS, LESS CRIME HYPOTHESIS

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In 1997, John Lott and David Mustard launched what has come to be one of the most remarkable tales in the history of public policy evaluation when they announced that laws permitting citizens to carry concealed handguns—so-called right-to-carry (RTC) laws—caused crime to fall. Hailed as heroes by the National Rifle Association (NRA) and its supporters, while derided as scoundrels by their staunchest critics, Lott and Mustard precipitated a scholarly and political odyssey that can teach us much about the techniques and limitations of sophisticated empirical research and the divergent norms of the scholarly and political realms.

THE THEORY DISPROVED

Lott and Mustard theorized that allowing nonfelons who were not mentally ill and were willing to pay a permit fee to lawfully carry guns would serve to reduce crime because criminals would be more frequently thwarted by the armed resistance of potential victims or onlookers.¹ Skeptics immediately pointed out that the benefits of legitimate defensive use of guns by certain members of the public could well be outweighed by illegitimate uses, but ultimately, the question was an empirical one—would RTC laws increase or decrease crime? Although Lott and Mustard's research was quickly denounced by some as unscientific nonsense, this criticism was unfair in that Lott and Mustard had taken a reasonable first step in trying to ascertain the effect of an RTC law by creating a panel data set of crime across all 50 states over the period from 1977 to 1992 while using a fixed effects model to test whether RTC laws had any statistically significant effect on crime. Indeed, taken at face value (which we have now learned can be highly misleading), the first cut seemed to suggest exactly what Lott and Mustard said it did—that RTC laws reduced at

1. Under the Texas RTC law, prior commitment to a psychiatric care facility or indeed any past psychiatric problem is not disqualifying as long as a licensed psychiatrist will state that the "condition is in remission and is not reasonably likely to develop at a future time." Texas Department of Public Safety, http://www.txdps.state.tx.us/administration/crime_records/chl/faq.htm.

least some categories of violent crime.²

With the benefit of hindsight (and much subsequent scholarly analysis on more complete and new data), one can now state rather confidently that “the first cut” was wrong—RTC laws do not reduce crime. There is even statistical support for the view that RTC laws may actually increase crime, but further work is needed to sort out whether this evidence merely illustrates weaknesses in the panel data models of crime or in fact captures the true effect of the laws (more about this below). Donohue (2003) and Ayres and Donohue (2003) extended the initial Lott and Mustard data set through 1999, probed the aggregated estimates that Lott and Mustard had previously championed, and revealed that their results were spurious. The basic problem was that Lott and Mustard’s data explored the impact of the adoption of RTC laws in 10 states starting in the second half of the 1980s, which was just about the time that the introduction of crack into certain urban areas led to a large increase in crime. States that adopted the laws tended to have less of a crack problem, and therefore, what Lott and Mustard thought to be the restraining effect on crime of RTC laws was more plausibly the product of omitted variable bias owing to the inability to control for the criminogenic influence of the introduction of crack cocaine. An early review of Lott’s book, *More Guns, Less Crime* by Ayres and Donohue (1999) noted that if the crack-cocaine explanation for Lott and Mustard’s initial results were correct, one would expect to see larger drops in crime in the 1990s in the states that had previously experienced the large crack-induced crime increases. The subsequent work by Ayres and Donohue extending the Lott and Mustard data set through 1999 showed this to be the case (and the greater crime drop in the 1990s in nonadopting states holds true whether one looks at raw crime data or regression models controlling for the explanatory variables used by Lott and Mustard).

Specifically, although the 22 states that had not adopted RTC laws (through 1999) had substantially higher rates of violent crime, robbery,

2. Even apart from the usual disclaimers that association does not prove causation, Lott and Mustard’s initial work contained important anomalies. There was no evidence that robbery declined, which cut powerfully against their thesis, because robbery is the crime most commonly committed outside, where a concealed gun would be expected to have its greatest potential benefit. Moreover, Lott and Mustard vacillated on whether RTC laws increased property crime, which they tried to explain as the result of criminals shifting away from robbery to crimes where they would not directly confront their victims (note again the centrality and anomaly of the robbery results, which conflict with the more guns, less crime thesis). Moreover, as historian Randolph Roth (2002) notes about Lott’s initial study, Lott “biases his results by confining his analysis to the years between 1977 and 1992, when violent crime rates had peaked and varied little from year to year. . . . Had Lott extended his study to the 1930s, the correlation between guns laws and declining homicide rates that dominates his statistical analysis would have disappeared.”

