A Comparative Analysis of Crime Guns

MEGAN E. COLLINS, SUSAN T. PARKER, THOMAS L. SCOTT, AND CHARLES F. WELLFORD

Information is limited on how firearms move from legal possession to illegal possession and use in criminal activities, largely because of data collection capacity and a lack of recent, exhaustive recovery data across jurisdictions. This article includes both an analysis of firearms trace data and prisoner interviews across multiple jurisdictions: New Orleans, Louisiana, Prince George's County, Maryland, and Chicago, Illinois. Findings indicate that recoveries and trace successes vary across jurisdictions and by type of crime. Jurisdiction regulations were associated with the proportion of guns purchased in state and time to recovery but not with purchaser characteristics. Interviews from imprisoned offenders in two jurisdictions revealed the most common method of obtaining a crime gun was to steal it or buy it off the street.

Keywords: firearms and violent crime, transfer of firearms, criminal acquisition of firearms

Acknowledging that the Second Amendment to the U.S. Constitution guarantees the right of individuals to possess firearms, and that the overwhelming majority of those who own firearms use them in lawful ways, the public, policymakers, and law enforcement leaders nonetheless agree that criminals should not have access to guns, and certainly not for criminal purposes (see U.S. Supreme Court opinion in *District of Columbia v. Heller*, 554 U.S. 570 [2008]; for an analysis of this decision, see Gast 2005). Although violent crime has generally been declining since the mid-1990s,[1] firearms continue to produce a substantial threat to public safety,

Megan E. Collins is an associate with the Crime & Justice Institute at Community Resources for Justice. **Susan T. Parker** is senior data scientist at CivicScape. **Thomas L. Scott** is a PhD student in the Department of Criminology and Criminal Justice at the University of Maryland. **Charles F. Wellford** is professor emeritus in the Department of Criminology and Criminal Justice at the University of Maryland.

© 2017 Russell Sage Foundation. Collins, Megan E., Susan T. Parker, Thomas L. Scott, and Charles F. Wellford. 2017. "A Comparative Analysis of Crime Guns." *RSF: The Russell Sage Foundation Journal of the Social Sciences* 3(5): 96–127. DOI: 10.7758/RSF.2017.3.5.05. Authors are listed alphabetically to reflect their equal contributions to this article. The work of Collins, Scott, and Wellford was supported by a subcontract from the International Association of Chiefs of Police (IACP) as part of an award from the National Institute of Justice (The Epidemiology of Gun Crime). Susan Parker's work was supported by awards from the Joyce Foundation (Grant ID 13-34817) and the National Institute of Justice (2014-MU-CX-0013) to the University of Chicago's Crime Lab. Neither the Joyce Foundation, the IACP, nor the National Institute of Justice is responsible for the content of this article. Three anonymous reviewers provided very helpful comments, especially Reviewer A, whose observations resulted in very important modifications to the article. Direct correspondence to: Charles F. Wellford at wellford@umd.edu, 2220 LeFrak Hall, University of Maryland, College Park, MD 20742.

1. Acknowledging the 3.1 percent increase in the violent crime rate between 2014 and 2015, we refer here to the greater trend that saw the national violent crime rate decrease from approximately 636.6 per hundred thousand inhabitants in 1996, to 372.6 per hundred thousand in 2015 (FBI 2016).

and are utilized in a majority of homicides in the United States (for a detailed review of gun violence in the United States, see Cook and Pollack 2017). Overall, the lethality and seriousness of crime in the United States is greater than in any other industrialized democracy, largely because of the extent of gun possession and use by criminals (Cook and Pollack 2017; Wellford, Pepper, and Petrie 2005).

However, information on how guns are acquired for use in crimes is dated, incomplete, and inconclusive (Wellford, Pepper, and Petrie 2005); the collection of information regarding gun acquisition is made more difficult by limitations placed on the Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF) by Congress and other federal agencies.[2] As a result, useful information on how guns move from legal possession to illegal possession and use in criminal activities is extremely limited. In part, it was this condition that prompted the National Institute of Justice (NIJ) to form a topical working group on firearms and violence. The working group concluded that

> New efforts be undertaken to use improved methodologies to study and better understand the ways in which all criminals who use guns in the commission of their crimes acquire those guns. The first step in this effort would be the development of methodologies that would provide better estimates of gun acquisition than those used in the 1990 studies. . . . this research area should include studies of the "life cycle" of crime guns (tracing guns from the gun crime to the manufacturer, identifying all intermediate owners and possessors and their means of acquisition). This research would assist in identifying possible new ways to disrupt acquisition of guns for use in crimes. (NIJ 2011, 2–3)

These conclusions mirror those of a 2005 National Academy of Sciences report, which stated that "arguments for and against a market-based approach (to restricting access to guns) are now largely based on speculation, not on evidence from research" (Wellford, Pepper, and Petrie 2005, 8). This lack of actionable information about the sources of crime guns has made it more difficult for law enforcement leaders to develop effective, empirically based responses to violence in their jurisdictions.[3]

This article documents our efforts to better understand how guns that are used in acts of violence move from first legal sale to use in a crime in three jurisdictions: New Orleans, Louisiana, Prince George's County, Maryland, and Chicago, Illinois. To be clear, many guns used in crimes are obtained legally and may be used by the original purchaser; this article seeks to better understand both licit and illicit methods of acquiring crime guns. We do so using two sources of data: the trace results of guns recovered by law enforcement, focusing on those used in violent crimes, and surveys and interviews with individuals arrested for and convicted of gun crimes. Although these sources have been used in prior studies, this article is unique in that it assesses these data across three qualitatively different jurisdictions, which differ in their crime profile, composition, location, and the degree to which gun sales are regulated.

LITERATURE REVIEW

Despite the relative prevalence of gun crime in the United States, knowledge about the life cy-

2. Even though in recent years the Congress has reduced the limitations it imposed on the ATF that made it nearly impossible for the agency to provide trace data to law enforcement agencies and researchers, our research has faced numerous additional obstacles created by the agency that greatly lengthened the time it took to receive the information that the current law allows (for a summary of the history of these limitations, see http://smartgunlaws.org, accessed July 12, 2017).

3. For example, during a 2009 Police Executive Research Forum symposium on guns and crime, Paul Helmke of the Brady Center to Prevent Gun Violence remarked, "One of the crucial things is that it's hard to figure out where the guns come from. Guns start out in a legal market, but they fairly quickly get into an illegal market. One of the things we encourage every police department to look at it is where the guns come from. If we had a better idea of where the guns are coming from and how they get to the gangbangers, then we could figure out some strategies to stop them" (Kanter and Fischer 2010, 14).

cles of crime guns is lacking. A particularly large gap in research relates to how firearms become diverted from the legal, primary market, composed of manufacturers, wholesalers, and distributers, to the police recovering them in the hands of criminals. As policymakers continue to debate the merits of supply-side firearms legislation, understanding the breadth and nature of the licit and illicit marketplaces that control the flow of guns in the United States is critical.

Some of the guns used during the commission of violent crimes may be obtained through legal channels.[4] Research indicates, however, that few criminals purchase their firearms directly from licensed dealers (Braga et al. 2012; Vittes, Vernick, and Webster 2012; Wright and Rossi 1994). This is critical in the context of estimating the size of crime gun markets, given that only the size of the legal primary market may be reliably quantified at the national level.[5] Conversely, the field relies on estimates to approximate the sizes of the legal secondary market and the illegal market, the latter of which consists of guns obtained through straw purchase, unlicensed street dealers, theft, and other unlawful channels (Cook and Pollack 2017; Koper and Reuter 1996; Wright and Rossi 1994).[6]

It therefore follows that when firearms purchased exclusively through the primary market are recovered by law enforcement, the full history of the gun may be mapped out with a relatively high rate of success. Conversely, because of low levels of documentation, once firearms enter the secondary or illegal markets, tracing crime guns from first purchase to use in a crime becomes exceedingly difficult (Wellford, Pepper, and Petrie 2005). The firearms literature therefore is lacking in crime gun sources and details regarding the secondary and illicit firearms markets. Two methods previously used in attempts to identify sources of recovered crime guns also used in this study are firearms traces and interviews or surveys with known gun offenders. To date, many studies have been limited to certain geographies (as national reporting of most official gun data is prohibited), with nongeneralizable samples. This article seeks to improve on these by concurrently employing both trace and interview-survey methods across three distinct sites.

Trace Studies

Efforts to understand the scope and nature of the illicit gun market have relied largely on gun traces using ATF databases such as eTrace.[7] Because of restrictions on data collection and record sharing, these are almost exclusively conducted at the local level and require the local agencies' cooperation and willingness to share

4. Legally purchased guns may be acquired through either a primary market, which involves the retail sale of a firearm by a federal firearms licensee (FFL), or a secondary market, in which a firearm is transferred between two unlicensed parties (Cook and Ludwig 1996; Wachtel 1998; Cook and Pollack 2017). The primary market can include the wholesale transfer of guns as well as the retail sale of a single gun to a private individual; these sales typically occur in gun stores, sporting good outlets, pawn shops, and licensed in-home businesses. Conversely, the legal secondary market is more informal, occurring through newspaper or internet classified ads, word of mouth, gun shows, and purchases or gifting between family and friends (Cook and Pollack 2017).

