Do Laws Restricting Access to Firearms by Domestic Violence Offenders Prevent Intimate Partner Homicide?

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Eval Rev 2006 30: 313
DOI: 10.1177/0193841X06287307

DO LAWS RESTRICTING ACCESS TO FIREARMS BY DOMESTIC VIOLENCE OFFENDERS PREVENT INTIMATE PARTNER HOMICIDE?

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Domestic violence imposes a large cost on society. The authors exploit state variation in timing to examine the impact of three types of law on intimate partner homicides. These laws restrict access to firearms by individuals who are subject to a restraining order or have been convicted of a domestic violence misdemeanor or allow law enforcement officers to confiscate firearms at a domestic violence scene. The authors find that female intimate partner homicide rates decline 7% after a state passes a restraining order law. They find no effect from the domestic violence misdemeanor or confiscation laws.

Keywords: *firearms; domestic violence; intimate partner homicide*

On average, 3.5 people are killed by intimate partners every day in the United States, and many others are injured. Approximately 1 in 3 female homicide victims and 1 in 20 male homicide victims are killed by current or former spouses or boyfriends each year. About 60% of these homicides were committed using a firearm (Puzone et al. 2000). This intimate partner violence imposes a substantial economic cost: In 1995, the direct cost alone

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EVALUATION REVIEW, Vol. 30 No. 3, June 2006 313-346
DOI: 10.1177/0193841X06287307

of medical and mental health care from intimate partner violence was more than $4 billion (National Center for Injury Prevention and Control 2003).

There have been a number of laws enacted in recent years in an attempt to reduce the role of firearms in domestic violence. Our objective is to examine the impact of three types of state law on intimate partner homicides (IPHs): (a) laws preventing those individuals subject to a current restraining order from owning or purchasing a firearm, (b) laws that prevent individuals who have been convicted of domestic violence misdemeanors from owning or purchasing a firearm, and (c) laws that allow law enforcement officers to confiscate firearms at the scene of an alleged domestic violence incident. Understanding the impact of each of these laws is critical for developing policies to reduce IPHs.

BACKGROUND

Violence among intimate partners is a significant public health and social problem in the United States. Between 1981 and 1998, approximately 45,500 homicides occurred among intimate partners (Paulozzi et al. 2001). Fatalities only represent a small fraction of the problem. For example, in 1996, an estimated 25% of adult women and 8% of adult men had been raped or physically assaulted by an intimate partner in their lifetime (Tjaden and Thoennes 1998). Much nonfatal intimate partner violence occurs repetitively to victims, who are disproportionately female (Tjaden and Thoennes 2000). The violence has significant medical, psychological, and social consequences for victims and places a substantial economic burden on society (Crowell and Burgess 1996).

Few victims of nonfatal intimate partner violence report that an intimate partner actually used or threatened them with a gun: Less than 1% of women (0.7%) and only 0.1% of men reported being physically assaulted with a gun by their intimate partners in the National Violence Against Women Survey (NVAWS; Tjaden and Thoennes 2000). However, it is possible that the mere presence of a firearm or possibility of obtaining one serves as an implicit or explicit threat, making it more costly for the victim to leave the abusive relationship.

Furthermore, firearms play a much more prominent role in IPHs, the most lethal consequence of violence between spouses. Between 1982 and 2002, firearms were used in more than 60% of IPHs. Access to a firearm by the abusive partner significantly increases the risk of homicide for women in physically abusive relationships (Campbell et al. 2003). Not surprisingly, the type of weapon used in intimate partner violence is strongly associated with the lethality of such violence. Intimate partner assaults involving firearms

were significantly more likely to result in death than assaults involving knives or bodily force (Saltzman et al. 1992; Campbell et al. 2003).

Rates of IPH in the United States have generally been declining over the past few decades, falling nearly 50% between 1982 and 2002 (Browne and Williams 1993; Browne, Williams, and Dutton 1999; Dugan, Nagin, and Rosenfeld 1999; Greenfeld et al. 1998; Mercy and Saltzman 1989; Puzone et al. 2000). A number of explanations for this decline have been explored, including long-term declines in marriage rates (along with increasing age of first marriage); decreased economic dependence of women on men due to improved economic status of women; and the increased availability of services for victims of domestic violence (Browne and Williams 1989; Dugan, Nagin, and Rosenfeld 1999; Rosenfeld 1997). Efforts to test these explanations have found support for each of them, although support for declining marriage rates appears to be the strongest (Browne and Williams 1989; Dugan, Nagin, and Rosenfeld 1999). Moreover, these explanations appear to exert their strongest effect on the rate at which women kill their male partners.

There also has been legislation at both the state and federal level aimed at reducing domestic violence. Some of this legislation has focused on the role of firearms, making it more difficult for an abuser to gain or retain access to a gun. Very little work has been done to examine the impact of these laws on domestic violence outcomes. Dugan (2003) used individual-level survey data to evaluate several statutory measures relating to the issuance of protection orders and the consequences of violating them. She found that families living in states with more aggressive domestic violence laws have a lower probability of experiencing a domestic violence incident. We evaluated the impact of state restraining order and domestic violence misdemeanor laws on state IPH rates from 1982 to 1998 and found that states limiting access to guns by individuals under a restraining order laws had significantly lower rates of IPHs than states without these laws (Vigdor and Mercy 2003). We found no impact of laws restricting access to firearms by individuals with a domestic violence misdemeanor conviction.

In this article, we build upon our prior work (Vigdor and Mercy 2003) in three ways. First, we have incorporated data on state laws regarding the confiscation of firearms at a domestic violence scene. This allows us to examine another important set of laws that might impact IPHs. In addition, it is possible that omitting the confiscation laws from our previous analysis biased our findings by attributing the effect of these laws to the restraining order laws. Incorporating the confiscation laws, therefore, allows us to test the robustness of our previous results. Second, we extend our previous analysis by examining the relative effectiveness of laws restricting purchase versus possession. Breaking down specific elements of the statutes will better enable policy

makers to maximize the effectiveness of future laws. Finally, the analysis is strengthened by the addition of data through 2002. Since our prior work, two states have added domestic violence misdemeanor laws, and one has enacted a restraining order law. Furthermore, the additional data provide more information on the impact of these laws for the many states that enacted statutes in the years close to 1998.

STATE AND FEDERAL GUN LAWS

We focus on three particular types of laws: (a) those that prevent individuals subject to a current restraining order from owning or purchasing a firearm, (b) those that prevent individuals who have been convicted of domestic violence misdemeanors from owning or purchasing a firearm, and (c) those that permit law enforcement officials to seize firearms when at an alleged domestic violence scene.

Federal Laws

At the federal level, there are two components of the federal Gun Control Act that pertain to domestic abuse and firearm possession or purchase. The first piece, passed in September 1994 as part of the Violent Crime Control Act, makes it a federal offence to possess or receive a firearm while subject to a restraining order protecting an intimate partner[1] or the child of an intimate partner (18 U.S.C. § 922[g][8]). This statute was enacted along with the Violence Against Women Act (VAWA), which created federal crimes of domestic violence such as crossing state lines to violate a protective order. The law includes a due process provision that excludes temporary restraining orders; only those orders issued after a hearing at which the individual had an opportunity to participate invoke the federal firearm exclusion.[2]

The second component of the Gun Control Act is commonly known as the Lautenberg Amendment, passed in September 1996. This statute prohibits possession or receipt of a firearm by anyone who has ever been convicted of a qualifying misdemeanor crime of domestic violence (18 U.S.C. § 922[g][9]). To qualify, the statute of the misdemeanor for which a person is convicted must contain wording prohibiting the use or attempted use of physical force, or threatened use of a deadly weapon, against an intimate partner (18 U.S.C. § 921[a][33]). Therefore, not all domestic violence misdemeanors fall under the federal law.[3] In addition, certain due process requirements regarding counsel and jury trials must be met.[4]

There is no federal law pertaining to police confiscation of firearms or other weapons at the scene of an alleged domestic violence incident.