and aggravated assault in 1992 than did the RTC states, this difference had been considerably narrowed by 1999. The pattern can be seen in Figure 1, which shows the robbery rates for the 22 nonadopting states, and for the three groupings of RTC states by date of adoption of their RTC laws—before 1977, between 1978 and 1989, and between 1989 and 1999. Note that of the four groups of states, only those without RTC laws experienced major declines in robbery over the 1977–1999 period. Indeed, the 22 nonadopting states had the highest rates of rape and property crime at the beginning of the 1977–1999 period but the lowest rates by the end of that time period. Although other factors undoubtedly explain why the non-RTC states had such large decreases in rape and property crime relative to RTC states, the relative crime patterns illustrate the uphill battle that exists for anyone trying to assert that RTC laws reduce crime.

Kovandzic and Marvell have now put the final bullet in the body of the more guns, less crime hypothesis. What makes their paper interesting and important is that, unlike Lott and Mustard as well as Ayres and Donohue whose primary work used panel data models across all 50 states with the date of adoption of the RTC law being the explanatory variable of interest, Kovandzic and Marvell looked at actual concealed carry permits by county to identify the effect on crime of the RTC law adopted in 1987 in Florida, a state that Lott and Mustard considered to be highly supportive of their thesis.³ Kovandzic and Marvell collected county data on crime and concealed handgun permits across Florida from 1980 to 2000 and concluded, “we find no credible statistical evidence that increases in permit rate growth (and presumably more lawful gun carrying) leads to substantial reductions in violent crime, especially homicide. Similar to Ayres and Donohue (2003), we find that our best, albeit admittedly imperfect, statistical evidence indicates that increases in permit rate growth may actually lead to slight increases in crime.”

SCHOLARLY TRIUMPH AND POLITICAL FAILURE?

The addition of Kovandzic and Marvell’s article underscores that the weight of the evidence is now firmly behind those who have found that RTC laws do not reduce, and may even increase, the overall level of crime. Thus, if the story were confined to the academic realm, it would seem to be a relatively happy one. In 1997, Lott and Mustard gave great prominence to an issue that was not widely known in the scholarly world—the

3. Indeed, Ayres and Donohue (2003) estimated state-specific effects, which suggested that Florida was one of the few states for which crime did drop significantly after the adoption of a RTC law, although there are reasons to believe that the crime drop was caused by other factors (such as the ultimate decline following the enormous crime run up induced by the Mariel boat lift of the early 1980s).

NRA-led initiative to seek adoptions of state RTC laws—as they used a panel data set to provide the first step in analyzing the impact of these laws. Their strong conclusion that the laws reduced crime was counterintuitive enough and soon seen to be politically salient enough that numerous other researchers stepped in to evaluate their data, which the two researchers creditably shared broadly. The first stage of this process of reanalysis proved to be inconclusive: One set of researchers pointed out potential problems in the analysis and interpretation of Lott and Mustard's 1977–1992 data set, whereas other researchers concluded that Lott and Mustard's initial results seemed robust to differences in specification and inclusion or exclusion of various explanatory variables.⁴ In the second and perhaps final stage in the process of reevaluation, researchers, including Kovandzic and Marvell in this paper, have been able to show with the benefit of more complete data and/or superior econometric techniques that the initial Lott and Mustard findings of crime reduction were largely spurious.⁵

Unfortunately, though, there is a dark side to this story. During the six years it took for the scholarly community to fully discredit the more guns, less crime hypothesis, the Lott and Mustard research had a major influence on public policy as a number of states adopted RTC laws recently with legislators touting the research of Lott as alleged proof that their action will cut violent crime.⁶ Some may argue that Lott and Mustard's academic research was only window dressing and that it did not change any legislative outcomes, but this may be too optimistic a conclusion. At the very least, Lott's research and subsequent lobbying efforts gave cover to those who might have been reluctant to support RTC laws and emboldened their supporters to push harder for such laws. Indeed, Attorney General John Ashcroft asked the U.S. Supreme Court to adopt a more NRA-friendly interpretation of the Second Amendment using Lott's research as "proof" that more guns would lead to less crime. In addition,

4. Among the articles not written by Lott and Mustard that support the more guns, less crime thesis are Benson and Mast (2001) and Moody (2000).

