
Firearm Retailers' Willingness to Participate in an Illegal Gun Purchase

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ABSTRACT *Firearm-related violence is a significant public health and public safety problem for cities in the USA, and licensed firearm retailers are an important source of the guns used in that violence. Using a scripted telephone interview, we screened a sample of licensed retailers in California to assess their willingness to participate in the surrogate or “straw” purchase of a handgun; such purchases are illegal under federal law. Of 149 retailers who provided a response, 30 (20.1%) agreed to participate. In multivariate analysis, pawnbrokers were more likely to agree than were gun dealers (odds ratio 6.58, 95% confidence interval 1.99–21.71). Sales of handguns that were later subjected to ownership tracing (a proxy measure for a gun’s use in crime) were not more frequent among retailers who agreed to participate than among others, and other findings were unexpected as well.*

KEYWORDS *Firearms, Handguns, Crime, Gun Policy, Violence*

INTRODUCTION

Nearly 315,000 violent crimes, including an estimated 10,886 homicides, were committed with firearms in the United States in 2008.^{1,2} Firearm violence is particularly a problem for America’s major urban areas,³ and federally licensed retailers are important sources of these guns.⁴ Of persons incarcerated during the 1990s for gun crimes, 12% to 19% of those in state prisons⁵ and 19% of those in federal prisons⁶ purchased their guns personally from a gun dealer or pawnshop. An unknown but substantial number of others illegally use surrogate or “straw” purchasers to acquire guns from licensed retailers indirectly.⁷ Licensed retailers who are themselves corrupt are linked to nearly half (48%) of guns that are trafficked—intentionally diverted into illegal commerce.⁷

Linking Retailers to Crime Guns

Several methods are available to identify retailers who are frequent sources of crime guns. The most common relies on available data; it is to measure the number of guns a retailer sells that are later subjected to ownership traces by the Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF).⁸ Traces are performed by ATF on guns recovered by police agencies worldwide, usually in connection with a crime. A completed trace begins with the gun’s manufacture and ends with its first retail sale.

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In 1998, just 1,020 (1.2%) of 83,272 licensed retailers accounted for 57.4% of all traced guns.⁹

Importantly, the number of guns traced to a retailer is not simply a function of the number of guns that retailer sells. A minority of retailers is associated with *disproportionate*, not just frequent, sales of crime guns.^{10,11} In a California study of retailers with at least 100 handgun sales per year, the 11.2% of retailers with disproportionate sales of crime guns accounted for 17.9% of all handguns sold by study subjects but 46.1% of handguns that were later used in violent or firearm-related crimes.^{10,11} Several factors are associated with disproportionate sales of crime guns.^{10,11} Most are characteristics of the retailers or of their clientele, not of the communities in which the retailers are located. These findings have suggested a second available data strategy for identifying retailers who may be important sources of crime guns: determining the percentage of each retailer's proposed sales that are denied when criminal background checks show prospective purchasers to be prohibited persons.^{10,11}

While available data may yield useful screening tools, they do not address the question of retailer intent. A key question remains: Do disproportionate sales of crime guns reflect purposeful behavior by the retailer, simple negligence, or circumstances beyond the retailer's control?

Several investigations have therefore assessed retailer behavior directly, either by passive monitoring or by observing the response to a predetermined stimulus, such as a proposed illegal gun purchase. A large study of gun shows demonstrated that straw purchases were to some extent concentrated at "hotspot" retailers and sometimes appeared to involve the full and knowledgeable participation of the retailer.¹² Working undercover, police officers or private investigators from several major cities have proposed sham straw purchases to selected retailers, already identified as important sources of crime guns, to determine their willingness to participate in illegal sales.^{13,14} Investigators working for the city of New York recently screened retailers at seven gun shows and proposed sham straw purchases to those whose behavior suggested that they would be "vulnerable targets."¹⁵ The positive predictive value of the screening process, the details of which were not published, was 94% (16/17).