5. Guns legally acquired through the primary market should be traceable to the initial sale, as FFLs must record the source and identifying properties of every firearm obtained and sold; additionally, the individual purchasing from the FFL must provide identification to ensure they are not prohibited from doing so (Cook and Pollack 2017).

6. Firearms obtained through the secondary market are often entirely lawful, but are not as easily traced or documented. Instead these transfers typically occur quickly and without formal recordkeeping or payment of fees; as such, the overall size of the secondary market is unknown (Cook and Ludwig 1996; Cook and Ludwig 1996).

7. eTrace is a web-based firearms trace request system available to accredited domestic and international law enforcement agencies to assist in tracing firearms purchased in the United States. Through this interface, law enforcement can electronically submit firearms trace requests, monitor trace progress, get completed results, and query trace data. More than 5,600 law enforcement agencies are registered with eTrace (ATF 2015; Lisko and Arends 2015).

information. These studies have produced somewhat fragmented and at times inconsistent results on the sources of crime guns and the nature of the illicit gun market.

In one such study, Julius Wachtel assessed records for 5,002 firearms recovered by law enforcement agencies in the Los Angeles area between 1988 and 1995; 82 percent of the guns were recovered by the Los Angeles Police Department, and the remainder by law enforcement from Los Angeles County or nearby communities (1998). Of the recovered firearms, 6 percent had been reported stolen. The initial purchaser and the possessor at the time of recovery were fully identified for 1,599 of the 5,002 guns; in 14 percent of these instances, the gun was seized from the initial retail purchaser. Traces of the firearms recovered in the Los Angeles area were successful approximately half of the time: state records had data for 47 percent of handguns shipped to a California dealer, and the ATF National Tracing Center successfully identified the first retail dealer for the remaining 46 percent.[8] Similarly, a trace study conducted by Philip Cook and his colleagues reveals a 65.5 percent trace success rate for five years (2009 through 2013) of requests submitted to the ATF National Trace Center by the Chicago Police Department (CPD) (2015).[9] Interestingly, traces for nongang guns were slightly more successful than traces for gang-related guns.

Two of the trace studies focused on illicit gun trafficking markets (Moore 1981; Wachtel 1998). One examined the closed case files of thirteen street gun dealing (that is, dealing without a license) investigations between 1974 and 1976 and found the predominant source of street firearms dealers to be through purchases from licensed dealers and residential thefts (Moore 1981). The other reviewed case studies of domestic gun trafficking investigations conducted by the ATF in Los Angeles between 1992 and 1995 (Wachtel 1998).[10] Three-quarters of the trafficked guns (n=14,328) were initially purchased at wholesale, either by licensed dealers (90 percent) or by unlicensed street vendors using a forged license (10 percent). Fourteen percent of the trafficked guns were initially purchased from retail dealers, nearly half (42 percent) by straw purchasers. Unlike Mark Moore, Wachtel finds no instances of residential theft (Moore 1981; Wachtel 1998).

In addition to yielding inconsistent findings at times, trace studies also have inherent bias. These studies rely on police submitting guns to be traced, which occurs only in a particular set of cases—presumably those believed to be important, and those that they may not be able to solve using other means (Cook and Braga 2001). Results from guns submitted to be traced may therefore be biased to reflect more serious, complicated cases, rather than a more representative cross-section of violent gun crime.

Trace studies are also criticized by some for failing to be geographically representative (Braga et al. 2002). However, few efforts have been made to capture these trends at a national level. For example, in 2010 Mayors Against Illegal Guns assessed national trace statistics for 2009. Overall, 238,107 guns recovered at crime scenes in the United States were submitted for tracing to the ATF National Tracing Center, of which 145,321 (61 percent) were successfully traced to a source state. The firearm was recovered in the same state in which it was initially purchased 70 percent of the time (n=102,067; Mayors Against Illegal Guns 2010). Another national study reports the most prolific traffickers to be corrupt federal firearms licensees (FFLs), which made up 9 percent of ATF investigations but nearly half of the guns accounted for (ATF 2000a). Conversely, although straw purchases made up nearly half of ATF investigations, they yielded few trafficked guns per investigation. Firearms stolen from manufacturers, licensed retailers, resi-

8. A noteworthy obstacle to these traces was that dealers failed to supply sales or disposition information for 40 percent (n=765) of guns traced to their location.

9. The guns submitted for traces were recovered between January 1, 2009, and September 17, 2013, from individuals younger than forty at the time of the recovery (Cook et al. 2015).

10. These investigations either led to a conviction or were still proceeding through the courts at the time of the study.

dences, and shipping carriers accounted for more than one-quarter of investigations (ATF 2000a). Given the moderate success rate of trace requests and the restrictions to generalizability, supplemental methods have been used for gun market research, most notably surveys or interviews with offenders.

Gun Offender Survey and Interview Studies

Studies using trace data can provide information on some elements of gun markets, but are unlikely to offer much insight into the largely undocumented secondary and illegal markets. Instead, interviews or surveys with arrested or convicted gun offenders can provide additional information about how crime guns are typically acquired. These studies range in generalizability, some focusing on specific jurisdictions or offender groups (for example, gang affiliated or juveniles), and others, such as the Survey of Inmates in Local Jails (SILJ) and Survey of Inmates in State Correctional Facilities (SISCF), nationally representative of persons held in state prisons and local jails (Cook et al. 2015). However, gaining offender cooperation in discussing illegal transactions may have prevented full participation or candor in some of these studies. A description of findings elicited from offender surveys and interviews with regard to crime gun sources is presented in table 1, though it is not an exhaustive review:

As with the trace studies, findings regarding illicit gun markets and acquisition of crime guns are also mixed when offenders are interviewed or surveyed. However, the most common source of firearms across most of the surveys was family and friends (Beck et al. 1993; Cook et al. 2007; Sheley and Wright 1993).

In general, adding interview research has provided a much richer picture of offender gun acquisition processes than trace-based studies alone. For example, a 1992 study of one hundred imprisoned "armed career criminals" found five primary sources for the offenders' guns, most of which were in secondary or illegal markets. These sources included private parties (off-the-street sales), involvement with criminal acts or associates, retail firearms, flea markets or gun shows, and relatives (ATF 1992). More recently, Cook and colleagues (2007) interviewed gang members, gun dealers, professional thieves, prostitutes, police, public school security guards, and teenagers in Chicago, and supplemented their findings with data from government surveys of recent arrestees in twenty-two cities, and administrative data. Using a mixed-method approach, they conclude that the underground gun market in Chicago is relatively thin, potentially because of gang monopolies in certain markets or activities, the police, or neighborhood-specific factors. Additionally, they reveal trends in acquisition and time to crime relevant to neighborhood crime rates. Contrary to research focused on more organized trafficking, Philip Cook and his colleagues (2007) and Daniel Webster and his colleagues (2002) find straw purchasing to be rare among juveniles in Chicago and Maryland, respectively, juveniles rarely leaving their communities to get guns.

Implications

Despite numerous legislative and administrative barriers to conducting a thorough assessment of crime gun markets, room for improvement on current methods remains. For example, the majority of the trace studies are limited to individual municipalities, which are more often than not in high regulation states such as California, New York, and Massachusetts (Moore 1981; Wachtel 1998). Similar studies are lacking for areas with weaker gun regulations, such as some states in the southern and midwestern United States. Additionally, inmate surveys are typically conducted independently of trace studies, rather than in the same jurisdiction. By applying both methodologies to the same jurisdiction, we can gain a deeper understanding of the supply chain of crime guns, from the initial purchase, identified through a trace, to the offenders' point of acquisition, as uncovered through the prisoner interviews. This study joins these two methods and addresses some of the gaps in the research discussed.

DESCRIPTION OF TRACE DATA

This study takes a multimethod approach to explore the supply chain of guns used in crimes from first legal sale to recovery by law enforcement following use in a crime. Two forms of data are used, as mentioned: trace results of

Table 1. Summary of Prior Crime Gun Source Research

Authors	Year	Method	Firearm Source
Wright et al.	1983	Interviewed imprisoned felons	50 percent borrowed or bought from friends 32 percent theft 16 percent bought from store
Wright and Rossi	1986	Survey of criminals about last handgun	43 percent purchased (FFL or pawnshop) 32 percent stole 9 percent borrowed 7 percent traded 8 percent received as a gift
Beck et al.	1993	Interviewed imprisoned felons	31 percent from family/friends 28 percent black market, drug dealer, fence[a] 27 percent purchased from store 9 percent theft
Sheley and Wright	1993	Interviewed delinquents and inner city youths (incarcerated and in high school)	30 percent from friends 22 percent on the street 21 percent drug dealer or addict 12 percent theft 7 percent bought at store 6 percent family members
Decker and Pennell	1995	Interviewed arrestees	45 percent illegal firearms market 13 percent theft
Survey of Inmates in Local Jails (SILJ)	2002	Surveyed individuals who used or possessed a gun when the offense occurred	45 percent friends and family 24 percent fence, street, drug dealer 19 percent gun store or pawn shop 7 percent other
Survey of Inmates in State Correctional Facilities (SISCF)	2004	Surveyed males eighteen to forty in first two years of prison term and admit they had a gun at time of crime	37 percent friends and family 31 percent fence, street, drug dealer 10 percent gun store/pawn shop 8 percent other
Cook et al.	2007	Interviews with nongang affiliated youths	40 percent relative 33 percent someone affiliated with a gang 17 percent licensed security guard 6 percent broker 2 percent other
Cook and Goss	2014	National survey of prisoners serving less than two years	41 percent friends and family 32 percent illegal or street 12 percent retail 14 percent other

Source: Authors' tabulation based on Wachtel (1998, 222) and Cook et al. (2015, app. A).
[a] "Fence" refers to businessmen who deal in large quantities of goods, often stolen from trucks or warehouses.