State Laws

A number of states have passed laws regarding confiscation of firearms allegedly used to perpetrate domestic violence as well as laws regarding firearms and domestic violence misdemeanors or restraining orders. There is tremendous heterogeneity in the detail and scope of all these laws, along dimensions such as the level of discretion by authorities, the precise action prohibited (firearm purchase or possession), the definition of intimate partner, the level of due process required, and the timing of the exclusions (e.g., a misdemeanor conviction in the past 5 years). Although it may seem redundant for a state to pass restraining order or domestic violence misdemeanor laws after the federal laws were enacted, there are in fact a number of important differences between the state and federal laws that often allow a state law to go well beyond the federal law. Consequently, it is not surprising that many of these laws were passed subsequent to the federal legislation.

Eighteen states have laws that allow law enforcement officers to confiscate guns at the scene of an alleged domestic violence incident (see Table 1). Eleven of those states require police to seize firearms at the scene that were used or threatened in the assault, whereas 7 states allow police to remove firearms at their discretion. Three of the 11 states that require removal of guns used in the domestic violence incident also permit seizure of other firearms that are present. Other details of individual state laws also vary, such as whether the seized guns must be in plain view (or discovered during a consensual search) or whether police can search for them, whether removal of guns requires the arrest of the abuser, whether the removed firearms must pose a danger to someone, and whether ammunition must also be confiscated. We do not know the frequency of discretionary firearm seizures, nor do we know how often the various state requirements for seizure are met.

Twelve states have laws that prevent individuals with a domestic violence misdemeanor conviction from either purchasing or possessing a firearm. In addition, 1 state (Colorado) had a law that was repealed in 1998 along with the state's instant background check legislation (see Table 2). The vast majority of these states passed their laws prior to the federal legislation, although 2 enacted their laws in early 1996. In every state but Colorado and Iowa, all guns are covered under the law; Iowa restricts handgun purchase and carrying or transport of any firearm. Three states restrict purchasing or carrying but not possession.

Table 3 lists the states that have laws restricting access to guns by individuals under a court order. There were 24 states with such laws as of 2002. By 2002, only 3 states exempted possession of firearms while disallowing

TABLE 1: States Allowing Confiscation of Firearms at a Domestic Violence Scene

State	*Year Passed*	*May/Shall*
Alaska	1996	May
Arizona	1996	May
California	1984	Shall
Connecticut	1999	May
Hawaii	1996	May
Illinois	1993	Shall
Indiana	2002	May
Maryland	1996	May
Montana	1995	Shall
Nebraska	2004	May/Shall
New Hampshire	2000	Shall
New Jersey	1991	May
Ohio	1994	Shall
Oklahoma	1993	Shall
Pennsylvania	1986	Shall
Tennessee	1995	May/Shall
Utah	1995	Shall
West Virginia	1998	May/Shall

TABLE 2: States With Restrictions on Access to Firearms by Domestic Violence Misdemeanants

State	*Year Passed*	*Type of Firearm*	*Action Prohibited*
California	1994	All	Possession/sale to
Colorado[a]	1994	Handguns	Purchase
Delaware	1999	All	Possession/purchase
Florida	1995	All	Purchase
Hawaii	1988	All	Possession/purchase
Illinois	1996	All	Possession/purchase
Iowa	1987	Handguns	Purchase
		All	Carrying
Minnesota	1992	Handguns	Possession
	1994	All	
New York	1993	All	Possession
Pennsylvania	1995	All	Possession
Texas	2001	All	Possession
Washington	1993	All	Possession
West Virginia	1996	All	Carrying
	2000		Possession

a. Repealed in 1998.

TABLE 3: States With Restrictions on Access to Firearms by Persons Under Restraining Orders

State	*Year Passed*	*Type of Firearm*	*Action Prohibited*	*Includes Temporary Restraining Orders?*
Alaska	1996	All	Possession	No
Arizona	1996	All	Possession/purchase	Yes
California	1991	All	Purchase	Yes
	1995		Possession	Yes
Colorado[a]	1994	Handguns	Purchase	Yes
		All	Possession	Yes
Connecticut	1994	Handguns	Possession	No
Delaware	1994	All	Possession/purchase	No
Florida	1995	All	Purchase	No
	1998	All	Possession	No
Hawaii	1993	All	Possession/purchase	Yes
Illinois	1996	All	Possession	No
Indiana	1999	All	Possession	No
Maine	1997	All	Possession	No
Maryland	1996	Handguns	Possession/transfer to	No
Massachusetts	1994	All	Possession/purchase	Yes
Michigan	1996	Handguns	Possession/purchase	Yes
New Hampshire	1990	All	Possession	Yes
	2000	All	Purchase	Yes
New Jersey	1991	All	Possession/purchase	Yes
New York	1996	All	Possession	Yes
North Carolina	1995	All	Purchase	No
North Dakota	1997	All	Possession	Yes
Pennsylvania	1995	All	Possession	No
Texas	1996	Handguns	Transfer to	Yes
Virginia	1994	All	Purchase/transport	Yes
West Virginia	1996	All	Carrying	Yes
	2000		Possession	No
Wisconsin	1996	All	Possession	No

a. Purchase law repealed in 1998.

purchase or receipt, although several states started with a law banning purchase only and incorporated possession at a later date. Just over half of the states include temporary restraining orders along with those issued after a hearing. Unlike the domestic violence misdemeanor laws, most of the restraining order laws were passed after the federal law. Eight states, just over a third, passed their first law prior to the VAWA. However, only 3 of these states passed a law before 1994.

State restraining order and domestic violence misdemeanor laws may differ substantially from federal laws in several ways. One is the definition

of who qualifies as a domestic abuser or intimate partner. The federal law is fairly broadly defined, but it does exclude non-intimate-partner family members as well as former or current significant others unless they have cohabitated or had a child with the victim. State definitions tend to be broader, often including current and/or past boyfriends and girlfriends and other nonintimate relatives.

Another potential difference between the state and federal laws is that states can be more liberal in the definition of misdemeanors that disqualify an individual. The disqualifying crimes vary widely from state to state. For example, purchase of a firearm is prohibited in Iowa by anyone ever convicted of domestic abuse assault or stalking; in Florida by anyone arrested for an act of domestic violence; and in Illinois by anyone who has committed domestic battery with a firearm, violated a protective order, or committed a stalking crime. A related point is that many states have codified specific crimes of domestic violence, whereas others rely on general criminal offenses committed against family members or intimate partners. In the latter case, it may be more difficult to identify individuals who are precluded from gun ownership or purchase as doing so relies heavily on adequate record keeping and classification.

A final important component that distinguishes many state laws from the federal equivalent is the inclusion of temporary restraining orders. These are short-term restraining orders that grant an injunction against the respondent until a hearing is held. Of the 24 states that have laws restricting access to firearms by those under a court order, 13 include temporary orders. However, in a majority of states, the firearm restrictions are not automatic upon issuance of a court order (either temporary and permanent) but are left to the discretion of the court. We do not know the national frequency with which a judge elects to prohibit purchase or possession of a firearm when a restraining order is issued.[5]

Virtually nothing is known about the degree of enforcement for any of these laws, particularly for laws prohibiting possession of a firearm. Only two states—New Jersey and New Hampshire—permit the court to order a search and seizure order for weapons when issuing a restraining order (Mecka 1998). The extent to which batterers voluntarily surrender their firearms once a restraining order has been issued against them is unknown. Anecdotal evidence suggests that the possession laws are not widely enforced and that the system relies heavily on complaints by victims or subsequent criminal acts to identify noncompliers (for example, see Kovner 1999; Malone 1998; Stingl 1996; *United States v. Emerson* 1999).