Articles that disagreed with the Lott and Mustard findings include Black and Nagin (1998), Ludwig (1998), Zimring and Hawkins (1997), Dezhbakhsh and Rubin (1998), and Duggan (2001).

5. See also Willard Manning (2003) (suggesting that correcting Lott and Mustard's results for autocorrelation would render all of their results statistically insignificant).

6. From 1996 to 2000, there were no adoptions of RTC laws but since then, Michigan adopted such a law in 2001, and Missouri, New Mexico, Minnesota, and Colorado all followed suit in 2003, with other states actively considering adoption. Alaska, which already has a RTC law that requires those wishing to carry guns to secure a permit, has now adopted a law allowing anyone who can lawfully carry a firearm to do so without a permit.

Lott has inspired an entire cadre of gun-toters to believe that they are responsible for one of the most important benign trends in crime in American history (the large crime drops of the 1990s), even though the yet larger crime drops in the states that did not adopt the RTC laws should show the folly of that belief. As pro-gun groups like Guns Save Lives.com have sprouted across the country, these excitable and engaged (and armed) supporters of Lott's work have been highly resistant to the refutations of the more guns, less crime thesis, and they have been energized to greater political activity on behalf of the NRA agenda. Of course, if RTC laws are harmful and Lott and Mustard's now discredited work has led to their greater adoption, then Lott and Mustard have imposed serious costs on the victims of the increased crime. Conversely, if the RTC laws have virtually no effect on crime but legislators voted for them thinking that they lowered crime, then at least there would be no blood on Lott and Mustard's hands, but there would still be the harm to the democratic process of encouraging the adoption of laws on false pretenses (however innocent the erroneous findings originally were).

Thus, we have conflicting lessons from this episode. The benign lesson in the scholarly realm is that those who ask interesting and important questions may help stimulate the ultimate attainment of truth even if they themselves generate the wrong initial conclusion.⁷ The lesson in the political realm, though, is far more malign. At least until the truth emerges—and perhaps even after it has become clear to open-minded scholars—those in the political realm who wish to push a particular agenda will do so as soon as a superficially supportive academic study hits the stands. Even after the study has been discredited, it may still have the capacity to provide cover for supporters of the erroneous conclusion, and it may still be cited and adamantly defended by fellow travelers.

Legislators and policymakers must keep in mind that it is very difficult to ascertain the effect of a law on a complex social phenomenon such as crime, and that regardless of the sophistication of the study, no one should have complete confidence in any study that has not been fully vetted by independent scholars preferably with both more complete data and better methods (as in the Ayres and Donohue paper) as well as using wholly different data and analytical approaches (as in the Kovandzic and Marvell study). Indeed, on at least three occasions I have found serious coding

7. "Mr. Lott's 1997 paper on gun policy was, "to that point, the most important piece of empirical research that has ever been done in the social sciences," says Jeffrey S. Parker, a professor of law at George Mason University. "I doubt that even Ayres and Donohue would dispute that point" (D. Glenn, 2003). I do think that Lott's work was important in that it stimulated the ultimate understanding that although RTC laws do not reduce crime, neither do they vastly increase it (because any overall crime increases are likely to be in the range of 1% to 2%).

errors in the work of John Lott, which, when corrected, cut strongly (and in some cases, overwhelmingly) against his thesis, which underscores the need for independent verification if the truth is to emerge.⁸ Unfortunately, one cannot expect coding errors to be captured during the process of peer review, and perhaps still more unfortunately, John Lott has neither conceded the existence of these errors nor tried to correct them.⁹

It is also important for the political and scholarly audiences to be sensitive to signs of overzealousness on the part of researchers, as this may give clues that something more than the search for truth is motivating the research.¹⁰ Because it is easy to make mistakes that can undermine one's