Table 2. Jurisdictional Characteristics

	Prince George's County	New Orleans	Chicago
Firearm suicides/suicides, 2011[a]	0.6	0.6	0.3
Population, 2010[b]	863,420.0	343,829.0	2,695,598.0
Number of sworn police officers, 2010[c]	1,562.0	1,452.0	12,515.0
Population/number of sworn police officers, 2010	552.8	236.8	215.4
Estimated police budget, number sworn officers, 2010[d]	159,169.3	90,448.1	97,642.5
Number of part 1 index crimes, 2010[c]	33,162.0	15,000.0	56,591.0
Number of index crimes, number sworn officers, 2010	21.2	10.3	4.5
Proportion of violent index crimes involving a gun[e]	0.5	0.4	0.4
Percentage of white population, 2010[b]	19.2	33.0	45.0
Percentage of black population, 2010[b]	64.5	60.2	32.9
Percentage of Hispanic population, 2010[b]	14.9	5.2	28.9
Percentage of foreign population, 2010[b]	20.7	6.0	20.9

Source: Authors' calculations.

[a] CDC 2016.

[b] U.S. Census Bureau 2010.

[c] FBI 2011.

[d] Estimated by taking the average of the 2007 and 2013 values from Law Enforcement Management and Administrative Statistics (LEMAS), U.S. Department of Justice.

[e] Police departments and UCR.

guns used in violent crimes and submitted by local police agencies for tracing; and observations and opinions of incarcerated individuals on the nature of gun markets in the jurisdiction of their offense. These sources provide insight into when and where crime guns were first purchased, how they were acquired by violent offenders, and when they were recovered by law enforcement.[11] These data were collected from three diverse jurisdictions, selected to reflect differences in population characteristics, crime, gun enforcement, and the regulation of gun sales and transfers.

Jurisdictions

The three jurisdictions sampled are New Orleans, Louisiana, Chicago, Illinois, and Prince George's County, Maryland. In selecting these sites, we sought jurisdictions in states that were markedly different in the degree to which their laws and regulations monitor and control gun sales and possession. Although this study does not test the impact of these differences, the results from the analysis presented here may be helpful in identifying additional research necessary to better understand the relationship between regulations and crime gun acquisition. Reviews by independent oversight and advocacy organizations highlight the legislative and regulatory differences between the three jurisdictions. For example, the Law Center to Prevent Gun Violence issues an annual scorecard, which in 2014 gave the state of Maryland a grade of A- (the highest grade given), Illinois a B+, and Louisiana an F (2014).

In addition to regulatory disparities, these

11. In the firearms literature the time between first legal sale and tracing is referred to as *time to crime*. This time is typically found to be between five and seven years. This article references it as *time to recovery* because the weapon could have been used in crimes before the one in which it was recovered. Even with trace data and inmate interviews it remains unclear how and when the weapon moved from the initial legal owner to the person who uses it in a crime (when that offender is not also the original purchaser). In New Orleans and Prince George's County, we are seeking to better understand this period by interviewing first legal purchasers; these results will be reported in later work.

jurisdictions differ in other ways that may affect gun markets (table 2). For example, in 2010, the 1,452 sworn police officers of the New Orleans Police Department (NOPD) served the entire city of New Orleans, which has a population of roughly 344,000 (FBI 2011; U.S. Census 2010). During this period, the officers responded to approximately fifteen thousand Part I index crimes. In 2011 and 2012, 40 percent of violent index crimes involved a gun, including 70 percent of homicides, 50 percent of robberies, and 30 percent of aggravated assaults.[12] Unfortunately, no reliable data are available on variation in gun prevalence across U.S. regions. A common proxy that correlates highly with survey-based estimates of gun prevalence is the proportion of suicides committed with a firearm (Azrael, Cook, and Miller 2004). Using this measure obtained from the Centers for Disease Control and Prevention (CDC) Underlying Cause of Death Database, we find that more than 60 percent of completed suicides in New Orleans were committed with a firearm.

The New Orleans gun crime landscape is measurably different from Prince George's County, Maryland, which claims a population of 863,420 and is policed by approximately 1,562 sworn officers who responded to just over thirty-three thousand Part I index crimes in 2010 (FBI 2011; U.S. Census 2010). The Prince George's Police Department (PGPD) quantifies crime data using a different metric than the standard FBI Uniform Crime Report (UCR) measures; specifically, publicly available PGPD crime data quantify gun crime differently than NOPD and do not include a count of robbery incidents. To aid in cross-jurisdictional comparisons, this study uses UCR crime numbers for Prince George's County. To best estimate the number of gun crimes that occurred, the proportion of crimes that involved a gun (based on numbers provided by PGPD) was multiplied by UCR crime incidents.

Additionally, because estimates of the number or proportion of robberies committed with a firearm between 2012 and 2013 were unavailable, the proportion of robberies in which a firearm was used in Maryland in 2012 was exploited to estimate this number (FBI 2013, table 21). The proportion of violent crimes involving a firearm in Prince George's County is somewhat consistent with New Orleans, in that approximately 51 percent of violent index crimes involved a firearm, including 74 percent of homicides, 43 percent of robberies, and 55 percent of aggravated assaults. In Prince George's County in 2011, 58 percent of completed suicides were committed with a firearm.

Last, Chicago greatly differs from the other two locations, boasting a population of nearly 2.7 million residents and the nation's second largest police force, of more than 12,500 sworn officers as of 2010 (FBI 2011; U.S. Census 2010). From 2011 to 2013, this department responded to well over fifty-six thousand violent Part I index crimes, of which 39 percent involved a firearm, including 85 percent of homicides, 64 percent of robberies, and 20 percent of aggravated assaults. Chicago has an estimated lower level of gun prevalence because only around 30 percent of suicides are committed with a firearm, which is about half the proportion in New Orleans and Prince George's County.

The demographics of the three locations also differed in 2010: Chicago had a larger white population (45 percent) than New Orleans (33 percent) and Prince George's County (19 percent), a smaller African American population (33 percent) than New Orleans (60 percent) and Prince George's County (65 percent), and a larger Hispanic population (29 percent) than both New Orleans (5 percent) and Prince George's County (15 percent). New Orleans had a much smaller foreign-born population (6 percent) than Chicago and Prince George's County (20.9 percent and 20.7 percent, respectively) (U.S. Census 2010). The jurisdictions were similar in terms of other demographics, such as sex and age composition. We did not control for those differences because this descriptive analysis seeks to explore and document—rather than explain—differences.

Based on these conditions, we hypothesized the following from differences in police presence, density of gun ownership, demo-

12. These gun crime statistics were obtained through personal communication with the New Orleans Police Department.

graphics and other factors. We cannot test these factors within the purview of this research, but their consideration may inform future research. Consistent with research, we expected that in low regulation states guns were more likely to be purchased in-state. Additionally, the increased density of firearm ownership in New Orleans and Prince George's County over Chicago may make acquisition from social connections or theft a more certain avenue for obtaining a gun simply because more individuals are likely to possess one. On the other hand, more lax gun regulations may make gun store purchases more attractive to individuals in New Orleans. In Chicago, we might expect fewer individuals to purchase guns from a gun store given the availability of guns either trafficked from or purchased in Indiana, a low regulation state bordering the city. In Prince George's County, it is possible, given relatively stringent gun regulations and a proximate source state in Virginia, that individuals may behave similarly with regard to reliance on connections or the illegal market as sources of firearms. With currently available data, we cannot, of course, test any of these hypotheses but they are useful context for future research.

Trace Data

We received the trace results for all guns submitted by the NOPD, PGPD, and CPD to the ATF for tracing over a two-to-three-year period.[13] The guns submitted for tracing include those used during the commission of crimes as well as those recovered by police but not directly used in a crime (for example, taken from a person, found in public places, confiscated during investigation for other crimes, and the like). Not all guns submitted by these jurisdictions were successfully traced, which could be due to missing records, obliterated serial numbers, or the age of the gun. In short, although the trace data are the only source against which to identify the original purchaser of each gun recovered, they do not cover all crime guns and are not available for all recovered guns. As part of our results, we analyze a random sample of gun crime police reports from one jurisdiction where a firearm was either recovered or not recovered to better understand the selection process leading to the recovery of a firearm following a gun crime. To our knowledge, this is the first attempt to empirically understand the differences in distribution of guns between instances when one is recovered from a possessor and one is not.

Firearms were recovered in about one-quarter of the violent gun crimes that occurred in New Orleans between 2011 and 2012. The crime codes used in Chicago appear to reflect the police practice of targeting firearms for recovery; this difference may account for that between Chicago and the other two jurisdictions.[14] It appears that those tasked with completing eTrace requests may use broader categories to populate this field rather than specifying the exact crime type the recovered firearm was associated with. Thus these values are underestimated to an unknown extent. Again, it is difficult to know exactly how many guns were recovered in Prince George's County, given the way PGPD calculates gun crimes. Using the UCR estimate described earlier, however, only 11 percent of violent gun crimes resulted in a recovered firearm. Despite the limitations of disaggregating the proportion of recovered guns by crime type in Chicago and Prince George's County, each jurisdiction shows that guns were most likely to be recovered in homicides, followed by aggravated assaults, whereas they were unlikely to be recovered in armed robberies.