Direct, on-site observation provides persuasive evidence but is not feasible on a large scale. Costs for the New York gun show study totaled at least \$3,311 per gun seller screened and \$30,000 per gun seller tested.^{15,16} A much less expensive approach is to solicit participation in an illegal act, such as a straw purchase, by telephone. Sorenson and Vittes used this technique to assess 120 licensed gun retailers, selected from an Internet business directory, in 20 large cities across the country.¹⁷ Of the 40 retailers who were told that "my girl/boyfriend needs me to buy her/him a handgun," 21 (52.5%) agreed to make the sale.

The Current Study

This study applies the Sorenson and Vittes technique, with some modifications, to a larger population of retailers about whom a great deal of additional information is available.¹¹ This information concerns sales of traced guns, gun sales overall, the nature of guns sold, attributes of the clientele, and characteristics of the specific place and larger community in which the retailer is located. Our primary hypothesis was that retailers who agreed to participate in a straw purchase would be more likely than others to be identifiable independently as important sources of traced crime guns. Based on our prior findings,^{10,11} we also hypothesized that retailers who

agreed to participate would sell more guns than others did, would sell proportionately more inexpensive guns, would have a higher percentage of denied purchases, and would more likely be pawnbrokers and located in a central city or other urban environment.

METHODS

Study Design, Setting, and Subjects

This is a cross-sectional study. The 300 subjects, all federally licensed handgun retailers in California, were initially the topic of a case-control study of retailers with disproportionate sales of crime guns. The formation and characteristics of the study population have previously been described.¹¹ In brief, subjects were identified from among all retailers who sold handguns for at least one of the years 1998–2003 and averaged at least 50 handgun sales annually for their years in business during that period. Sixty retailers were associated with disproportionate sales of handguns that were later traced. “Disproportionate” was defined as having an actual number of traced handguns that exceeded the number predicted by aggregate data for all eligible retailers, by a margin that reached statistical significance ($p < 0.05$). The other 240 retailers were a random sample of the eligible non-cases, serving as controls.

Variables and Data Collection

The California Department of Justice (CDOJ) provided records for handgun sales by licensed retailers and for proposed sales that CDOJ denied under laws prohibiting felons, violent misdemeanants, and certain others from purchasing firearms (in California, almost all transfers of firearms, including those between private parties, must be processed by a licensed retailer). ATF provided records for all gun traces initiated during the study period, regardless of the location of the requesting law enforcement agency. CDOJ and ATF records covered the years 1998–2003.

Variables obtained from these data fell into three classes: relating to the retailer, to the retailer's clientele (including those whose purchases were denied), and to the general socioeconomic environment of the county in which the retailer was located.^{10,11} A variable for urbanicity of the retailer's specific location was taken from site visits, which were conducted by the author during August–December 2004 (with few exceptions, other site visit variables had been shown not to be associated with disproportionate sales of crime guns).¹¹

Two female staff members were trained by the author as callers. A script involving a request for assistance with a questionable gun purchase (detailed below) was prepared following the model developed by Sorenson and Vittes¹⁷ (personal communication, Sorenson SB, 2005), with minor modification. Responses to anticipated questions or remarks were drafted by the author and rehearsed by project staff. Callers were trained to interact with a wide variety of potential respondents. They then each contacted a random sample of 15 retailers who were not part of the study population for final simulation training. This also provided a pilot test for the script, which was revised as needed.

Telephone calls were made during April–June, 2005. During this time callers were regularly debriefed by the author and senior program staff to address any unforeseen difficulties that had arisen.

The script proceeded as follows: After verifying that the respondent was the subject retailer and still sold handguns, the caller said, “I need to buy a gun for my

boyfriend. He knows what he wants, but asked me to buy it for him. Can I do that?" To requests for more information, such as about the gun the boyfriend wanted or his eligibility to purchase for himself, the caller responded that she did not know. If asked whether the purchase was a gift, the caller responded that it was not; the boyfriend just wanted her to purchase it on his behalf. If asked further about financial details, the caller indicated that the purchase was to be for cash and with the boyfriend's money; the gun was for the boyfriend, but the caller was to be the purchaser. If the retailer's response was negative or equivocal, the caller followed up with "I'd really like to help him out" or "Is there some way to make this work?" If the response was positive, the caller asked "How do I do that?" or "What do I need to do?" and if the information had not already been provided, "Do I need to bring anything?"