8. These coding errors are detailed in Ayres and Donohue (1999; 2003).

9. One article noted that "Lott also points out that because the claim of coding errors appears in a law review, it has not been subject to review by third-party scholars, as would have been the case in a peer-reviewed economics journal" (Glenn, 2003). But Lott does not need anyone else to evaluate the claim. He can simply look at the Ayres and Donohue paper and concede (or refute) the claim of coding error, and concede (or refute) that its correction eliminates his more guns, less crime result. The Glenn article then goes on to note that, "Six tables that derive from the same allegedly miscoded data set appear in Mr. Lott's new book, *The Bias Against Guns: Why Almost Everything You've Heard About Gun Control Is Wrong* (Regnery, 2003). James Lindgren, a professor of law at Northwestern University, says, "If Donohue and Ayres's account is as it appears—and I'm not in a position to judge that—then Lott should withdraw the book for revision." Indeed, Lindgren was the scholar who raised questions about academic misconduct on the part of Michael Bellisles, who resigned from Emory University amidst charges of academic fraud in his left-leaning gun research, as well as against John Lott, on claims that Lott may have made up a survey purporting to show that 98% of the time that guns are used defensively they are only brandished and not fired. As UCLA Professor Mark Kleiman has written, "If Lott were at a university, he would certainly be facing an inquiry into his professional ethics." http://www.markarkleiman.blogspot.com/2003_05_01_markarkleiman_archive.html#200233924

10. Moreover, Lott acted somewhat incongruously in dropping his name from his reply to my work with Ian Ayres on the eve of publication. Ayres and I showed that virtually every regression in Lott's reply to our paper in the *Stanford Law Review* was incorrect due to Lott's coding errors. As a result, when he took his name off the paper, we assumed that this meant he was conceding that his coding errors undermined the results in his reply. We now understand that he "stands by" the erroneous regression results, and that he claims to have removed his name because of a dispute that he had with the editors of the journal, about which we knew nothing prior to publication. The editors of the *Stanford Law Review* had told us that a couple of sentences in our very long paper had been changed after Lott's reply was complete and asked us to restore the original language. We did so without objection. We understand from the editors of the *Law Review* that there was some additional word that Lott wanted changed that they did not ask us to change and that this disagreement led him to remove his name. As we were not aware of the dispute between Lott and the *Stanford Law Review* editors on this matter, we did not know at the time that the offending word change was the correction of a typo replacing the word "price" with the correct word "crime." But more importantly, when someone's work is being identified as erroneous because of miscoding errors, one would think that the focus of attention should be directed at

analysis—I assume the three sets of coding errors were honest mistakes—it is important for scholars to quickly correct errors that they have introduced into political debates, and to be humble about pressing policy responses to their research until sufficient scholarly reevaluation has been completed. This can take time—six years in this case. It also suggests the wisdom of having sunset provisions attach to legislation when some of the supporting legislators vote based on empirical studies that have not yet been fully vetted.¹¹ Because a high proportion of these studies turn out not to withstand scrutiny, it does seem to be a blight on our democracy to have erroneous studies saddle the electorate with laws that would not have been adopted had the truth been known at the time of passage. As the eminent sociologist Otis Dudley Duncan has stated: “The Lott episode is just one incident in a seemingly inexorable trend toward eliminating professionally competent research from discussions of social policy or overwhelming it with junk science. If that is not halted the life blood of democracy itself will dry up. The people cannot make sensible choices without reliable information.”

EVALUATING KOVANDZIC AND MARVELL'S ULTIMATE POLICY RECOMMENDATION

After concluding that the best evidence seems to suggest either no effect on crime from RTC laws or a modest worsening in crime, Kovandzic and Marvell make the somewhat incongruous suggestion that RTC adoption may still be beneficial: “The main policy implication of this research is that there appears to be little gained in the way of violence prevention by converting restrictive gun carrying laws to “shall-issue” laws, although the laws might still prove beneficial by (1) making permit holders feel safer when out in public, (2) by providing permit holders with a more effective means of self-defense, and (3) by reducing the costs to police departments of enforcing laws prohibiting unlicensed gun carrying.” Although these points are certainly worth considering, they are not all compelling and in any event are incomplete as a list of the considerations relevant to the

either correcting the errors or showing that they do not exist. On this most crucial matter, we have heard nothing from Lott, and we are anxious to hear his response. This is particularly true because the same errors that are found in the paper from which he has removed his name also are found in his newly published book, and because he continues to lobby on behalf of concealed carry laws claiming that they will reduce crime, when his own regressions (when corrected) show that that is not true.