CONCEPTUAL FRAMEWORK

The primary purpose of all these state laws is to protect the partners and children of these individuals from threats and severe or lethal injury from a firearm. Confiscating a firearm or making it illegal for batterers to purchase or possess a firearm effectively increases the cost of perpetrating domestic violence with a firearm. Furthermore, if a potential batterer values having a gun for any purpose, then these laws increase the cost of committing any type of domestic violence, by increasing the probability of losing one's firearms through one of the laws. Because these laws effectively increase the price of acquiring or possessing a firearm, we would expect implementation of a law to lead to a reduction in gun-related IPHs and other forms of domestic violence on the margin. In addition, increasing the cost of obtaining or having a gun reduces the probability that a gun will be present or used in a domestic violence incident. Because firearms have a higher level of lethality than other weapons, this reduces the likelihood that an incident of intimate partner violence will end in a homicide.

However, we might also expect to find an effect on nonfirearm domestic violence. It is plausible that the mere presence of a gun in the household (or threat of acquiring one) increases the cost to the victim of leaving her abuser. An abuser's ability to credibly threaten the victim declines with the loss of a firearm, which increases the bargaining power of the victim. This makes it easier to leave the relationship without fear of being attacked or killed with a gun, which may remove the victim from a situation in which a potential homicide may occur. Furthermore, some IPHs may be the result of escalating abuse, occurring when the battering exceeds some threshold. If batterers respond to the higher price of violence by reducing the amount they "consume" to decrease the likelihood that the victim will obtain a restraining order or press criminal charges, on the margin we would expect some homicides to be prevented. Those homicides would not necessarily have to be committed with a firearm.

On the other hand, we might also expect nonfatal domestic violence to increase if there is substitution into less lethal weapons by abusers. An alternative response to the higher price of using a firearm could be that batterers substitute other weapons when they intend to kill their partners, in which case we might see an increase in non-firearm-related IPHs. Which effect will dominate is an empirical question.

Although we would theoretically expect to see a reduction in IPHs if these laws work as intended, it is important to point out that the true impact

of these laws depends on the occurrence of a series of actions involving law enforcement, the courts, and federal firearm licensees (FFLs).[6] The impact of these laws is contingent upon at least four factors. The first is whether a batterer or stalker is involved in an incident in which the police are called, gets arrested and convicted, or becomes subject to a restraining order. Only a fraction of persons who assault or harass their intimate partners are arrested and ultimately convicted. Previous research suggests that the police are informed in less than half of all domestic violence incidents (Dugan 2003). Estimates from the NVAWS suggest that only 3% to 6% of self-reported rapes, physical assaults, and cases of stalking by intimate partners result in a conviction of the perpetrator (Tjaden and Thoennes 2000). Temporary restraining orders are much more common than misdemeanor convictions: Female victims of rape and physical assault obtain temporary restraining orders in about one of every six incidents, whereas female victims of stalking obtain temporary restraining orders in about one of every three incidents. However, we do not know how many temporary restraining orders eventually become permanent restraining orders.

A second factor that may affect the impact of these laws is whether information is recorded in a state database that enables the appropriate authorities to conduct a background check for the existence of a domestic violence misdemeanor conviction or restraining order in the criminal history of an applicant for purchase of a firearm. In states that do not maintain computer databases that would permit screening for domestic violence misdemeanors or restraining orders among firearm purchasers, applicants for firearm purchases with these relevant convictions or restraining orders could easily violate federal or state laws regarding firearm purchases. This issue is addressed in more detail later.

A third contingency involves the purchase, surrender, or confiscation of a firearm. As discussed above, we do not know how rigorously any of these laws are enforced. We also do not know what proportion of batterers own firearms, nor the frequency with which those who are prohibited from possessing a firearm surrender their firearms to authorities. It also is possible that some prohibited persons or those who have had their firearms confiscated may attempt to purchase a firearm though a legal or illegal avenue other than an FFL (e.g., gun shows, acquaintances, straw purchases, etc.). In most states, firearms can be sold or traded anonymously at gun shows, flea markets, or garage sales. Consequently, even if a state maintains an adequate database, batterers who are not legally permitted to obtain firearms could potentially purchase firearms through these avenues. The frequency with which persons with misdemeanor convictions or restraining orders attempt to purchase firearms is unknown.

Finally, the association between access to a firearm and threats or injuries to intimate partners, children, or others may also impinge on the impact of these laws. Unfortunately, no data exist on how many persons whose firearms are confiscated, who are convicted of domestic violence misdemeanors, or who under restraining orders subsequently threaten or injure their partners or others with a firearm. We know that violence within intimate relationships often is repetitive and that these repeated incidents may escalate in severity (Tjaden and Thoennes 2000). We also know that access to a firearm may increase the likelihood that an incident of intimate partner violence could result in death (Saltzman et al. 1992; Campbell et al. 2003). The question remains, however, as to whether laws to restrict access to firearms by batterers are effective in spite of the many factors that limit their potential impact.

ESTIMATION AND DATA

Guns are not commonly used in domestic abuse incidents, and therefore, we might not expect to find a large impact on domestic violence overall. However, firearms do contribute heavily to IPHs, and these laws are designed to reduce the ability of abusers to kill their partners. Therefore, we can evaluate the effect of these laws by looking at changes in IPHs in states that have passed the laws compared with states that have not.[7]

Ideally, we would like to examine the impact of these laws on both fatal and nonfatal incidents of domestic violence. However, to evaluate the impact of state laws that were adopted at different times, we need annual, state-level data for our outcome measures. Unfortunately, statistics are not kept regularly on domestic violence outcomes, with the exception of homicide data. Because we lack available, reliable data on nonfatal outcomes, we focus on IPHs.

ESTIMATION

The states that have laws limiting access to guns by abusers passed their legislation at different times. We exploit this time variation by effectively comparing IPH rates before and after passage of the law in states that enacted these laws with those in states that did not pass such a law. Although we cannot be certain that we are isolating the impact of the laws, the time variation in the effective dates of the laws reduces the likelihood that we are capturing the effect of an omitted shock affecting all IPH rates.

IPHs are counts of an occurrence, and there are a number of states that record no IPHs in a particular year; therefore, a Poisson or negative binomial model is most appropriate for our analysis. Deviance goodness-of-fit tests rejected the Poisson model due to overdispersion, so we use negative binomial regression for our estimation.[8] With the negative binomial model, the probability of a state having IPHs in a given year equal to h_{it} is given by

$$\Pr(H_{it} = h_{it}) = \frac{\Gamma(y_{it} + \alpha^{-1})}{\Gamma(y_{it} + 1)\Gamma(\alpha^{-1})} \left[\frac{1}{1 + \alpha\mu_{it}}\right]^{\alpha^{-1}} \left[\frac{\mu_{it}}{\alpha^{-1} + \mu_{it}}\right]^{y_{it}},$$

where Γ is the Gamma function, $E(H_{it}) = \mu_{it}$, and $\mathrm{Var}(H_{it}) = \mu_{it} + \alpha\mu_{it}^2$.

The mean number of IPHs, μ_{it}, is log-linearly related to the explanatory variables:

$$\ln(\mu_{it}) = \ln(POP) + \beta_1 RO_{it} + \beta_2 DVM_{it} + \beta_3 C_{it} + \beta_4 M_{it} + \beta_5 F_{it} + \beta_6 G_{it} + \beta_7 D_{it} + s_i + \tau_t + r,$$

where *POP* is the gender-specific population older than age 10 in state *i* at year *t*. The coefficient on *POP* is constrained to 1, effectively modeling the incidence of IPHs as a function of the independent variables. RO_{it}, DVM_{it}, and C_{it} are dummy variables for whether a state had in effect that year a restraining order law, a domestic violence misdemeanor law, or a confiscation at the scene law, respectively. M_{it} is stranger homicides per 100,000, F_{it} is the household prevalence of firearms, G_{it} is a vector of other gun laws in effect that year, and D_{it} is a vector of demographic and other variables.