The trace data used in this report concern

13. Although the data come from the same source, variation is entirely possible in how fields are entered, coded, and maintained across the jurisdictions. This demands caution when attempting to draw comparisons across jurisdictions.

14. The crime codes Firearm under Investigation (n=8,281, 44.9 percent) and Possession of Weapon (n=4,043, 21.3 percent) make up a disproportionate number of records relative to their corresponding arrest incidents in other jurisdictions but tie with Chicago for weapons offenses. We note the volume of police stops during our study time period as a possible factor in the large volume of weapon charges. For more information, see "Stop and Frisk in Chicago," http://www.aclu-il.org/sites/default/files/wp-content/uploads/2015/03/ACLU_StopandFrisk_6.pdf (accessed October 1, 2017).

only recovered firearms that were submitted to the ATF. It is possible, and in fact likely, that crimes in which a gun is recovered differ from those in which one is not. To estimate the potential differences between these conditions, we used a random selection of NOPD police reports from 2011 and 2012 to compare crimes in which a gun was recovered and crimes in which a gun was used but never recovered (table 3).[15] The incidents in which a firearm was recovered were more likely to result in an arrest and more likely to kill or injure the victim than when a gun was not recovered. Differences in victim and offender characteristics were also discernable.

As mentioned, not all recovered guns submitted to the ATF were successfully traced.[16] The proportion of successful traces varied across jurisdictions, New Orleans showing greater success (74.0 percent) than either Chicago (60.9 percent) or Prince George's County (63.2 percent) (tables 4 and A6). Traces were unsuccessful for several reasons, the most common of which bieng quite similar across jurisdictions: age of the gun; a missing, invalid, or obliterated serial number; the dealer or manufacturer being out of business or deceased; and an FFL not having the necessary paperwork available. We cannot adjust our results for these differences, but they should be kept in mind while interpreting any analyses of trace data. Too often these data are interpreted as if they were more complete measures of original sources of crime guns.[17]

RESULTS OF TRACE ANALYSES

Using trace data from New Orleans, Prince George's County, and Chicago, we explored patterns related to source states (where the gun was acquired by the first purchaser), crime type, time to recovery, FFL concentrations, and purchaser and possessor demographics.[18] Because trace data do not represent a random or systematic sample of firearms from a jurisdiction, but instead reflect police practices, recordkeeping, and other factors, we analyzed select subsets of recovered crime guns, purchasers, or possessors. For example, we assessed four crime types associated with the recovered crime guns (violent, property, weapon, and drug), expecting recovered firearms associated with violent arrestees to be associated

15. Although we initially conducted a multivariate logistic regression, interpreting the results was ineffectual due to small cell sizes for some variables and differences in the distribution of available information between recovered and unrecovered gun crimes (for example, no aggravated assaults were reported for gun crimes when a firearm was not recovered). For these reasons, we rely on the descriptive table to display how these gun crimes differ.

16. Based on conversations with ATF personnel at the National Tracing Center, we define a successful trace as one that produces the full name and date of birth of the first legal purchaser.

17. In addition, the ATF does not attempt to ensure the accuracy and completeness of information submitted by agencies seeking trace requests. Although this may not matter for the operational use of trace results for specific cases, it does matter for the use of trace results for strategic and research purposes.

18. ATF trace data are generated to inform law enforcement investigations, not academic research. It thus appears that information is not always entered uniformly in eTrace (such as whether to populate optional fields), resulting in varying amounts of missing data across jurisdictions. To accommodate this factor, and to be as inclusive as possible without sacrificing accuracy, we provide the number of cases resulting from varying restrictions to our denominator in table A1. Throughout this manuscript we make comparisons using all successful traces as our denominator, but it is important to remember that the jurisdictions vary in the amount of missing cases due both to an unsuccessful trace and local data maintenance practices. Researchers must be careful when using a data source that is so incomplete, where the correlates of incompleteness are not well understood, and when the source does not conduct appropriate error checks. The fact that our review of trace results across jurisdictions found similar results in terms of levels of tracing and reasons for unsuccessful traces should not be taken as a demonstration of the accuracy or representativeness of the trace data. Rather, our comparison of trace results for recovered and unrecovered guns, combined with the small percentage of guns that are recovered in each jurisdiction supports the call for stronger, more comprehensive data sources for crime gun research (see, for example, Wellford, Pepper, and Petrie 2005). We expand on this issue in our conclusion.

Table 3. Gun Recovery in New Orleans, 2011–2012

	Gun Recovered (N=202) n, percentage	No Gun Recovered (N=250) n, percentage
Crime type		
Aggravated battery	53, 26.2	72, 28.8
Armed robbery**	27, 13.4	141, 56.4
Homicide**	60, 29.7	36, 14.4
Aggravated assault**	55, 27.2	0
Negligent injury**	6, 3.0	0
Illegal carry weapon	1, 0.5	0
Fraudulent report	0	1, 0.4
Status		
Open**	75, 37.1	182, 72.8
Cleared by arrest**	121, 59.9	65, 26.0
Time of crime		
12:01–4:00 am*	29, 14.4	51, 20.4
4:01–8:00 am	11, 5.5	20, 8.0
8:01–12:00 pm	21, 10.4	18, 7.2
12:01–4:00 pm	31, 15.4	31, 12.4
4:01–8:00 pm	51, 25.3	47, 18.8
8:01–12:00 am*	59, 29.2	83, 33.2
Offender race		
Black**	138, 89.0	198, 98.5
White**	12, 7.7	2, 1.0
Hispanic**	4, 2.6	0
Other	1, 0.7	1, 0.0
Offender sex		
Male**	137, 87.8	198, 98.5
Female**	19, 12.2	3, 1.5
Offender under twenty-four		
Yes**	50, 38.8	40, 61.5
No**	79, 61.2	25, 38.5
Number of offenders		
One offender*	110, 67.5	127, 57.7
Multiple offenders*	53, 32.5	93, 42.3
Victim race		
Black**	164, 82.4	178, 72.0
White**	24, 12.1	47, 19.0
Hispanic	10, 5.0	17, 6.9
Other	1, 0.5	5, 2.0
Victim sex		
Male	152, 76.4	198, 79.8
Female	47, 23.6	50, 20.2

Table 3. (*continued*)

	Gun Recovered (N=202) n, percentage	No Gun Recovered (N=250) n, percentage
Victim under twenty-four		
Yes	48, 27.7	62, 26.2
No	125, 72.3	175, 73.8
Victim injury		
No injury**	72, 36.0	122, 49.0
Minimum injury	8, 4.0	12, 4.8
Treat and discharge	4, 2.0	10, 4.0
Hospitalized	58, 29.0	72, 28.9
Death**	58, 29.0	33, 13.3

Source: Authors' calculations.
*$p < .1$, two-tailed proportional z-test
**$p < .05$, two-tailed proportional z-test

Table 4. Trace Information

Jurisdiction	Number of Recovered	Number of Successful Traces	Top Four Reasons for Unsuccessful Trace
New Orleans, 2011–2012	3,068	2,269	1. Retail or manufacturer dealer out of business or died (N=183; 26.4 percent) 2. Serial number missing, invalid, or obliterated (N=135; 19.5 percent) 3. Gun sold before recordkeeping requirements (N=99; 14.3 percent) 4. FFL paperwork unavailable (N=96; 13.9 percent)
Chicago, 2011–2013	18,455	11,248	1. Gun sold before recordkeeping requirements (N=1,978; 30.5 percent) 2. Retail or manufacturer dealer out of business or died (N=1,287; 19.8 percent) 3. FFL paperwork unavailable (N=787; 12.1 percent) 4. Serial number missing, invalid, or obliterated (N=683; 10.5 percent)
Prince George's County, 2011–2013	2,034	1,286	1. Gun sold before recordkeeping requirements (N=169; 26.5 percent) 2. Retail or manufacturer dealer out of business or died (N=154; 24.1 percent) 3. Serial number missing, invalid, or obliterated (N=100; 15.7 percent) 4. Information missing from trace request (N=67; 10.5 percent)

Source: Authors' calculations.