Callers were given no information about the retailers they were contacting other than a name, telephone number, and address. Calls were not recorded. Immediately after concluding each call, callers completed a data form and made detailed notes. The data forms and notes were reviewed by the author as data collection was underway to screen for unanticipated problems.

In most cases, the retailer's final answer was a straightforward yes or no. There were ambiguous responses, however, of two types. Some retailers gave a nominally positive response to the caller's question when in fact they were recommending a purchase by the caller and a follow-up private party transfer to the boyfriend. In California, as these retailers explained, this would require a second purchase application to be completed by the boyfriend, a background check to verify his eligibility to own guns, and an additional fee. It seemed clear that their positive response was not endorsing an illegal straw purchase, but rather a legal retail sale followed by a legal secondary market transaction. These retailers were classified as having provided a qualified yes.

In other cases, the retailer's nominal response was negative but was accompanied by information, and in a few cases explicit coaching, on how the caller could complete a straw purchase. Still others, while saying no, indicated that this was because the caller had told them the nature of the transaction and that they would ignore the caller's intent if she were to come to the store. These respondents were classified as having provided a qualified no.

The callers' notes were also reviewed to identify cases in which retailers had specifically stated that the purchase as proposed was illegal or used any form of the phrase "straw purchase."

Statistical Methods

As before,^{10,11} we replaced each retailer's handgun sales volume with an estimate of gun-years of exposure to the risk of being traced during the study period for that retailer's handguns. Record-based variables for subsets of handgun sales were expressed as percentages of total gun-years of exposure. The frequency of gun tracing was expressed as traces per 1,000 gun-years of exposure.

Continuous variables were generally not normally distributed and were summarized using medians and interquartile ranges. Results for responding and nonresponding retailers were compared using the Mantel-Haenszel Chi-squared test for categorical variables and a two-sided Wilcoxon's rank sum test for continuous variables. Logistic regression with odds ratios (ORs) and 95% confidence intervals (CIs) was used to quantify relative risks for the outcome of interest. A multivariate model was generated by entering all variables with $p \leq 0.30$ in bivariate regression

with purposeful backward elimination until all remaining variables had $p \leq 0.10$. Because of the likelihood of endogeneity, variables specifying whether or not the retailer described the proposed sale as “illegal” or as a “straw” transaction were not included in the multivariate model. Interaction terms for all variable pairs in the reduced model were tested.

The main analysis was restricted to cases in which the retailer’s response was unambiguously positive or negative. Sensitivity analyses were conducted by adding the qualified responses coded either according to their nominal intent or to their actual intent as inferred by us. The Hosmer–Lemeshow test was used to assess goodness of fit for multivariate models.

Approval

The study was approved by the UC Davis Institutional Review Board.

RESULTS

Of 300 retailers in the study population, 57 were not contacted because they were known from both administrative records and site visits to be out of business, were on military installations, or could not be located (Figure 1). Another 11 were found to be listings for additional licenses at a single business address. Of 232 retailers for whom contacts were attempted, 15 could not be reached, 61 no longer sold handguns, and 7 had no inventory at the time of the call, sold only at auction, or sold only to police personnel. Of the 151 retailers from whom no response was obtained, at least 114 (75.5%) were no longer in business or no longer selling handguns (Figure 1).

The 149 responding retailers and 151 others differed with regard to several variables that have previously been associated with disproportionate sales of traced guns (Tables 1 and 2 display principal findings; complete results are in Supplemental