State fixed effects (s_i) are included to account for any unmeasured time-invariant state characteristics. This is very important because states that pass these laws are different from those that do not, and states that pass one type of law are different from those that pass another (Vigdor and Mercy 2003). Year dummies (τ_t) are included to capture any nationwide trends, and regional time trends (r) are included to capture any trends that vary within the country as a whole. Note that the year dummies also pick up any constant effect of the two federal laws that took effect in all states simultaneously. Because we have included state fixed effects, we are able to identify the effects using within-state changes in the state laws over time. We also corrected the standard errors for clustering at the state level (Bertrand, Duflo, and Mullainathan 2004).[9]

Although the year dummies capture any constant impact from the federal laws, they do not measure any differential impact of the federal laws

by state. If states began enforcing the federal laws at different rates and with varying degrees of effectiveness, the coefficients on the state law variables would be biased. The direction of the bias is not clear a priori. States with laws already in place should be screening out the prohibited parties and experience little or no impact from the federal laws, which would bias the coefficients toward showing a smaller effect of the state laws. On the other hand, it is also possible that states with their own laws in place already may have the infrastructure to enforce the federal law and are, therefore, more effective in doing so, biasing the coefficients toward showing a larger impact of the state laws. However, there are no state restraining order laws that are less restrictive than the federal law, so it is likely that our estimates will be conservative for these laws. There is more heterogeneity in the misdemeanor laws, so it is less clear what the net impact on our results will be.

Our dependent variable is the number of IPHs. We look at total IPHs, examining two categories: all IPHs and intimate partner firearm homicides. Because IPH victims were female in about 66% of cases, we also look at female IPHs. Our unit of observation is a state-year. We have complete data from 1982 to 2002 for 46 states. Four states and the District of Columbia are excluded because they did not report multiple years of homicide data.[10] Five states were missing only 1 year of homicide data. For these states, the homicide counts were set equal to one, and a dummy variable was included in the regression that takes on a value of one for each of the five missing state-years. The coefficient on this dummy variable is not meaningful, but this allows us to use information from these states for the nonmissing years.

We also control for other firearm laws enacted by states over this time period, including required background checks for private sales, required background checks for dealer sales, mandatory waiting periods, one gun a month laws, Saturday Night Special bans, and requiring a permit to purchase a gun (Vernick, Hepburn, and Schofield 2001). We determined that 14 states also have laws that restrict access to firearms by people convicted of certain violent misdemeanors apart from domestic violence-related misdemeanors. It is very important to control for the passage of these laws as batterers may be prohibited from purchasing or owning guns even in states that do not explicitly have domestic violence provisions. Even in states that do have domestic-violence-related laws, these more general laws may cover violent misdemeanors that are not enumerated under the relevant domestic violence statutes. We include an indicator variable for each of these laws equal to one if the law was in effect for a particular state in a given year.

Because perpetrators of homicide are most likely to be young, male, non-White, and living in poverty (Fox and Zawitz 2000; Sampson and Lauritsen 1994), we include the following demographic variables as controls

in our regressions: the percentage of the population aged 20 to 34 years, percentage Black, number of males per 1,000 population, percentage of the population living in an urban area, the poverty rate, and median income. The previous literature suggests that declining marriage rates and ease of divorce have contributed to the decline in IPHs (Browne and Williams 1989; Dugan, Nagin, and Rosenfeld 1999; Stevenson and Wolfers 2000); therefore, we also control for marriage rates and the presence of unilateral divorce laws.[11] Because alcohol consumption has been identified as a risk factor for intimate partner abuse (Greenfeld 1998; Leonard 1993), we control for per capita ethanol consumption.

We include the stranger homicide rate to control for any other factors that might affect overall levels of violence in a state. Gun availability in general may increase rates of gun violence. To control for this, we include a proxy for household gun prevalence developed and validated by Azrael, Cook, and Miller (2004), namely, the proportion of all suicides that were committed with a firearm.[12] Finally, we would like to control for various attributes of the performance of the criminal justice system in each state. Unfortunately, the only data we have at the state-year level to do this are arrest rates. We include a set of indicator variables for the quartile of adult arrest rates as well as a category for missing arrest rates (approximately 2% of the observations). Summary statistics for IPH rates as well as the independent variables are shown in Table 4. Most continuous variables were entered in natural log form because it improved the fit of the model.

DATA SOURCES

We obtained counts of IPHs by state from the Federal Bureau of Investigation (FBI) Supplementary Homicide Report (SHR) files for the years 1982 through 2002. Our initial data comprised all homicides that occurred in the United States for which we have data, including both U.S. and non-U.S. residents. The SHR files contain information on sex, age, race of victims and offenders, the victim-to-offender relationship, the circumstances under which the homicide occurred, the type of weapon used, and the geographic location of the homicide. The relationship categories that we used to classify intimate partner relationships were spouse, ex-spouse, common-law spouse, boyfriend, girlfriend, and homosexual relationships. SHRs have no separate category for ex-boyfriend or ex-girlfriend, although such relationships can be regarded as intimate (Saltzman et al. 1999; Paulozzi et al. 2001). We confined our counts of IPHs to those incidents where the victim was 10 years old or older and the offender was an intimate partner.[13] Because of data limitations, we dropped cases with multiple victims older than

TABLE 4: Summary Statistics

	2002 (N = *46*)	*All Years (1982-2002)* (N = *966*)
Intimate partner homicides (IPHs)		
Female IPHs per 100,000 women	0.87 (0.31)	1.08 (0.61)
Female firearm IPHs per 100,000 women	0.54 (0.39)	0.69 (0.47)
IPHs per 100,000 population	0.58 (0.31)	0.84 (0.52)
Firearm IPHs per 100,000 population	0.35 (0.23)	0.52 (0.39)
Percentage of states with laws:		
Prohibiting access to firearms if under a restraining order	45.7 (50.4)	17.3 (37.8)
Prohibiting access to firearms if convicted of domestic violence misdemeanor	23.9 (43.1)	10.2 (30.3)
Allowing confiscation of firearms at a domestic violence scene	32.6 (47.4)	12.5 (33.1)
Purchasing restrictions for firearms	67.4 (47.4)	60.4 (48.9)
Demographics and other characteristics		
Stranger homicides per 100,000	0.52 (0.41)	0.74 (0.58)
Population older than age 10	4,978,887 (5,432,084)	4,436,560 (4,754,499)
Percentage aged 20-34	20.6 (1.3)	23.5 (2.7)
Percentage Black	10.6 (9.8)	10.2 (9.5)
Percentage male	49.3 (0.8)	49.0 (0.9)
Percentage urban population	69.6 (20.3)	68.6 (20.8)
Percentage under poverty line	11.8 (3.3)	13.3 (4.2)
Median income ($)	61,953 (8,633)	44,573 (12,646)
Marriages per 1,000	9.42 (9.12)	11.27 (13.07)
Percentage states with unilateral divorce law	89.1 (31.5)	88.6 (31.8)
Per capita ethanol consumption (gallons)	2.28 (0.46)	2.40 (0.60)
Percentage households with firearms (firearm suicides/total suicides)	55.2 (13.4)	59.4 (13.5)
Arrests of persons older than 18 per 1,000 (n = 948 for 1982-2002)	42.7 (12.1)	44.8 (13.9)

NOTE: Standard deviations in parentheses.

age 10 and restricted counts of firearm-related homicides in this analysis to one-victim, one-perpetrator incidents (see Vigdor and Mercy [2003] for more detail). These data limitations are unlikely to affect the results appreciably given that one-victim, one-perpetrator incidents comprise 97% of all IPHs. The dependent variables constructed for use in this analysis were counts of the number of total and firearm-related homicides for each state for the years 1982 to 2002.