11. Indeed, absent reenactment, the federal ban on assault weapons that was adopted in 1994 will expire after 10 years in September 2004, so there is clear precedent for including sunset provisions in federal weapons bans (even if there is no similar precedent for sunset provisions in state pro-gun laws, which may be even more important given the emerging technology issue discussed below).

decision to adopt an RTC law. Clearly, as the evidence from seeing my three-year-old and six-year-old boys at play attests, some people really like guns. Moreover, when certain individuals—there is some evidence suggesting largely middle-class Republican men living in safe areas—feel threatened, they do seem to seek comfort by buying guns.¹² (Witness the large increase in gun purchases and the NRA's greater success in securing adoption of RTC laws in the wake of 9/11.¹³) Thus, Kovandzic and Marvell are probably right that permit holders may get some psychological comfort from being able to carry around their concealed weapons, but this tells us nothing about the psychological discomfort that others may feel in knowing that guns are all about them.¹⁴

But Kovandzic and Marvell's suggestion that carrying concealed weapons is a more effective means of self-defense would not seem to provide an argument in favor of RTC laws if their own study is correct. That is, if RTC laws increase the carrying of weapons and crime rises or does not fall, then either guns do not provide self-defense or they do for permit holders, while imposing greater burdens on others. The opportunity to shift crime burdens from one group to another (or worse yet to create more losers than winners) would hardly be a reason to endorse a program involving both public and private expense.

But is it clear how concealed handgun laws could increase crime even if only 1% or 2% of the public goes to the trouble of getting a concealed gun permit and that group seems not to have unusually high rates of criminal involvement?¹⁵ The recent case of Sean Penn, who succeeded in getting

12. Hood and Neeley (2000): "The typical holder of a concealed-weapon permit in Dallas is a white male who resides in an area with above-average income and education levels, and which is composed predominantly of non-Hispanic whites."

13. Carroll (2001). See footnote 6, *supra*.

14. Even if the right to carry concealed handguns is comforting to the relatively small portion of the population that will secure such permits, not everyone feels soothed by this prospect: "It scared the hell out of us," said John Chapman, director of human resources at Foodbrands America in Oklahoma City, which told its 5300 workers after the 1996 Oklahoma RTC law went into effect that anyone who brought weapons on company property could be fired. Similarly, Don Willett of Haynes & Boone in Austin, Texas advises his corporate clients to officially prohibit concealed weapons at their firms (Gerlin, (1996). One consequence of the discomfort caused by RTC laws is that sign makers in the new RTC states have done a booming business for all the companies who need signs saying that no guns are allowed on their property, which is yet another cost of these laws.

15. During the first 5.5 years of the Texas RTC law, the Violence Policy Center was able to identify that 41 permit holders were arrested for murder or attempted murder (the number would be too low if the researchers did not capture every permit holder in their count or if some permit holders committed murder and did not get arrested, and would be too high if some were falsely accused). The Violence Policy Center, License to Kill IV (June 2002), <http://www.vpc.org/studies/ltk4cont.htm>. The current murder

one of the relatively few gun permits in the non-RTC state of California, shows one way in which this can happen. After getting his permit, Penn bought a 9mm Glock handgun and a .38-caliber Smith & Wesson handgun, which he left in the trunk of his car when he went into a Berkeley restaurant only later to find the car had been stolen while he was dining (see Matier and Ross, 2003). Although the car was ultimately retrieved, the guns were not—criminals in the state of California now had two guns licensed to someone else to put to whatever mischief they wanted. This is not an unusual event. By some estimates, 1.5 million guns are stolen every year, which means that anything that increases gun ownership (and carrying a la Sean Penn) is likely to put more guns into the hands of criminals.¹⁶ Indeed, the most common event linking crime and guns in the United States is almost certainly not the defensive use of guns (nor even armed robbery, which reportedly occurred about 315,000 times in 2001),¹⁷ but the theft of lawfully possessed guns.¹⁸ Although gun advocates point out that permit holders only rarely commit murder, simply knowing that Sean Penn has not killed anyone tells us nothing about whether the guns he was carrying *only because he was able to get a concealed gun permit* will be used to kill, rape, rob, or assault others.

rate in the United States across all groups is roughly 5 per 100,000, so if one takes 150,000 as the average number of permits over the first five-year period, one would expect roughly 7.5 murders per year from gun permit holders (if they killed at the same rate as the average American today), which totals 41 murders over the full period. As noted, above, though, permit holders tend to be white and older, more affluent and less urban, which are all traits associated with lower rates of crime. This might be mildly suggestive that permit holders may be committing crimes at a higher rate than they would without RTC laws (assuming all 41 cases were actual and not just attempted murders). There were 169,013 permits in force in Texas as of October 1998 and 226,179 as of May 2003. <http://www.txdps.state.tx.us/administration/#crs> and http://www.txdps.state.tx.us/administration/crime_records/chl/demographics.htm.