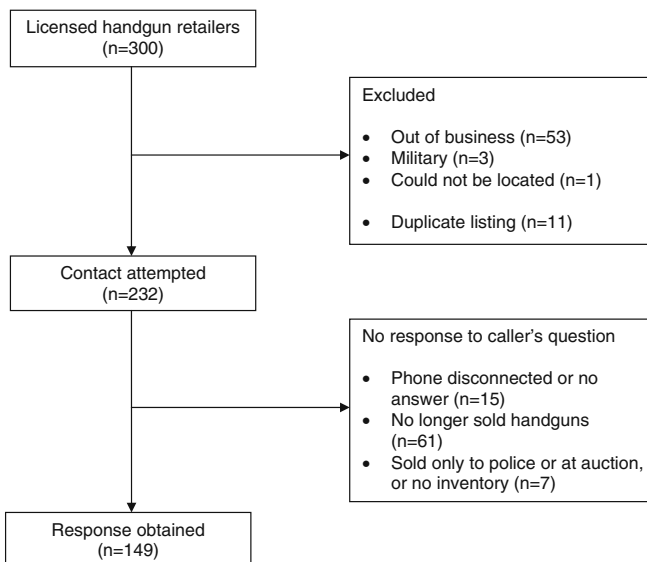


FIGURE 1. Flow diagram showing exclusions and reasons for which retailers did not provide a response.

TABLE 1 Descriptive statistics for 149 retailers who provided a response and 151 others (categorical variables)

Characteristics	Responders <i>N</i> =149		Nonresponders <i>N</i> =151		<i>P</i>
	<i>N</i>	%	<i>N</i>	%	
<i>Retailer characteristics</i>					
Licensed as pawnbroker	24	16.1	40	26.5	0.028
Nature of retailer's location: center city/urban (as compared to suburban, small town, or rural)	32	21.5	46	30.5	0.077

Because the descriptive statistics differ, categorical variables and continuous variables are listed separately

Table 1 in the Electronic Supplementary Materials, available online). Some of these differences suggested a lower risk for responders; others suggested the opposite. Gun tracing rates did not differ between the two groups.

Of the 149 completed responses, 30 (20.1%) were positive, 104 (69.8%) were negative, 5 (3.4%) were qualified positive, 9 (6.0%) were qualified negative, and 1 could not be classified. Of the 30 positive responses, 14 included an explicit warning that the caller would be responsible for what her boyfriend did with the gun. Example responses are in Table 3.

Bivariate regression results are in Tables 4 and 5. Calls made by one staff member were less likely to return a positive response than were calls made by the other (OR 0.26, 95% CI 0.11–0.62). Pawnbrokers were more likely than other retailers to respond positively (OR 3.50, 95% CI 1.35–9.10); those who described the purchase as illegal or as a “straw” transaction were less so. There was no association between a positive response and the frequency with which a retailer's guns were traced, with the percentage of sales that were denied because the purchasers were ineligible, or with most other characteristics of the retailer, the retailer's clientele, or the retailer's community. Given the strong caller effect, bivariate regressions for all other variables were repeated with the caller variable

TABLE 2 Descriptive statistics for 149 retailers who provided a response and 151 others (continuous variables)

Variable	Responders <i>N</i> =149		Nonresponders <i>N</i> =151		<i>P</i>
	Median	IQR	Median	IQR	
<i>Retailer characteristics</i>					
Gun-years of exposure (×1,000)	2.5	1.3–6.1	1.2	0.8–2.2	<0.0001
Traced guns per 1,000 gun-years	1.3	0.5–2.7	1.5	0.4–3.6	0.27
Gun-years from sales of multiple guns (%) ^a	6.4	4.0–9.6	9.1	5.5–14.6	0.0001
<i>Clientele characteristics</i>					
Denials, % of (sales+denials)	1.9	1.3–2.4	1.7	0.8–2.5	0.062

Because the descriptive statistics differ, categorical variables and continuous variables are listed separately
IQR interquartile range, *CI* confidence interval

^aSales of more than one handgun in a single transaction (which became illegal in California in 2000)

TABLE 3 Examples of retailer responses to the question, "I need to buy a gun for my boyfriend. He knows what he wants, but asked me to buy it for him. Can I do that?"*Responses coded as "No"*

The gentleman said I could pay for the gun, but I could save \$30 by not paying the registration fee twice. I could buy it and register it in my name and pay the \$30, if it was a gift for my boyfriend or something. Then my boyfriend would need to register it in his name and pay registration fees again. I asked him if I could buy it and give it to my boyfriend. He said "Noooooooooooo, that is an illegal purchase of a handgun." He said that is a federal crime and there is a question on the federal document asking if I was going to be in possession of the gun. And if I answer that wrong, that is perjury and I will have the Feds involved.