Table 5. Source Location of All Guns and New Guns with Short TTR

	All Guns Recovered		Guns with TTR < Two Years	
	In State	Out of State	In State	Out of State
New Orleans, 2011–2012	77.2	22.8	86.3	13.7
Chicago, 2011–2013	42.2	57.8	57.5	42.5
Prince George's County, 2012–2013	47.1	52.9	62.9	37.2

Source: Authors' calculations.
Note: Percentages were calculated using denominator 3 from table A6.

with indicators of gun trafficking or problematic firearms purchases at the highest rate. Consistent with prior research, we treated cases in which a female purchased a pistol or revolver recovered in the possession of a male as a possible indicator of a straw purchase (see Cook et al. 2015).[19] Although a 2000 ATF report on criminal investigations involving firearm traffickers indicated that this classification scheme represented only 18 percent of straw purchases, following friends (45 percent) and relatives (23 percent), it was the only category readily measurable with our trace data (ATF 2000a). We recognize that this is only one possible subset of straw purchasers, and note that the measurement of straw purchasing is in need of development.[20]

Sources of Firearms

We first examined the relative importance of different state sources in supplying firearms to our jurisdictions of interest. Firearms first purchased in a different state than where it was recovered are a potential indicator of interstate trafficking, whereby prohibited purchasers or associates may take advantage of varying state regulations to obtain firearms. We compared the proportion of firearms first purchased in the state in which they were recovered to those purchased out of state to examine the impact of neighboring state regulations on crime guns recovered in our jurisdictions of interest. We would expect based on the relatively lax regulatory environment in Louisiana, that guns recovered in New Orleans would be more likely to have been initially purchased within the same state than those recovered in Prince George's County and Chicago (given that both Maryland and Illinois have stricter laws and are bordered by states with lower regulation scores). In addition, these differences may be even greater for firearms recovered within two years of their first legal sale. We assessed the proportions of successfully traced crime guns purchased in state rather than out of state across the jurisdictions (see table 5); the results show that the proportion of successfully traced guns first purchased by individuals residing out of state in which the gun was eventually recovered is lower for New Orleans than for Chicago or Prince George's County. These findings are consistent when the firearms are restricted to guns recovered within two years of first purchase. Despite differences in source states that conformed to our expectations based on jurisdictional gun regulations, with a sample of only three jurisdictions and an inability to control for confounding factors, we are unable to attribute this difference to these regulations. However, our findings do align with a study that included a larger sample of cities and controlled for multiple confounding factors (Webster, Vernick, and Hepburn 2001). They also align with studies analyzing the effect of Virginia's one-handgun-per-month law on interstate trafficking (Braga 2017; Weil and Knox 1996).

When broken out by type of crime, firearms

19. Because the sex of the possessor was not available in the New Orleans trace data, and we wanted to be consistent across datasets, we estimated the sex of the purchasers and possessors using the gender package in R statistical software (https://cran.r-project.org/web/packages/gender/gender.pdf, accessed October 1, 2017).

20. Table A1 provides alternate straw purchase estimates using an array of definitions, which might be of value in future work.

Table 6. Source Locations of Successfully Traced Firearms

	In State	Out of State	Total
Violent crime			
New Orleans, 2011–2012	80.4	19.6	100, n=393
Chicago, 2011–2013	44.9	55.1	100, n=675
Prince George's County, 2012–2013	44.1	55.9	100, n=247
Property crime			
New Orleans, 2011–2012	82.8	17.2	100, n=87
Chicago, 2011–2013	68.8	31.3	100, n=48
Prince George's County, 2012–2013	53.7	46.3	100, n=54
Weapon crime			
New Orleans, 2011–2012	76.3	23.7	100, n=801
Chicago, 2011–2013	38.9	61.1	100, 9,111
Prince George's County, 2012–2013	39.5	60.5	100, n=380
Drug crime			
New Orleans, 2011–2012	79.9	20.2	100, n=546
Chicago, 2011–2013	41.5	58.5	100, n=357
Prince George's County, 2012–2013	41.0	59.0	100, n=188
Other crime			
New Orleans, 2011–2012	71.6	28.4	100, n=423
Chicago, 2011–2013	42.2	57.8	100, n=809
Prince George's County, 2012–2013	58.0	42.0	100, n=405
Overall			
New Orleans, 2011–2012	77.3	22.8	100, n=2,250
Chicago, 2011–2013	39.7	60.3	100, n=11,000
Prince George's County, 2012–2013	47.1	52.9	100, n=1,274

Source: Authors' calculations.
Note: Percentages were calculated using denominator 3 from table A6.

recovered during property crimes are more likely to originate within the state where they are recovered than out of state across all three jurisdictions (table 6). However, for the other crime types assessed (violent, weapon, drug, and "other"), the relative frequency of guns originating within or outside of the recovery state varies according to jurisdiction.[21] Furthermore, in the low regulation jurisdiction, weapons recovered in all crime types are largely from in-state purchases.[22] Again, despite being consistent with our hypotheses, other unmeasured explanations could explain this pattern.

Age of Recovered Firearms

We next examined the amount of time between first purchase and recovery, which the ATF uses as an indicator of gun trafficking (with a shorter time to recovery associated with a higher likelihood that a gun was traf-

21. The "other" crime category includes the remaining NCIC crime types, such as found firearms, traffic offenses, and public order offenses.

22. Prior research has noted that changes in regulations, specifically the background checks mandated under the Brady Act, have affected out-of-state gun recoveries in Chicago (Cook and Braga 2001). We replicated this analysis for our jurisdictions' recovered firearms (results available on request). Over time, firearms purchased from FFLs in-state make up a greater proportion of all recovered firearms in all three jurisdictions.

Table 7. Time to Recovery by First Purchaser Location and Crime Type

	In State	Out of State	Total
Violent crime			
New Orleans, 2011–2012	7.4	11.9	391
Chicago, 2011–2013	10.1	13.8	675
Prince George's County, 2012–2013	10.6	13.8	246
Property crime			
New Orleans, 2011–2012	5.5	7.3	87
Chicago, 2011–2013	13.0	19.6	48
Prince George's County, 2012–2013	9.2	9.6	54
Weapon crime			
New Orleans, 2011–2012	7.1	8.2	801
Chicago, 2011–2013	11.9	14.4	9,111
Prince George's County, 2012–2013	9.0	12.4	380
Drug crime			
New Orleans, 2011–2012	6.7	11.0	546
Chicago, 2011–2013	12.6	15.4	357
Prince George's County, 2012–2013	9.2	15.5	188
Other crime			
New Orleans, 2011–2012	9.0	10.9	422
Chicago, 2011–2013	11.7	14.4	809
Prince George's County, 2012–2013	9.0	14.8	405
Overall			
New Orleans, 2011–2012	7.3	9.9	2,247
Chicago, 2011–2013	11.7	14.5	11,000
Prince George's County, 2012–2013	9.3	13.7	1,273

Source: Authors' calculations.

Note: Percentages were calculated using denominator 3 from table A6.

ficked). We expected to see fewer years between first legal sale and recovery by law enforcement in New Orleans compared to Chicago or Prince George's County, because, among other factors, the less restrictive gun regulations should allow offenders to gain access to newer guns more easily. As expected, the average time to recovery for successfully traced firearms was lowest in New Orleans, followed by Prince George's County and then Chicago, and was uniformly lower for purchases within the state than for outside of the state (table 7). These findings appear to hold across crime types. Along with differences in gun regulations, the variation in the age of recovered crime guns could be due to numerous other factors, such as the prevalence of gangs across the cities, though some research suggests that gang members have a different relationship to gun use and possession than nongang members do and that their guns may be older (on the relationship, Braga 2017; on gun age, Cook et al. 2015).

First Purchaser Characteristics

To understand differences among first purchasers who either consciously or inadvertently divert guns from the legal market, we divided our purchasers into several groups: female purchasers whose pistols or revolvers were recovered in the possession of a male, same purchaser-possessor, and multiple fire-

Table 8. Purchaser Characteristics Representing Potentially Problematic Buyers

	New Orleans (2011–2012)	Chicago (2011–2013)	Prince George's County (2012–2013)
Straw purchasers[a]			
Percent	14.2	12.1	10.5
n	208	861	85
Total	1,461	7,095	813
Same purchaser possessors[b]			
Percent	19.7	15.3	27.1
n	327	1,219	242
Total	1,660	7,978	894
Multiple firearm purchasers[c]			
Percent	5.4	6.8	4.6
n	122	769	59
Total	2,269	11,248	1,286

Source: Authors' calculations.
[a] Percentages were calculated using denominator 5 from table A6.
[b] Percentages were calculated using denominator 4 from table A6.
[c] Percentages were calculated using denominator 2 from table A6.

arm purchasers.[23] These transaction types do not represent the majority of the guns recovered but are potentially informative (table 8). For example, females are less likely to have a criminal history and are more likely to be successful in purchasing a firearm legally from an FFL; when their purchased guns are recovered in possession of a male, it is therefore possible that the purchase was made on behalf of a prohibited male associate.[24] As this is likely to be especially true for pistols and revolvers, we condition our estimates on this weapon type. Cases in which the first purchaser is also the possessor at time of recovery may disproportionately represent the class of individuals who are not prohibited possessors and can legally purchase a firearm for potential misuse despite lacking a criminal record. Finally, the ATF considers multiple firearm purchases as an indicator of possible diversion into the illegal market and has instituted various programs and data collection priorities to track them.[25]