The explanatory variables of interest are whether a state had a law restricting firearm access by persons convicted of a domestic violence misdemeanor, whether the state had a law restricting access to guns by individuals under a restraining order, and whether the state had a law allowing police to confiscate firearms at the scene of an alleged domestic violence incident. To determine whether states had a particular law, we first checked several government publications of firearm laws (Bureau of Alcohol, Tobacco and Firearms 2001; Regional Justice Information Center 1996, 1997, 1998, 2000, 2001). We then used the legal databases Lexis-Nexis and Westlaw to locate additional laws. Many of the restraining order laws are codified under family law, and some are not referenced in the section of the state code that deals with firearms. Lexis-Nexis, Westlaw, and historical published versions of state code were used to ascertain the effective dates of the legislation.

There is tremendous heterogeneity in the scope and scale of the state laws. There also are unmeasured differences in the state laws, such as the degree to which they are enforced. Our sample is not large enough to permit us to analyze the particular details of most of these laws. For our primary analysis, we generate a set variables defined as the fraction of the year that a state had each type of law in effect. After excluding states for the aforementioned reasons and the fact that our data go through 2002 only, our analysis included 12 states with domestic violence misdemeanor laws (excluding Florida), 21 states with restraining order laws (excluding Florida and Maine), and 15 states with confiscation laws (excluding Montana). States that prohibit carrying only were counted as having possession laws; coding them as having no law did not affect the results.

Annual population data were obtained from U.S. Census Bureau population estimates. Annual poverty rate and median income data were obtained from the Current Population Survey. Marriage data were obtained from the U.S. Census Bureau's *Statistical Abstract of the United States*; information on unilateral divorce laws came from Friedberg (1998). The National Institute on Alcohol Abuse and Alcoholism provided the per capita ethanol consumption data. Suicide data were obtained from the Centers for Disease Control. Arrest rates were provided by the Federal Bureau of Investigation. Summary statistics for these variables are shown in Table 4.

RESULTS

IPHs

Figure 1 shows IPH rates from 1982 to 2002. All types of IPHs declined over this period. Prior to 1990, there were greater fluctuations in the rates

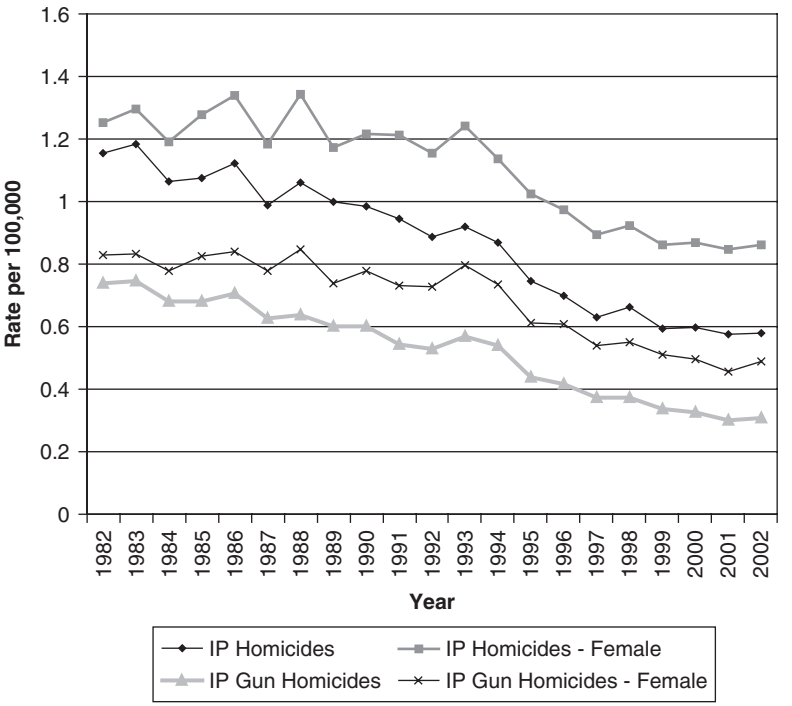

Figure 1: Intimate Partner (IP) Homicides, United States, 1982-2002

from year to year, with the highest rates occurring in the mid 1980s. Overall, however, all IPH rates exhibit a general downward trend between 1982 and 2002. This is in contrast to rates of most other violent crimes, which tended to rise in the mid- to late 1980s and then decrease after 1992 through the rest of the 1990s. Throughout this period, the IPH rates for women were higher than the overall IPH rate. The total IPH rate in 2002 was 0.58 homicides per 100,000 population, whereas for women the rate was 0.87 per 100,000 women. For firearm IPHs, the overall rate was 0.35 per 100,000 people and 0.54 per 100,000 women (see Table 4).

EFFECT OF STATE LAWS ON IPH RATES

The results from the regressions of various measures of IPH rates on whether a state law was in effect in a particular year are shown in Table 5.

TABLE 5: Effect of State Domestic Violence Gun Laws on Intimate Partner Homicides (IPHs)

	Incidence Rate Ratios (IRRs) (95% Confidence Intervals in Parentheses) (N = 966)			
	All IPHs	*All Firearm IPHs*	*Female IPHs*	*Female Firearm IPHs*
I. State laws				
Restraining order law	0.92**	0.91**	0.92**	0.90***
	(0.86, 0.99)	(0.84, 0.99)	(0.86, 0.98)	(0.83, 0.97)
Domestic violence misdemeanor law	1.00	0.92	0.98	0.93
	(0.92, 1.09)	(0.84, 1.02)	(0.89, 1.07)	(0.82, 1.04)
Confiscation law	0.95	0.94	0.98	0.96
	(0.87, 1.04)	(0.83, 1.07)	(0.89, 1.09)	(0.82, 1.11)
II. States categorized by prohibited action				
Restraining order—Purchase or purchase and possession	0.90**	0.88***	0.90***	0.87***
	(0.84, 0.98)	(0.82, 0.95)	(0.85, 0.95)	(0.81, 0.94)
Restraining order—Possession only	0.98	1.01	0.98	0.97
	(0.90, 1.07)	(0.90, 1.14)	(0.88, 1.09)	(0.85, 1.11)
Domestic violence misdemeanor—Purchase or purchase and possession	0.94	0.92	0.92	0.89
	(0.85, 1.04)	(0.80, 1.06)	(0.82, 1.03)	(0.78, 1.03)
Domestic violence misdemeanor—Possession only	1.04	0.93	1.02	0.95
	(0.97, 1.12)	(0.84, 1.02)	(0.93, 1.11)	(0.85, 1.07)
Confiscation law	0.97	0.96	1.00	0.97
	(0.89, 1.05)	(0.85, 1.08)	(0.91, 1.10)	(0.84, 1.12)

III. States categorized by ability to check backgrounds				
Restraining order law and high ability to check in database	0.90**	0.88***	0.91**	0.87***
	(0.82, 0.99)	(0.80, 0.97)	(0.83, 0.98)	(0.79, 0.95)
Restraining order law and low ability to check in database	0.97	0.97	0.94	0.95
	(0.90, 1.03)	(0.87, 1.08)	(0.88, 1.02)	(0.85, 1.05)
Domestic violence misdemeanor law and high ability to check in database	1.01	0.95	0.97	0.94
	(0.91, 1.11)	(0.87, 1.07)	(0.85, 1.05)	(0.83, 1.08)
Domestic violence misdemeanor law and low ability to check in database	1.01	0.91	1.00	0.92
	(0.93, 1.10)	(0.82, 1.03)	(0.81, 1.03)	(0.82, 1.03)
Confiscation law	0.94	0.93	0.98	0.94
	(0.85, 1.04)	(0.81, 1.07)	(0.81, 1.07)	(0.81, 1.10)

NOTE: State-year panel negative binomial regressions from 1982 to 2002 with state and year fixed effects and region time trends. The IRR gives the relative rate for a one-unit increase in the explanatory variable, that is, a one-unit increase in the explanatory variable increases the IPH rate by (100 × [IRR – 1])%. Regressions also control for stranger homicide rate, demographic characteristics, other gun laws, unilateral divorce law, log per capita ethanol consumption, arrest rates, gun prevalence, and whether homicide data or arrest data were missing that year.
**$p < .05$. ***$p < .01$.