"No, that's not legal. If he wants to come in and buy it, he has to take a handgun safety certificate test, he has to be over 21, and we have to do a background check on him. I wouldn't sell you a gun if it's for your boyfriend. It's a straw sale. That's a felony. You can pay for it but he has to do the background check."

"You can purchase it for him but he has to do the registration. If you purchased it and put it in your name and it was used in a crime or it was stolen, it would be found in your name. You don't want to do that. If they found it at a crime scene, it would be traced back to you. I followed up with 'So I can't help him out?' and he responded, 'You can purchase it for him but he has to do the registration.'"

Responses coded as "Yes"

He said "yeah" I could do it and asked if I had handgun safety training in the State of California.

He said I had to take a \$25 state test that is 30 questions long. Then I need to bring a utility bill that is 3 months old with my address on it. He said I could do what I asked, but I needed to study for the test first because I could take it, then I could buy the gun and do all of the paperwork.

The man asked if I "needed" to buy it for him. I told him my boyfriend wanted me to. He said "Oh, I get it" and laughed a little and said yes, I could. I asked what I needed to bring with me and he asked if I was a California resident. He said I needed my driver's license and my registration with the same address as my license, or a utility bill with my current address. He stated if they didn't have the gun I needed, they would order it and take care of me.

He said yes I could and told me to "say it is for you, though." He said, "you don't want to...you know." He said I needed to take an exam. He stated it sounded like I never bought a gun before. He said it's 50 cents for a handbook to study. It's a 30 question test that is \$25 and lasts for 5 years, if I want to buy any more guns. Then I need proof of residency like a phone bill or utility bill. He said after the gun is paid in full, then my 10 day waiting period starts.

"Yes," including a warning

The gentleman said I could buy the gun, but if anything happens to it, I am responsible. He said I could register it in my name, but if my boyfriend does something with it, it will come back to me. He also said I could pay for it and do the background check on me and my boyfriend can register it and it would cost him \$75. He said he just wanted to make clear to me that if I register it and give it to my boyfriend and we break up, I am still responsible. He said if I had it stolen or lost it, to report it. He said you could still do it, but it's up to you.

The gentleman said the gun would be in my name and asked if I knew this. He said if I wanted to come in and do all of the stuff in my name and my boyfriend goes out and shoots somebody and I am willing to take the rap for it, then I could. After telling him that was fine, he said he really wasn't supposed to know what I was doing with the gun after I left. He said I needed to bring a valid ID and the money when I come down.

"Yes," describing purchase as illegal or as a straw transaction

The gentleman said he could sell me a handgun. He said my boyfriend would need to come down and do the paperwork. He said if he did sell me the gun, it is called a straw "purpose" and he and I could both go to jail. He said now if I came in and bought it, whatever I did after I left was of no concern to him. He stated again he could sell me one.

Responses coded as "Qualified Yes"^a

He said yes, but I first needed [a Handgun Safety Card], which is \$25 and 30 questions. He said then I needed to do a background check that is an additional \$25 on top of the price of the gun. I will then have to wait 10 days before I can pick up the gun. I asked if at that point I could pick it up and give it to my boyfriend. He said "yes, but the right way." He said I needed to transfer it into my boyfriend's name, which costs an additional \$45, and then my boyfriend will need to pay and take the HSC test and the same for the background check. He said California states it needs to be in my boyfriend's name.

Responses coded as "Qualified No"^b

The gentleman said "technically no." He said there is a thing called a Straw Purchase Bylaw and because I told him my intent, I cannot buy a gun in my name and give it to my boyfriend. For all the man knew, my boyfriend could be a felon and not supposed to have the gun. I can come in and get a gift certificate that my boyfriend can use. Or I can buy the gun and my boyfriend can come in and register for it. I then followed up with, "I couldn't do it?" He said if I didn't tell them and I just came down and bought it and gave it to him, they wouldn't know.