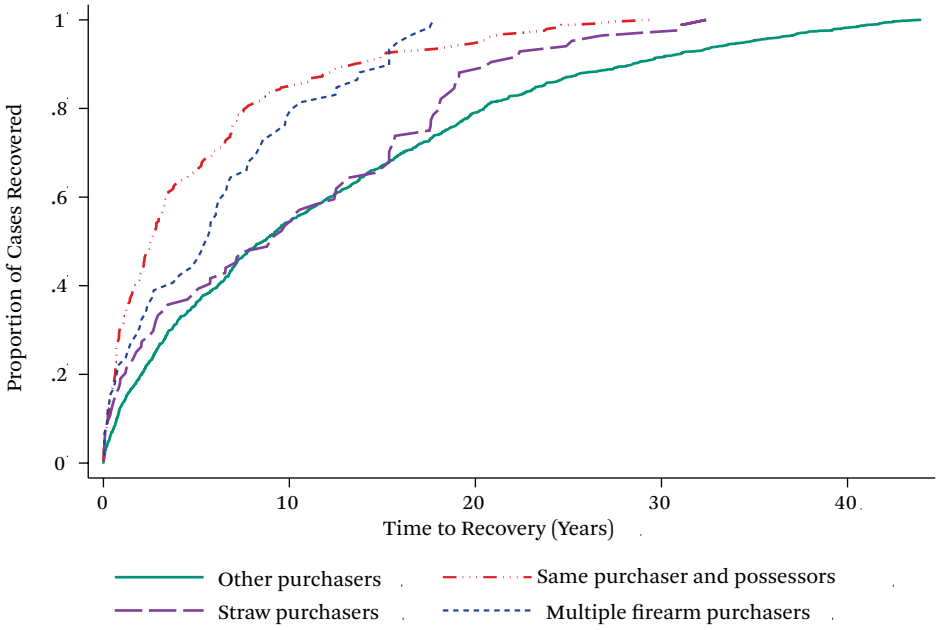
These categories are not mutually exclusive (a female first purchaser could also be the final possessor and purchase multiple handguns), but in New Orleans possible straw transactions make up 14.2 percent of all successfully traced crime guns, in Prince George's County 10.5 percent, and in Chicago 12.1 percent. The greater proportion of possible straw

23. We coded multiple firearm purchasers as the first purchasers of successfully traced firearms that were reported to the ATF by the FFL as being part of a multiple handgun sale. The ATF uses this code as an indicator of illegal diversion (ATF 2000b).

24. This definition of straw purchasers is drawn from Philip Cook and his colleagues (2015, 743). We realize that this definition of straw purchaser, though widely used in the firearms literature, is problematic. Obviously, not all female purchasers are straw purchasers, but given the available data this is the closest approximation we can get to measuring this type of purchaser. For that reason, we urge caution in drawing strong conclusions from this portion of our analysis.

25. The ATF cites multiple purchases as an indicator of firearms trafficking and tracks multiple purchases on the part of southern border states by requiring FFLs to report instances of multiple sales of rifles designated as semiautomatic (see ATF 2016).

Figure 1. New Orleans Purchaser Groups, 2011–2012



Source: Authors' tabulation.

purchases in the weakest gun regulatory area might suggest that straw purchasers perceive a greater willingness of dealers to sell to them, though we are unable to test this hypothesis with a sample of only three jurisdictions. To estimate the frequency of the same purchaser-possessor, we used a probability matching procedure to match fields with identical first name, last name, and date of birth and, as a result, may underestimate the same extent of same purchaser-possessor.[26] This purchase type is highest in Prince George's County. The mixed findings across jurisdictions make this purchaser type difficult to diagnose.

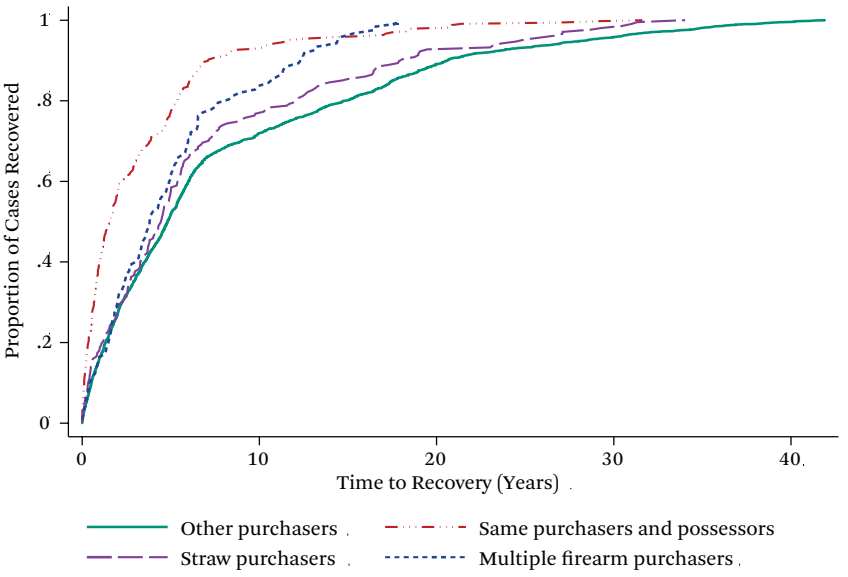
Next, we examined the average cumulative time to recovery across different purchaser groups (figures 1, 2, and 3). We hypothesized that if these purchaser types—straw purchasers, same purchaser-possessors, and multiple firearm purchasers—represent potentially dangerous or illicit buyers, then the firearm they purchased is more likely to be used in a crime and recovered by law enforcement relatively quickly. We find that in each jurisdiction, the firearms most quickly recovered from crimes are those associated with the same purchaser-possessor. The short time to recovery for this purchaser group seems to suggest that many of these individuals are purchasing the crime gun with the intent of using it. We also observe a steeper slope for the cumulative time to recovery of crime guns purchased as part of a multigun sale and by straw purchasers relative to other successfully traced purchasers. Again, although these purchaser types are only a proxy for straw purchasers or firearm diverters, the shorter time to recovery may indicate that the firearms are being turned over to individuals who intend to use them illegally. However, this claim is given some validity by the fact that multiple analyses from many other states have come to the same or similar conclusions using these proxies (Koper 2014; Pierce et al. 2004; Wright, Wintemute, and Webster 2010).

Federal Firearms Licensee Sources

Earlier we described jurisdictional differences in purchaser source states and time to recovery for recovered and successfully traced crime guns. To better understand where these guns

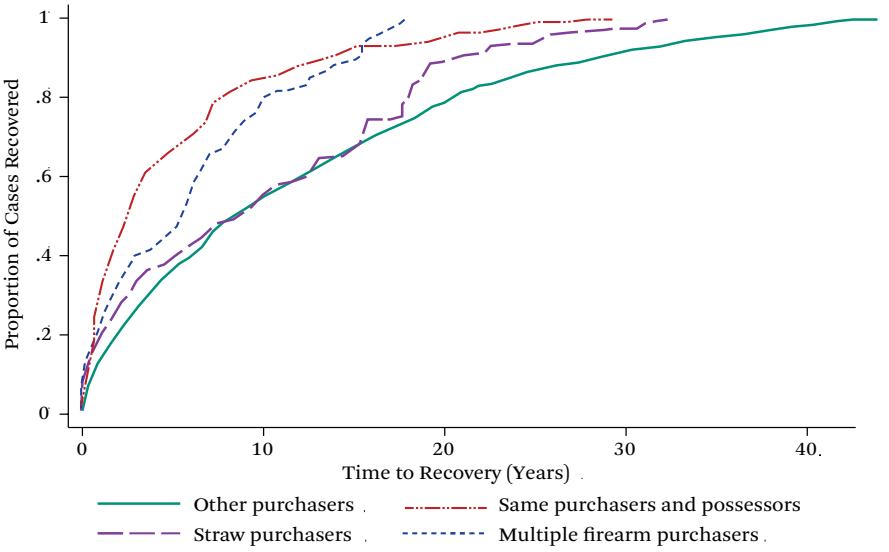
26. We used the STATA matchit command with a 75 percent probability threshold.

Figure 2. Chicago Purchaser Groups, 2011–2013



Source: Authors' tabulation.

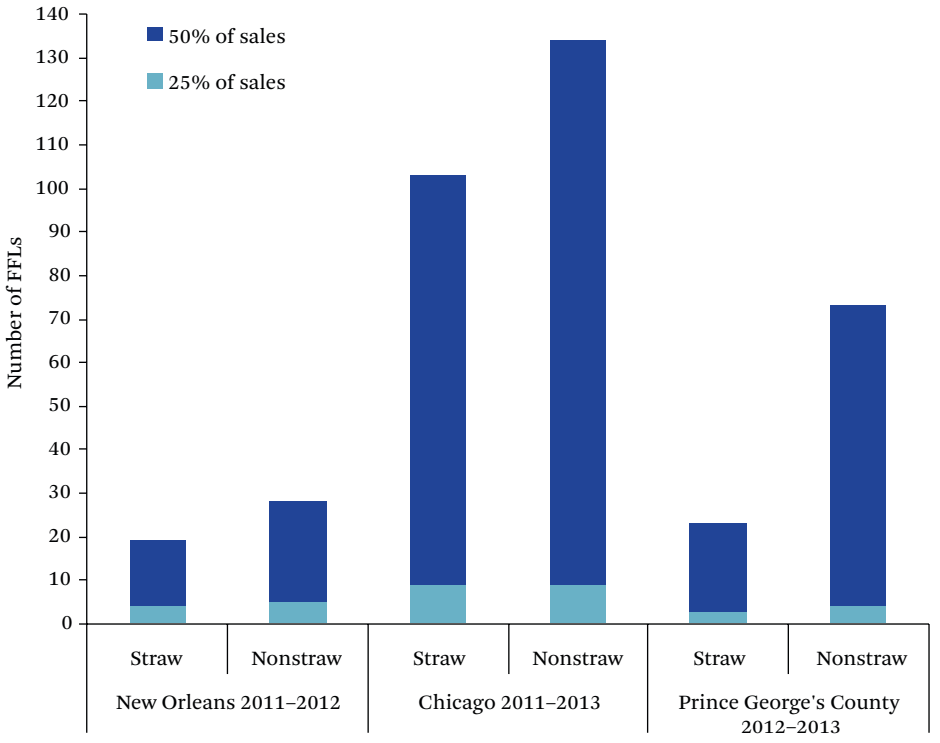
Figure 3. Prince George's County Purchaser Groups, 2012–2013



Source: Authors' tabulation.

are coming from and how they end up in offenders' hands, we examined differences in the concentration of FFLs used by the original purchasers, and probed whether straw purchasers, as we defined them, were more likely to shop at a certain few dealerships—"point sources"—than nonstraw purchasers (Cook and Braga 2001). Further, Garen Wintemute finds that FFLs with high rates of trace requests or denials were more likely to sell to women and were more likely to have attempted straw purchases within the past year than other FFLs in his multistate mail survey (2017). He also finds, in another study, that certain gun dealers in Califor-

Figure 4. Concentration of All Gun Sales Among FFL Dealers



Source: Authors' tabulation.