The first and second columns are all IPHs and the subset of those committed with a firearm, respectively. The first part of Table 5 shows the results of having either a domestic violence misdemeanor, restraining order, or confiscation law in effect. States with restraining order laws have significantly lower rates of total IPHs and IPHs committed with a firearm. The magnitude of the impact of the restraining order laws is fairly large: At the mean, this implies an 8% reduction in the IPH rate and a 9% reduction in the rate of IPHs committed with a firearm. However, in absolute terms the numbers are small: In a year in which the law is in effect, a state has an average of 2.9 fewer IPHs and 2.0 fewer IPHs committed with a firearm. These results imply that laws restricting access to firearms by abusers under a restraining order also lead to a reduction in nonfirearm homicides.

The third and fourth columns show the analogous results for female IPHs. The results are very similar to those for all IPHs. States with restraining order laws have an 8% reduction in the female IPH rate and a 10% reduction in the rate of female IPHs committed with a firearm. This translates into an average of 1.6 fewer female intimate partner firearm homicides and 2.0 fewer female IPHs for each year that a state has the law in effect. These results show that although these laws do primarily affect the number of female IPHs, there is a reduction in IPH rates for both genders when a restraining order law is passed. This may reflect a reduction in female batterers obtaining guns, or it may indicate a decline in self-defense homicides as a result of the lower cost of leaving a relationship or reduced level of violence.

For all four dependent variables, we find no difference in IPH rates when a state-level domestic violence misdemeanor or confiscation law is in effect. The incidence rate ratios are less than one for the confiscation law (in all models) and the domestic violence misdemeanor law (in all but the total IPH specification), but none of the incident rate ratios (IRRs) are significant.

PURCHASE AND POSSESSION

We might expect that it would be more difficult for states to enforce laws prohibiting possession of a firearm than laws prohibiting purchase. Because there is no registry of firearm owners, someone who already owns a firearm and becomes prohibited from doing so must either voluntarily relinquish his guns or the police must search for and seize them. The latter requires somebody notifying the police about the gun and may also require a search warrant. It would not be difficult for someone to keep a gun without the knowledge of the police. In contrast, it is relatively easy to identify a prohibited person who attempts to buy a firearm from an FFL and stop the sale from taking place.

The second part of Table 5 divides the laws into those that prohibit possession only and those that prohibit either purchase of a firearm or both purchase and possession (see Tables 2 and 3). This distinction is not relevant for the confiscation laws. For the restraining order laws, it appears that only the states that include a purchase restriction have a significant reduction in IPHs. The magnitude of the IRRs for the laws restricting purchase or both purchase and possession is similar to the overall restraining order results in Table 5, although the effect of the laws is a bit stronger. States with a restraining order law incorporating a purchase restriction have overall IPH rates that are 10% lower and firearm IPH rates that are 12% lower. These states also see a decline in female IPH rates and female firearm IPH rates of 10% and 13%, respectively. This implies that these states have an average of 3.6 fewer IPHs in a year, of which 2.8 are firearm IPHs; and 2.5 fewer female IPHs, of which 2.0 are firearm IPHs. States that have possession-only restraining order laws do not experience a reduction in IPHs under any specification.

Once again, we find no significant effect of the domestic violence misdemeanor or confiscation laws in any of the specifications.

ABILITY TO CHECK BACKGROUNDS

We would expect states that have a high ability to identify individuals who are excluded from purchasing or possessing a firearm as a result of domestic violence to experience a greater reduction in domestic violence outcomes. To test this, we categorize states as having either high or low ability to check for the appropriate background information for the restraining order or domestic violence misdemeanor laws.

Using information collected by the Bureau of Justice Statistics, we divided states into two groups: those with a high ability to ascertain the relevant information and those with a low ability to do so. States are considered to have low ability to check backgrounds in a given year if they (a) did not have the relevant domestic violence data available to check, (b) had less than 50% of the data in the system, or (c) only kept the data locally and did not have a computerized system. For a few states prior to 1995 we were not able to determine whether states had high or low ability to check, so we conservatively assumed that the ability to check existed provided that the state conducted background checks.

Of the 12 states with domestic violence misdemeanor laws included in our analysis, 10 were classified as having high ability to check in 2002. Of the 21 states in our analysis with restraining order laws, 17 had a high ability to check backgrounds by 2002. In both cases, a number of states started as low ability to check states and later developed a high ability to check.

These results are shown in the third part of Table 5. Not surprisingly, there appears to be a difference in the outcomes between states that are able and those that are unable to screen for DV misdemeanors or restraining orders. The IRRs are higher and not significant when a state is unable to screen for restraining orders for all outcomes. Removing the effect of the low-ability states produces reductions in the IRRs for the high-ability variable that are slightly larger in magnitude than those in the first part of Table 5, with reductions of 9% to 13% of IPHs depending on the outcome measure. The IRRs are significant for all specifications for states that are able to check backgrounds. As in the overall results, the absolute decline in homicides is not large: On average, these states would experience 3.8 fewer IPHs per year, of which 2.8 were committed with a firearm; and 2.3 fewer female IPHs a year, of which 2.1 were committed with a firearm.

The incidence rate ratio for the domestic violence misdemeanor laws is not significant for any of the outcomes. Even in states that have a high ability to check backgrounds, we are unable to detect an effect of these laws. The confiscation laws also do not have a significant effect on any of the outcomes.

CHARACTERISTICS OF THE CONFISCATION LAWS

In results not shown here, we also tried refining the specification of the confiscation law variables. Specifically, we looked separately at (a) states with shall-confiscate versus may-confiscate laws; (b) states where only firearms used or threatened in the domestic violence incident are eligible for confiscation, compared with states where any firearms can be seized; and (c) states where only firearms in plain view or discovered via consensual search can be taken, compared with states where the police may search for firearms. None of these specifications yielded substantively different results from those presented here.

OTHER CRIMES

To interpret the results of our state law regressions as the actual impact of the particular law of interest on IPH rates, we must assume that there are no omitted factors that are correlated with the passage of these laws. However, given that states passed these laws at different times and because we control for year effects, any omitted factor would have to affect states differentially across time. Furthermore, the results in Table 5 suggest that this is unlikely to be the case, as such a factor would have to produce a pattern of impact over time that is consistent with the timing of the restraining order laws and was

confined to states with the ability to check backgrounds and the inclusion of a purchase restriction in the restraining order laws. Of course, it is not possible to rule out the existence of these factors with certainty.

One statistical approach we could use to infer causality from our data would be an instrumental variables (IV) analysis. Unfortunately, this approach is extremely difficult to do when examining these types of legislative changes. IV analysis requires finding a suitable instrument, that is, a variable that is highly correlated with the explanatory variable of interest (in this case, the passage of the relevant law in a particular state), but only related to the outcome (IPH rate for a state-year) through its correlation with the independent variable. It is challenging to find instruments for this kind of legislation, as they would need to replicate the variation in timing across states while remaining independent of IPHs.

One robustness check we can do to test whether an omitted factor is contributing to our results is to examine the relationship between the presence of these laws and rates of crime other than IPHs. Table 6 shows the impact of state-law-only indicator variables on stranger homicide rates, rapes, robberies, assaults, burglary, and motor vehicle theft. If the observed effect of the restraining order laws on IPHs was the result of an omitted measure of broad trends in crime, violence, or enforcement, we also would expect to find some impact on crime rates other than IPHs. In fact, the restraining order law variable has no significant impact on any of these crimes.

The lack of a correlation between the presence of a restraining order law and the outcome measures in Table 6 generally supports our findings regarding IPHs. A priori, we would not expect the restraining order laws to have an impact on property crime. Even if batterers are more likely to commit other criminal acts, there is no reason to expect a change in motor vehicle thefts or burglaries when access to firearms is reduced. However, it is not clear whether we would expect to observe a relationship between these laws and rates of violent crime. Given that batterers are more likely to engage in violence against strangers and acquaintances than people who do not engage in domestic violence (Fagan and Browne 1994), we would expect these laws to lead to a reduction in crimes of violence on the margin. Without knowing what proportion of violent criminals are domestic abusers who would be subject to these laws, however, it is difficult to speculate on the expected magnitude of this effect.