"Yeah, if you're buying it for yourself, as long as you pass the background check through the DOJ, fill out the paperwork, and register it in your name. But no, you can't buy one for him. He has to buy it and register it in his name. If for whatever reason he can't pass a background check, I didn't hear that. In the future, if you are calling around and want to buy it for him, I would keep that mum."

^aA nominal "yes" response that appeared to be an endorsement for a sale to the caller followed by a legal private party sale to her boyfriend

^bA nominal "no" response accompanied by information on how the caller could complete a straw purchase

added. The results were unchanged (Supplemental Table 2 in the Electronic Supplementary Materials, available online).

In a reduced multivariate model (Table 6), strong effects remained for the caller, the retailer's status as a pawnbroker, and the retailer's location in a center city or urban area. Terms for interactions between each pair of variables in the reduced model were not significant.

Results for the sensitivity analyses, in which the qualified responses were added and coded according to either their nominal or inferred actual intent, were very similar to those for the main analysis (data not shown).

DISCUSSION

Twenty percent of the licensed firearm retailers in our study population agreed to assist a potential handgun buyer with a transaction that had many attributes of an illegal surrogate or "straw" purchase. Others, while saying no, offered the buyer concrete assistance in completing a purchase they appeared to understand was against the law. In multivariate analysis, pawnbrokers were more than six times as likely as gun dealers to give a positive response.

High as it is, our "yes" rate is much lower than the 52.5% found by Sorenson and Vitte.¹⁷ Differences in study populations may account for much of this. Our sample was drawn from all retailers exceeding a modest threshold sales volume in a state that regulates and polices gun commerce to a degree that is perhaps unique. In their study, retailers were drawn from an Internet business directory, which may cause high-volume retailers to be overrepresented, and were located throughout the country.

TABLE 4 Descriptive statistics and results of bivariate regressions (categorical variables)

Characteristic	Said "Yes" N=30		Said "No" N=104		OR	95% CI	P	
	N	%	N	%				
<i>Variables intrinsic to telephone call</i>								
Call made by staff member #1	9	30.0	65	62.5	0.26	0.11	0.62	0.002
Retailer described purchase as "illegal"	3	10.0	53	51.0	0.11	0.03	0.37	0.0005
Retailer described purchase as "straw"	2	6.7	30	28.9	0.18	0.04	0.79	0.023
<i>Retailer characteristics</i>								
Licensed as pawnbroker	10	33.3	13	12.5	3.50	1.35	9.10	0.01
In or <25 mi from city with comprehensive tracing	11	36.7	44	42.3	0.79	0.34	1.83	0.58
Nature of retailer's location: center city/urban (as compared to suburban, small town, or rural)	2	6.7	24	23.1	0.24	0.05	1.07	0.062

Variables are grouped by the entity they describe: the telephone call itself, the retailer, the retailer's clientele, or the county in which the retailer is located. Because the descriptive statistics differ, categorical variables and continuous variables are listed separately

OR odds ratio, CI confidence interval

Many of our findings were unexpected. First was the ambiguity of the purchase request as presented. An unexpectedly high number of retailers understood the transaction to be a gift, even though the script was designed to make it clear that this was not the case. Following Sorenson and Vittes,¹⁷ we had purposely not scripted a completely transparent request for assistance with a straw purchase, believing that this would not be realistic.

Second was the lack of association between a positive response and previously identified risk factors for disproportionate sales of traced crime guns.^{8,10,11} One possible explanation is simply that there is no association between a retailer's propensity to engage in illegal activity and that retailer's risk for selling guns that are used in crime. This fails a basic test of plausibility. Another is that at least some of those risk factors have been wrongly identified and that no association between them and propensity to engage in illegal activity (or risk for selling crime guns) should be expected. This is also unlikely, at least as a comprehensive explanation, since those risk factors have been identified in repeated studies on different populations using different methods.^{8,10,11,18,19}