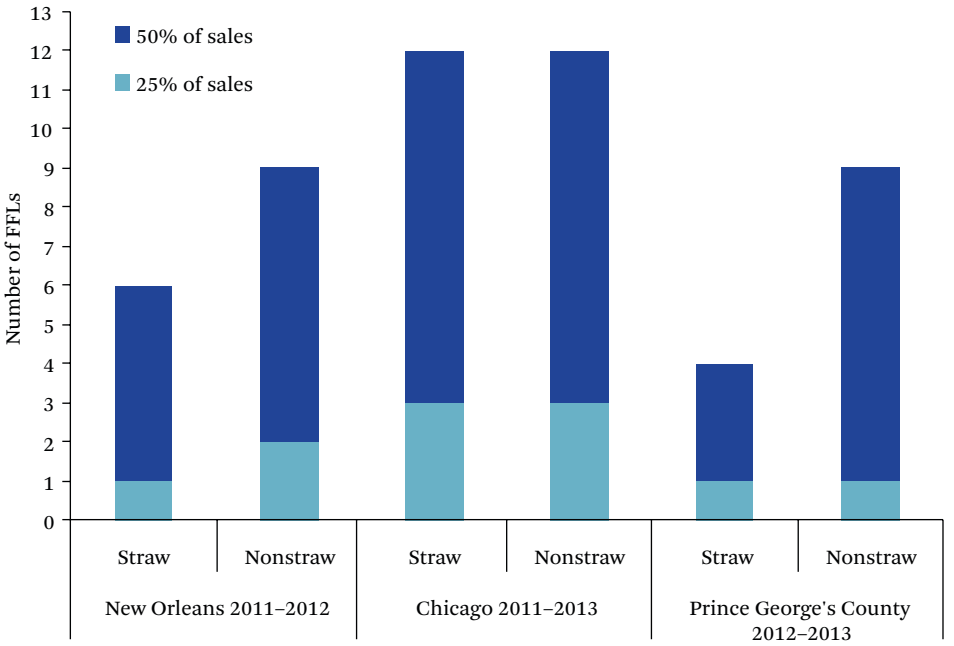
nia were more likely to agree to sell to an explicit straw purchaser, and that their likelihood depended on the FFLs' location within the state (2010).

We sought to examine whether this variability in sales, as measured by the number of sales to our straw purchaser proxy, varied between our three jurisdictions. To do so, we assessed the proportions of dealers accounting for 25 percent and 50 percent of pistol or revolver sales, conditional on sales to straw or nonstraw purchasers, for all recovered guns and guns recovered within two years of purchase (figures 4 and 5). These figures reveal that new, recovered crime guns come from relatively few dealers, and sales to possible straw purchasers appear to be concentrated among even fewer FFLs. For example, 50 percent of all new guns sold across the three jurisdictions came from only around ten dealers. We postulate that in jurisdictions with stricter gun regulations, it may be more difficult to find a dealer willing to supply firearms to potential straw purchasers, so these individuals may be more likely to frequent more 'liberal' gun dealers. Although the findings for New Orleans and Chicago are mixed, the difference in FFL concentration between straw and nonstraw purchasers is consistently highest in Prince George's County, indicating that straw purchasers especially concentrate their purchases to a few FFLs within this jurisdiction. Future research aimed at understanding why this is the case might provide useful information for reducing the movement of guns into the illegal market.

In summary, our analysis of successful firearms traces in three jurisdictions suggests that fewer than 25 percent of all crimes committed with a gun result in gun recovery, that serious crimes such as homicide yield the highest recovery rates across jurisdictions, and that crimes with recovered guns differ from crimes where guns are used but not recovered.

Of those recovered and submitted for tracing, approximately two-thirds are successfully

Figure 5. Concentration of New Gun Sales Among FFL Dealers



Source: Authors' tabulation.

traced. Common reasons for an unsuccessful trace across jurisdictions include the age of the gun and record-keeping requirements, difficulty obtaining records from manufacturers, dealers, and FFLs, and problems identifying the firearms' serial numbers.

In jurisdictions with fewer firearms regulations the proportion of guns purchased in the same state where they were recovered was considerably higher than in states with greater regulations; this was true for all crime types. Regardless, since 2000, recoveries of in-state purchases have been increasing across all three jurisdictions. Despite our inability to causally attribute this finding to jurisdictional differences in gun regulation, our descriptive findings are similar to those of other studies that examine a greater number of jurisdictions, include a larger number of confounders, and examine specific regulatory changes. Importantly, our findings remain descriptive.

No observed relationship is evident across our jurisdictions regarding the percent of cases where the first purchaser and the possessor at time of recovery are the same person. Approximately 15 percent of guns recovered and successfully traced involved the same purchaser and possessor.

Time to recovery was longer in jurisdictions with stricter gun regulations. Time to recovery was consistently shorter for cases with the same purchaser and possessor across jurisdictions. Again, although we do not attribute this finding solely to differences in gun regulation across the jurisdictions, our findings support previous research showing shorter time to recovery in different low regulation states.

Our proxy measure for straw purchasers provided results inconsistent with our expectations: the state with the lowest regulations had the highest proportion of individuals identified as possible straw purchasers.[27] Somewhat in line with our expectations was the finding that straw purchasing is concentrated to a

27. Data on state of purchase and residence are difficult to interpret without information on movement by purchasers and proximity to borders, both of which could result in assumption of out-of-state purchase that is incorrect. This applies to all analyses using state of purchaser, not just attempts to measure straw purchase.

greater extent among fewer FFLs (point sources) in Prince George's County than in New Orleans or Chicago. Future research will need to more accurately operationalize straw purchasers and parse out how much of these effects are due to gun regulations as opposed to other social or political causes.

INMATE SURVEY DATA

In each jurisdiction, we sought to determine how incarcerated individuals described how offenders acquired guns in their jurisdiction. In Louisiana, we used a random sample of 321 persons incarcerated in the state prison system for a crime of violence that they had committed in New Orleans between 2011 and 2012. These inmates were surveyed in groups of between eight and thirty-one, in seven different prisons. Responses were received from 220 (69 percent), almost all of the refusals coming at one maximum security prison in which survey conditions were very difficult. The instrument asked twelve questions about how guns were obtained, used, stored and transferred in New Orleans. Two instruments were used, one that asked the subject how they acquired guns and the other how people in their city acquired guns. In Maryland, we were able to identify 173 incarcerated offenders who had been convicted between 2010 and 2015 in Prince George's County of using a gun in a crime. Of these inmates, 149 were available for administration of the survey and sixty-eight completed the survey. This is a total response rate of 39.3 percent and an available rate of 45.6 percent. Surveys were administered to these offenders individually, or in groups of as many as twenty-one, at nine institutions using the version of the instrument that asked about gun acquisition in their jurisdiction. In both versions of the survey, inmates were asked to provide opinions based on hypothetical scenarios (for example, "Assuming someone wanted to get a weapon to use to commit a crime in New Orleans, how would they get this weapon?"). In summary, for the inmate surveys we present responses for 265 individuals (207 in New Orleans, and 58 in Prince George's County).[28] Monetary compensation was not provided to participants at the request of prison officials.[29]

In Chicago, interviews were attempted with 138 individuals who were detained in the Cook County Jail for gun possession or who had a history of gun crime involvement. Interviews were completed with ninety-nine of those sampled. The sample was not randomly selected but rather was a convenience sample of gun-involved arrestees. Those who participated received a ten-dollar phone card in their account. The interview consisted of forty open-ended questions, conducted by interviewers under the direction of Alisù Schoua-Glusburg's firm Research Support Services. Respondents were asked how they acquired guns and from whom and, hypothetically, how guns could be acquired in their neighborhood. Their responses to this more general question are used here for comparability with the questions posed to respondents in New Orleans and Prince George's County (for responses to the more specific questions, see Cook, Parker, and Pollack 2015).

In all instances, we assured respondents that their answers would not be shared with anyone outside the project and gave them ample opportunity to not participate.[30] We found respondents eager to participate. In addition, we consider the results from federal surveys of gun use reported by offenders to provide a broader source of respondents than in our surveys.

Further, we acknowledge that different sampling schemes and questions were used across sites.[31] We might expect that a random sample of violent inmates in New Orleans and Prince

28. In Maryland, refusals to participate primarily reflected a strong gang and no-snitch culture in the prisons.

29. Individuals who completed the instrument were informed that they could request a written letter of appreciation from the research staff, which would be placed in their file.