The other two types of law are more difficult to interpret. Having a domestic violence misdemeanor law in place is weakly associated with higher rates of rape and assault. The confiscation law is significantly associated with higher rates of assault and burglary. It is possible that these effects in part represent substitution by batterers into less lethal violence, or

TABLE 6: State Domestic Violence Gun Laws and Other Crimes

	Incidence Rate Ratios (IRRs) (95% Confidence Intervals in Parentheses) (N = 966)					
	Stranger Homicides	*Rapes*	*Robberies*	*Assaults*	*Burglaries*	*Motor Vehicle Thefts*
Restraining order law	1.01	1.00	1.01	1.00	0.98	0.96
	(0.81, 1.26)	(0.93, 1.08)	(0.91, 1.12)	(0.88, 1.14)	(0.93, 1.04)	(0.87, 1.06)
Domestic violence misdemeanor law	0.98	1.08*	0.97	1.12*	0.98	0.93
	(0.81, 1.18)	(0.99, 1.18)	(0.86, 1.08)	(0.99, 1.27)	(0.93, 1.03)	(0.82, 1.04)
Confiscation law	1.11	1.04	1.08	1.19***	1.09***	1.05
	(0.94, 1.32)	(0.98, 1.11)	(0.96, 1.21)	(1.06, 1.33)	(1.03, 1.16)	(0.94, 1.17)

NOTE: State-year panel negative binomial regressions from 1982 to 1998 with state and year fixed effects and region time trends. For interpretation of IRRs, see note in Table 5. Regressions also include all control variables used in Table 5; column 1 does not control for stranger homicides.
*$p < .10$. ***$p < .01$.

a backlash by angry abusers. However, if there were substitution into nonlethal violence, we would expect to find a corresponding reduction in IPHs. Because we do not find such a reduction for these laws, the results suggest that the domestic violence misdemeanor and confiscation variables may be capturing the effect of an omitted variable that had a positive impact on certain types of crime.

DISCUSSION

Study results lead us to cautiously conclude that laws restricting access to firearms by abusers under restraining orders reduce IPHs. After a state passes such a law, IPH rates are lower by 8%, or an average of 2.9 homicides per year. The effect is slightly larger for individuals killed with a firearm, around 9% (2.0 homicides per year). The impact of these laws is concentrated primarily on female victims: Female IPH rates are 8% lower (2.0 homicides per year), and female firearm IPH rates are 10% lower (1.6 homicides per year). The effect of the restraining order laws is confined to states that prohibit the purchase of firearms and those that have the ability to check a database of those under restraining orders against persons applying to purchase a firearm. These states experience between three and four fewer IPHs per year on average, of which 2.8 would be committed with a firearm. Of this decline, approximately 2.5 are female victims, 2 of whom would have been killed with a firearm. We find no evidence of an effect from domestic violence misdemeanor laws or laws that allow police to confiscate firearms at a domestic violence scene.

Our results have several important policy implications. One is that laws restricting access to firearms by individuals subject to a restraining order are an effective way to reduce IPH rates. Furthermore, policy makers need to consider that certain characteristics of these laws impact their effectiveness. Specifically, our results show that prohibiting possession of firearms without explicitly prohibiting firearm purchases as well appears to undermine the effectiveness of a restraining order law. It is unclear why this is the case. It may simply be that it is easier to enforce firearm restrictions at the point of purchase than to ascertain whether an individual already owns a firearm. One way to increase the potential effectiveness of possession-only laws would be to maintain a registry of all firearm owners. Finally, it is clear that the effectiveness of the restraining order laws relies on the ability of law enforcement and firearm dealers to determine whether an individual is, in fact, prohibited from purchasing or possessing a firearm. Designing methods

for the accurate and real-time entry of court order data into computer systems and facilitating database sharing between courts, law enforcement agencies, and FFLs are steps that should be taken to help increase the ability of states to enforce these laws.

There are several reasons why we might expect the restraining order laws to be more effective than either the confiscation or domestic violence misdemeanor laws. One concern with the domestic violence misdemeanor laws is that inadequate or insufficient record keeping might prevent some of these individuals from being identified as prohibited persons, thereby enabling them to acquire or possess firearms without detection. This would diminish any impact of the laws on reducing IPHs. Many domestic violence related misdemeanors do not specifically mention domestic violence in the statute but are classified as general crimes committed against a family member or intimate partner. This makes the identification of a misdemeanor restriction inherently more difficult than determining whether there is an outstanding restraining order and could be one explanation for why we find no effect even in states that have better access to data. Developing better mechanisms for flagging crimes as being domestic violence related and enacting statutes that specifically incorporate domestic violence would greatly enhance states' ability to identify individuals who are legally prohibited from access to firearms.

Second, because the number of people excluded from owning or possessing a firearm under the state restraining order laws is likely to be quite a bit larger than the number excluded under state domestic violence misdemeanor laws over the time period in our analysis, we would expect the impact of the latter to be much smaller and, therefore, more difficult to detect.[14] We lack sufficient information to assess the number of people potentially affected by the confiscation laws, so it is unclear whether a similar issue applies.

Third, the timing of these laws may affect our ability to measure any effect. The majority of these laws were passed right around the time of or subsequent to the VAWA. It is possible that the impact of the federal domestic violence laws, which are swept into the year indicator variables, dominates any small additional effect of the state misdemeanor or confiscation laws. Additionally, for the domestic violence misdemeanor laws, the difference between state laws and the Lautenberg Amendment is likely to be less pronounced than that of the restraining order laws and their federal counterparts given that temporary restraining orders are more prevalent than permanent orders. It is interesting to note that in many cases, the incident rate ratios for the confiscation law and domestic violence misdemeanor law are in the expected direction. We may simply not have a large enough sample

to detect a significant impact of these laws given the number of states that have them, the timing of the laws, and the lack of remaining variations once other laws are held constant.

Previous evaluations of the effect of laws restricting access to guns by certain individuals on violent outcomes have been mixed. One study of subsequent arrest rates for violent crime by felons showed that arrests were 19% lower than they would be had felons not been excluded from purchasing handguns (Wright, Wintemute, and Rivara 1999). A similar study for misdemeanants also found that the California violent misdemeanor conviction restriction significantly reduced subsequent violent crime arrests by 22% (Wintemute et al. 2001). However, there also is evidence that people with a misdemeanor conviction are significantly more likely to commit a serious crime in the future (Wintemute et al. 1998). Our own previous results (Vigdor and Mercy 2003) found a much larger effect of the restraining order laws than we find in this study. However, the difference between our previous results and the current study is almost entirely explained by the additional years of analysis rather than the addition of the new information about confiscation laws.

Overall, our results are generally consistent with the findings of these previous studies. Moreover, both the direction and magnitude of the effects are consistent with a policy that prevents a portion of abusers from gaining access to firearms in volatile domestic circumstances or deters abusers who already possess guns from using them abusively to avoid losing access to their guns.

Our findings regarding the domestic violence misdemeanor and confiscation variables, however, cause us to be somewhat cautious in drawing firm conclusions about the effectiveness of the restraining order laws. Specifically, we are concerned by the fact that these laws are positively associated with several types of crimes but have no effect on IPHs. This suggests that these laws may be capturing the effect of some omitted variable and raises the concern that perhaps this omitted factor is affecting the restraining order law as well. However, the fact that we find no relationship between the restraining order law and crimes other than IPHs gives us greater confidence in our restraining order law findings.

One possible omitted factor that could affect our restraining order law results is the impact of the Brady Handgun Violence Prevention Act of 1993, which required background checks for certain firearm transfers. However, most of the states that have restraining order laws in our sample were actually exempt from the Brady Act by the time their restraining order law was passed. If the Brady Act decreased IPHs in other states over this period, our results would be biased toward finding no effect of the restraining order laws.