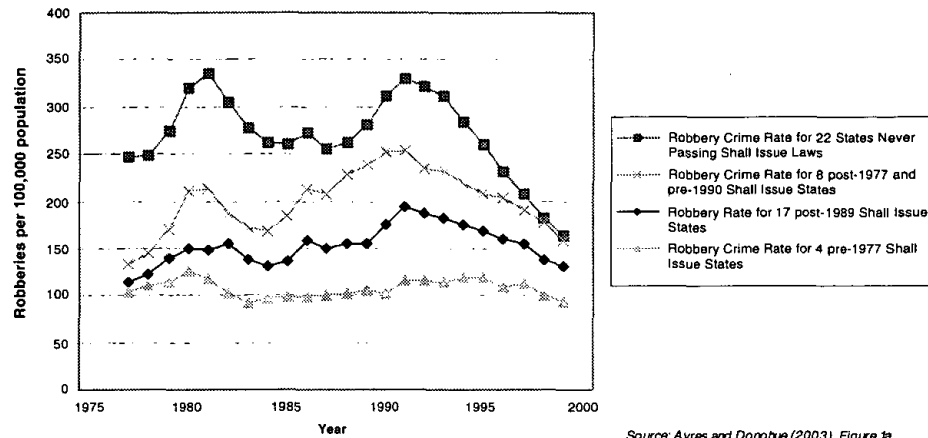
16. A more benign possible link between RTC laws and higher crime is that permit holders feel liberated by having their weapons and therefore spend more time out at night or in high crime areas so that although crime rises, there is a true benefit to the gun totes. I have seen no evidence to support the claim of increased victimization of permit holders, which would have to be quite high to influence aggregate crime rates given the relatively small percentage of permit holders.

17. As historian Randy Roth (2002: 700) has noted, some of the claims for the frequency of defensive use of guns are wildly excessive, “Kleck and . . . Gertz, for instance, argue on the basis of their widely cited survey that gun owners prevent numerous crimes each year in the United States by using firearms to defend themselves and their property. If their survey respondents are to be believed, American gun owners shot 100,000 criminals in 1994 in self-defense—a preposterous number.” The total number of justifiable homicides by citizens in which guns were used was only 176 in 2001 (FBI, 1997-2001, Table 2.17).

18. Philip Cook and Jens Ludwig have found that guns in homes may actually induce more burglaries due to the attractiveness of guns to criminals (for personal use or to sell for money). See Cook and Ludwig (2003).

Kovandzic and Marvell's third suggestion that RTC laws may decrease the costs of enforcement is almost certainly not the case. Such costs would presumably fall if RTC laws simply allowed anyone to carry a weapon, but RTC laws do not typically give this right. Instead, these laws create a new regulatory structure by requiring those who want to carry guns to secure permits and pay a fee for a certain period of time (and, in some cases, to undergo training in gun use and safety). Relatively few eligible individuals seem to want to comply with this regulation, so most gun toters are carrying illegally, as Kovandzic and Marvell note. This means that RTC laws will only complicate the job of the police because a prohibition on any carrying is easier to enforce than a regime in which some may lawfully carry but most who do carry do so unlawfully. Still, if the laws have increased crime costs on the order of only \$1-\$3 billion (plus any regulatory and licensing expenses in excess of permit costs) and make some people feel better, should we really oppose their adoption? To the extent that the laws actually increase the purchase and carrying of guns, they will also contribute to more accidental deaths and suicides, but in a culture already awash with guns, it is not clear how much worse RTC laws will make the situation. A major potential cost of RTC laws looms on the horizon, though, as the technology develops to allow the police to screen for gun possession from a distance. Although this technology holds out the prospect of making urban streets far safer, RTC laws may (and, if the NRA has its way, will) undermine the ability of the police to use the technology because it will potentially "catch" lawful permit holding gun toters (see Jacobs, 2002). Therefore, it is important that at least some states resist the avalanche of RTC adoptions so that if significant crime-reducing technology is developed, it can be fully implemented without the legal impediments that a RTC law would impose. In the meantime, I wonder what criminal is using Sean Penn's two guns?

FIGURE 1. ROBBERY RATES FOR STATES BY PASSAGE OF SHALL ISSUE LAW, WEIGHTED BY STATE POPULATION (VERNICK CODING)



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engaging in criminal activity, and the legalization of abortion sharply reduced the number of unwanted births. Professor Donohue received a JD from Harvard, and a Ph.D in economics from Yale.