However, the use of gun tracing data to gauge retailers' willingness to engage in unlawful activity, or even to measure their sales of guns that are later used in crime, has been questioned before.^{20,21} It is clear that not all crime guns are recovered by law enforcement agencies, that not all recovered guns are traced, and that selection bias may arise at each of these points.²² The impact of this will be less in states such as California, where many cities trace all recovered guns, than elsewhere.²³

TABLE 5 Descriptive statistics and results of bivariate regressions (continuous variables)

Variable	Said "Yes" N=30			Said "No" N=104			OR	95% CI	P	
	Median	IQR		Median	IQR					
<i>Retailer characteristics</i>										
Gun-years of exposure ($\times 1,000$)	1.8	1.0–2.8		2.8	1.5–8.7		0.90	0.81	1.00	0.063
Traced guns per 1,000 gun-years	0.9	0.0–2.6		1.3	0.6–3.1		0.94	0.79	1.13	0.51
Gun-years from sales of inexpensive handguns (%) ^a	1.5	0.5–8.2		1.1	0.3–5.0		1.01	0.97	1.06	0.56
Gun-years from sales at gun shows (%)	0.2	0.0–0.7		0.1	0.0–0.5		0.99	0.95	1.03	0.63
Gun-years from sales of multiple guns (%) ^b	6.4	4.0–9.9		6.5	4.1–9.8		1.00	0.93	1.07	0.90
Median time from sale to recovery (years) ^c	1.5	1.0–1.8		1.1	0.8–1.8		1.45	0.83	2.54	0.20
<i>Clientele characteristics</i>										
Gun-years from police sales (%) ^d	6.0	3.8–8.4		6.6	4.9–9.8		1.01	0.94	1.09	0.80
Denials, % of (sales + denials)	1.9	1.2–2.6		1.9	1.4–2.3		1.18	0.83	1.67	0.37
Median age of purchasers (years)	42.5	40–45		43	40–45		1.01	0.91	1.11	0.90
Male purchasers (%)	93.1	89.5–93.8		92.9	90.8–94.3		0.95	0.83	1.09	0.47
<i>County characteristics^e</i>										
Federal firearm licenses per 100,000 persons	8.4	4.5–20.4		6.6	4.2–15.0		1.02	0.99	1.06	0.21
Homicide per 100,000 persons	4.6	3.2–8.5		5.6	3.0–9.5		0.95	0.84	1.08	0.44
Rape per 100,000 persons	29.0	20.9–34.0		29.0	27.8–34.0		0.98	0.94	1.03	0.44
Robbery per 100,000 persons ($\times 10$)	9.9	6.7–20.0		12.4	8.7–26.5		0.98	0.93	1.02	0.25

Aggravated assault per 100,000 persons ($\times 10$)	34.2	23.4–51.7	36.2	31.1–53.9	0.98	0.96	1.01	0.22
Felony weapons offenses per 100,000 persons ^f	46.2	44.5–67.7	46.2	44.9–63.2	1.01	0.99	1.03	0.55
Misemeanor weapons offenses per 100,000 persons ^g	14.4	12.0–23.9	12.6	11.2–19.2	1.02	0.97	1.07	0.45
Black population (%)	3.8	1.6–9.1	5.7	2.1–9.8	0.96	0.86	1.06	0.40
Latino population (%)	30.8	19.0–44.6	31.7	18.4–44.6	1.00	0.97	1.03	0.84
Males ages 20–29, as % of males ages 40–44	187	165–208	188.5	170.5–208.0	1.00	0.99	1.01	0.99
Unemployed persons (% of persons ages ≥ 16)	4.9	3.6–5.2	5.0	3.6–5.2	0.93	0.69	1.25	0.61
Households headed by single females (%)	11.9	10.9–14.7	13.4	11.5–14.7	1.00	0.82	1.21	0.95
Median household income ($\times \$1,000$)	42.2	34.7–55.9	42.2	40.1–47.1	1.00	0.96	1.04	0.96
Households per 10,000 persons ($\times 100$)	32.9	32.8–36.3	32.9	32.5–36.3	1.03	0.91	1.17	0.64

Variables are grouped by the entity they describe: the telephone call itself, the retailer, the retailer's clientele, or the county in which the retailer is located. Because the descriptive statistics differ, categorical variables and continuous variables are listed separately