Previous research suggests that the Brady Act may not have had a measurable impact on homicides, so any bias in this case is likely to be small (Ludwig and Cook 2000).

It also is possible that our measure of the restraining order laws is actually capturing the effect of other state legislation designed to reduce domestic violence. For example, Dugan, Nagin, and Rosenfeld (1999) found that the availability of hotlines and legal services had "a statistically stable and negative impact on the rate at which wives murder their husbands" in the 29 large cities they studied. If states are passing comprehensive domestic violence legislation that includes funding for these programs as well as restraining order laws, it would not be possible to distinguish between the effect of the firearm laws and the other social programs or legal changes. Preliminary investigation suggests that states are not enacting these laws as part of a comprehensive domestic violence policy reform, but further research is needed to rule this out with certainty. It is noteworthy that, even if we are measuring the overall impact of domestic violence legislation and not that of the restraining order laws, this legislation seems to have had a significant effect in reducing IPHs.

Our article has several additional limitations related to data quality and availability. One issue is that the FBI's SHR data are known to underreport IPHs for reasons that have been reported elsewhere (Langford, Isaac, and Kabat 1998; Vigdor and Mercy 2003; Williams and Flewelling 1987). Unfortunately, there is no alternative source of data on IPHs that occur in the United States. Most important, however, we have no reason to suspect that underreporting is systematically associated with presence or passage of misdemeanor and restraining order laws restricting access to firearms by domestic violence offenders.

Another issue is that we cannot fully explore the variability with which these laws are enforced at the state level. Ideally, we would replace our simple indicator variables with a measure of dosage that captured enforcement and implementation of the laws in each state. Unfortunately, no data exist by which to do this. We were able to demonstrate that the positive benefits of these laws were restricted to those states that could identify individuals under the authority of a restraining order in state databases. This suggests that enforcement does, indeed, play an important role in the effectiveness of these laws. Future research should further explore the role of enforcement in the implementation and effectiveness of these laws.

Another data limitation that prevents us from fully understanding the impact of these laws is that we are unable to examine domestic violence outcomes other than homicides. The small reduction in nonfirearm homicides suggests that the absence of a gun may also reduce nonfirearm violence,

which would suggest that we are underestimating the impact of the laws on domestic violence as a whole. In addition, small sample sizes prevent us from further breaking down our analysis by different racial groups. Given that levels and patterns of IPH rates vary substantially by race (Paulozzi et al. 2001), this type of analysis is crucial to understand the impact of domestic violence laws. Additional studies are needed to assess the impact of these laws on outcomes other than IPHs and to further explore racial differences. We also are prevented by small sample sizes from examining the impact of various combinations of the types of laws in a particular state. As more time passes and more state pass these laws, this will be an important area for future research.

Finally, our findings reflect the impact of these laws on IPHs at the state level only. Restraining order, domestic violence misdemeanor, and confiscation laws may have important effects on individuals and families. The aggregate results are contingent upon the ability and will of a state to enforce them to the extent that an effect is measurable. The fact that we found any effects in the face of these impediments for the restraining order laws suggests that these laws do play a role in reducing IPHs. The fact that we did not find an impact of the other laws certainly does not imply that there are not individuals and families who have benefited from these laws. Indeed, given the tremendous cost to society of domestic violence, even a small reduction in domestic abuse would generate large economic benefits. Further research should be conducted at both the individual and aggregate level to confirm the findings of this research.

NOTES

1. 18 U.S.C. § 921 (a)(32) defines intimate partner as a spouse, a former spouse, an individual with whom the person has a child in common, and an individual who cohabitates or has cohabited with the person.

2. This component of the Gun Control Act was recently challenged in *United States v. Emerson* (1999). The U.S. District Court for the Northern District of Texas dismissed the case on the grounds that the federal law denying guns to those under restraining orders violates the Second Amendment constitutional right of these individuals to bear arms. In October 2001, the U.S. Court of Appeals for the Fifth Circuit reversed the decision. The Fifth Circuit ruling was notable because it concluded that the Second Amendment does protect an individual right to own firearms, but the federal law prohibiting restraining order subjects from owning firearms was an acceptable limitation of that right. This marked the first time that a federal appellate court has suggested that the Second Amendment guarantees an individual right to bear arms. The U.S. Supreme Court declined to hear the case on appeal, and Emerson was subsequently convicted in the District Court.

3. For example, violating a protection order may be a misdemeanor in a particular state, but unless violating a protection order requires the use of force, this will not be a qualifying misdemeanor *even if* the order is violated by the use of force (Groban 1999).

4. The Lautenberg Amendment contains two particularly controversial elements. First, it is retroactive in the sense that any prior qualifying domestic violence misdemeanor invokes the law. Second, unlike the restraining order prohibition, it is not subject to the public interest exemption. This means that it is illegal for police officers and members of the armed forces who have a domestic violence conviction to possess weapons, even while on the job. The Lautenberg Amendment has been subjected to numerous legal challenges on a variety of constitutional grounds, but to date the law has been upheld in every case. See Nathan (2000) for a good discussion of the legal challenges.

5. We do know this information for certain locales. For example, in California, 87% of the 227,941 restraining orders in effect in June 2003 included a firearm purchase prohibition (Sorenson and Shen 2005). California mandates the inclusion of this prohibition on certain restraining orders, so this figure is likely to be higher than in many other states.

6. See Vigdor and Mercy (2003) for a more detailed discussion of these factors.

7. Ideally, we would also like to examine the impact of the federal laws on domestic violence outcomes, but this is quite difficult since there is no time variation across states. One approach would be to follow Ludwig and Cook (2000) and classify states that already had laws prior to the passage of the federal laws as control states, comparing their outcomes to the states that are now subject to the laws for the first time. The problem with that approach in our case is that the timing of the state laws makes it difficult to assign a control group. For the restraining order laws, the majority of states passed their laws just after the Violence Against Women Act (VAWA), and several more enacted their legislation earlier in the same year. Many of the domestic violence misdemeanor laws also coincide with the passage of the VAWA.

8. Even though goodness of fit tests suggest that the Poisson model does not fit our data as well as the negative binomial, we obtain very similar results (both coefficients and standard errors) with both Poisson and negative binomial regression.

9. One concern with time series data is the possibility that the error terms are correlated over time, which could affect the efficiency of the coefficients. To examine whether serial correlation was present, we plotted the residuals for each state against the preceding year to see whether any states had residuals that were persistently above or below the mean. All states appeared to exhibit quite a bit of randomness. The scatterplots of four states (Georgia, Tennessee, Illinois, and Indiana) were suggestive of serial correlation, with 5 or 6 consecutive years above or below the mean (but still fluctuating above and below the mean over the total period). We fit our main models without these four states. The standard errors rose slightly, but not enough to change the substance of our results. Therefore, we conclude that serial correlation is not a major problem for us.

10. These states are Florida, Kansas, Maine, and Montana. These four states were missing at least two consecutive years of homicide data.

11. Ideally, we want to control for age-specific marriage rates. However, these data are not available for all states nor for the entire time period we examine.

12. There may be some concern that any measure of firearm prevalence would be endogenous because of reverse causality. We would expect these laws to reduce the prevalence of guns in a population, even though the effect may be minimal compared to the overall level of gun ownership. However, including this measure has virtually no effect on the coefficients or significance levels of our explanatory variables of interest.

13. We restricted our analysis to victims older than age 10 to capture as high a proportion of intimate partner homicides as possible. The laws in question are targeted at adult perpetrators of

intimate partner violence, some of whom may have younger partners. Based on prior analyses of these data, we estimate that less then 0.5% of intimate partner homicides occur in those 10 to 14 years old.

14. This is because most of the state laws were either (a) not retroactive prior to the date of passage or (b) subject to a time limit (e.g., conviction in past 3 years).

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