IQR interquartile range, *OR* odds ratio, *CI* confidence interval

^aHandguns manufactured by seven companies—Bryco Arms/Jennings Firearms, Davis Industries, High Point Firearms, Lorcin Engineering, Phoenix Arms, Raven Arms, Sundance Industries—whose handguns all had suggested retail prices of approximately \$150 or less; almost no such handguns were manufactured by other companies during the study period

^bSales of more than one handgun in a single transaction (which became illegal in California in 2000)

^cThe time between the dates of a gun's sale and its recovery by police, in years

^dSales to police agencies or individuals who were exempt, due to police employment, from California's required basic firearms safety course

^eFor the county in which the retailer is located

^fAn arrest rate. Examples: unlawful possession of a weapon on the person, in a vehicle, or in a public place (charged as a felony), unlawful possession of weapon in public building, possession of short-barreled shotgun or rifle, possession of firearm by felon, carrying firearm with intent to commit felony, obliterating firearm serial number

^gAn arrest rate. Examples: unlawful possession of a weapon on the person, in a vehicle, or in a public place (charged as a misdemeanor), possession of weapon with intent to assault, knowingly filing false firearm purchase application, selling firearms without a license, possession of unregistered assault weapon, sale of ammunition to a minor

TABLE 6 Reduced regression model

Characteristic	OR	95% CI		P
<i>Variables intrinsic to telephone call</i>				
Call made by staff member #1	0.23	0.09	0.59	0.002
<i>Retailer characteristics</i>				
Licensed as pawnbroker	6.58	1.99	21.71	0.002
Nature of retailer's location: center city/urban (as compared to suburban, small town, or rural)	0.10	0.02	0.57	0.01

Hosmer–Lemeshow goodness of fit test, $P=0.35$

The nature of our responding retailers may provide a partial explanation. The risk factor data were gathered for 1998–2003, and the interviews were conducted in 2005. Three-fourths of the nonresponders had gone out of business or were no longer selling handguns. In California, where retailers must also have state licenses, where the state Department of Justice has its own retailer inspection program and where enforcement is generally more active than elsewhere, it is possible that many of our nonresponders had been put out of business through enforcement action. If so, our unexpected findings may result in part from survival bias.

We believe the most important explanation is the ambiguity of the question we posed to retailers. By not portraying the nature of the purchase more explicitly, we may have created a screening test that was highly sensitive, but not specific enough. This is particularly important since sales of traced crime guns generally, and disproportionate sales of those guns in particular, are concentrated among a very small percentage of licensed retailers.^{8–11} Sorenson and Vittes conducted a sensitivity analysis in which 20 retailers were told, “My girl/boyfriend needs me to buy her/him a handgun because s/he isn’t allowed to.”¹⁷ Four retailers said yes to this unambiguous request for assistance in committing a felony, and their specific verbal responses were similar to those observed in this study.

Our findings are subject to several limitations. Precisely because of the unusual nature of gun commerce in California, generalizability is limited. Second, because our population was originally created for a case–control study of retailers with disproportionate sales of crime guns, such retailers are overrepresented. We anticipated that this might affect the frequency of our outcome of interest (though, as shown in Tables 4 and 5, this did not appear to occur), but it should not affect relative risk estimates.

Last is the strong association between saying “yes” and the staff member who placed the call. We deliberately had all calls placed by women in order to avoid a possible gender bias on the part of respondents and also because of the finding that women may figure disproportionately among straw purchasers.⁷ Callers adhered closely to the script, both in text and in tone. The caller with the higher proportion of “No” responses was a few years younger and had a significantly higher voice, and respondents may have been influenced by her perceived youth. The effect appeared to be independent of those for other variables, but more attention to elimination of factors that may give rise to an interviewer effect will be necessary in future studies.

These limitations notwithstanding, screening by telephone appears to hold promise as a cost-effective technique for cities impacted by gun violence and others to identify firearm retailers who may be willing to engage in suspect and illegal sales. Future studies will be needed to refine and validate this technique.

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