30. Human subject reviews were conducted for all locations.

31. In Louisiana, no differences were discernable in findings between those who were administered an instrument asking about their personal acquisition or about acquisition by those in their jurisdiction. In Chicago, responses differed depending on whether the response set was the respondent's actions or those in their neighbor-

George's County have different knowledge of gun acquisition than arrestees sampled on gun-related charges in the Cook County Jail. In any case, neither sample is ideally representative of gun assaults in any jurisdiction. However, the two populations are likely to have important knowledge, though perhaps differing levels of familiarity, of how individuals who may use guns in crime obtain guns when they are likely prohibited from doing so from a gun dealer. Many individuals in our samples who might have a prior criminal record cannot obtain guns by legal purchase the way that many individuals who possess a gun legally are able to do. They therefore must rely on either other methods or the illegal market. All responses discussed in the following section originate from questions about how respondents think guns are acquired in their jurisdiction based on their local knowledge.[32] We can obtain more information about how these markets work in terms of sources and methods of acquisition by asking those who have knowledge of how it works in their experience.

RESULTS FROM INMATE SURVEYS

We find that across jurisdictions, survey methods, and time periods, respondents are most likely to report that individuals in their jurisdiction would purchase their firearm than acquire it in any other way. In all jurisdictions, we find that respondents reported that individuals in their jurisdictions were most likely to acquire the weapon "on the street" than from other sources, followed by family or friend. In each jurisdiction, a street source is the most likely method of acquisition.

Paying to Acquire a Firearm

In all jurisdictions, the most frequent response to how individuals acquire guns was to buy one. In New Orleans, 43 percent of respondents reported that paying for a gun was the most common method of acquisition in their jurisdiction, Chicago and Prince George's County respondents reporting 82 percent and 66 percent respectively. It is possible that the different rates for buying a gun in the different markets could pertain to regulations in place in higher regulation states, though many other factors could also account for the response and this information does not permit us to draw conclusions about the differences. What is clear from our data across jurisdictions is the importance of payment in acquiring a firearm.

The source most frequently reported in their respective markets was "on the street," indicating the importance of the underground, illegal market in all jurisdictions. In New Orleans, paying for a gun in the illegal market made up 70 percent of all responses where payment was cited, or 30 percent of overall responses. In Chicago, of responses involving payment, 54 percent involved a street source, making up 44 percent of all gun transactions. In Prince George's County, of all responses involving payment, 68 percent were from a street source, totaling 45 percent of all responses tabulated. Despite the lower reported rate of overall street transactions in New Orleans, the importance of purchasing a gun in the illegal market as a source of guns to individuals who might use them in crime is common to all jurisdictions.

Payment for a firearm at gun stores was also reported across jurisdictions. What we find regarding payment for a firearm from a gun store is that though respondents report its occurrence, it is not a majority in any of the jurisdictions: 7 percent in New Orleans, 10 percent in Prince George's County, and 19 percent in Chicago. It is possible that in New Orleans the

hood (see tables A4 and A5). The primary difference in Chicago is in the different rates of theft and borrowing reported; individuals were more likely to borrow and less likely to report theft for their own gun acquisition than their perceptions of the market as a whole. These differences reinforce the need for a program of methodological research on surveying about guns.

32. In Chicago, responses to "how do guns come into the neighborhood?" were coded from open-ended responses to interviewer questions. In New Orleans and Prince George's County, responses to "assuming someone wanted to get a weapon to use to commit a crime, how would they get this weapon?" were coded from close-ended responses to a written survey (see table 8).

denser gun availability drives fewer individuals to a gun store, but the lower proportion could also result from lesser police enforcement, stringent dealers, or other factors beyond the scope of this article.

To a lesser extent, individuals reported purchasing firearms from family or friends. One respondent in New Orleans said that paying family or friends was a possibility, and in Prince George's County and Chicago, 13 percent and 24 percent said the same.

Theft to Acquire a Firearm

Respondents in all jurisdictions reported that gun theft was a common method of acquiring a firearm, ranking below payment in all jurisdictions and above borrowing in all jurisdictions by similar proportions. New Orleans respondents reported that 39 percent of the time, individuals would acquire their gun by theft. Prince George's County and Chicago markets were lower, 25 percent and 12 percent respectively. These rates are consistent in that gun theft is a source of guns to potentially prohibited possessors in all jurisdictions though not as primary a method of gun acquisition as paying for a gun.

Each jurisdiction is also similar with regard to the distribution among possible sources of theft—that is, from family or friend, on the street, pawn shops, gun shows, or gun shops. All respondents across all jurisdictions reported that gun theft from "the street" is the way to obtain guns in the illegal market, all jurisdictions citing at least 55 percent of guns were obtained from the illegal market. The second primary source reported, also at a similar rate of approximately 20 percent, is friends or family. Significantly, obtaining stolen guns on the street does not equate to the quantity of stolen guns in a jurisdiction but rather a single transaction a respondent reported. It is possible that gun theft is a repeated process in the course of a gun changing hands in the illegal market. Finally, few respondents thought that sources such as pawn shops or gun shows were sources from which guns could be stolen.

Borrowing to Obtain a Firearm

With regard to borrowing as a source of firearms, all jurisdictions reported that borrowing a gun is a way of acquiring a firearm, but not as important a one as either buying or stealing. In New Orleans, 17.9 percent of respondents reported that they would borrow a gun versus 6 percent in Chicago and 9 percent in Prince George's County. Because of these small numbers (n=5 and n=4), we cannot speak to the distribution of guns among the sources from which a gun could be borrowed. In New Orleans, most respondents reported that they would borrow a firearm from family and friends or on the street. What is notable overall is that the reported incidence of borrowing a gun is lower than either theft or payment in the overall sample.

Sources for Acquisition

Across methodologies, jurisdictions, and time frames, respondents reported the most likely source for acquiring a firearm is on the street (see table 9). In New Orleans, 73 percent of respondents reported that they would obtain a gun from a street source, in Prince George's County 69 percent and in Chicago 51 percent. In all jurisdictions, though with some range, more than half indicated that they would acquire a firearm from a source on the street. These transactions include borrowing, paying for, and stealing a gun, though across all jurisdictions, the most frequent method is paying for it.

All jurisdictions reported that the next most common source involves family and friends or relatives: in New Orleans 18 percent, in Prince George's County 14 percent, and in Chicago 28 percent. The third most common in Chicago and Prince George's County is gun shops, hardware stores, and mail order or ad sales.

Few respondents reported gun shows as a source for purchasing a gun. In New Orleans, none did, in Prince George's County 4 percent, and in Chicago 1 percent. It is possible that for the individuals in our samples, access to gun shows might be limited by other factors, such as transportation, and that instead relatively few individuals could traffic from gun shows, thus supplying the illegal market from gun shows. Traffickers who profitably transfer guns may not often appear in data collection of individuals in prison or in jail for gun-related or violent offenses. Acknowledging this limita-

Table 9. Methods and Sources of Gun Acquisition

	New Orleans				Prince George's County				Chicago[a]			
	Steal (%)	Borrow (%t)	Pay[b] (%)	Total	Steal (%)	Borrow (%)	Pay[b] (%)	Total	Steal (%)	Borrow (%)	Pay[b] (%)	Total
Family or friend	20.7 n=17	51.4 n=19	1.1 n=1	17.9 n=37	13.3 n=2	20.0 n=1	13.2 n=5	13.8 n=8	22.2 n=2	100.0 n=4	24.1 n=14	28.2 n=20
On the street	70.7 n=58	32.4 n=12	70.5 n=62	63.8 n=132	73.3 n=11	60.0 n=3	68.4 n=26	69.0 n=40	55.6 n=5	0.0 n=0	53.5 n=31	50.7 n=36
Pawnshop or collector	3.7 n=3	10.8 n=4	6.8 n=6	6.3 n=13	6.7 n=1	0.0 n=0	2.6 n=1	3.5 n=2	0.0 n=0	0.0 n=0	0.0 n=0	0.0 n=0
Gun show	0.0 n=0	0.0 n=0	0.0 n=0	0.0 n=0	0.0 n=0	0.0 n=0	5.3 n=2	3.5 n=2	0.0 n=0	0.0 n=0	1.7 n=1	1.4 n=1
Gun shop, hardware store, mail order, ad sale	4.9 n=4	5.4 n=2	21.6 n=19	12.1 n=25	6.7 n=1	20.0 n=1	10.5 n=4	10.3 n=6	22.2 n=2	0.0 n=0	20.7 n=12	19.7 n=14
Total	n=82	n=37	n=88	n=207	n=15	n=5	n=38	n=58	n=9	n=4	n=58	n=71

Source: Authors' calculations.

[a]Chicago's survey method was an open-ended interview; not all responses can be categorized into similar categories. Those answers excluded include responses such as "I don't know" or refusals to answer as well as "other."

[b]*Pay* is a summary measure of the responses *rent*, *trade*, and *buy*.

tion, we find gun shows were not reported to be a proximate source for individuals arrested or in prison.

Comparison with Existing Surveys of Gun Acquisition

We compared our survey data with existing sources to provide additional context and verification of our findings. We used federal survey data from the SISCF and SILJ to replicate the samples of prisons in New Orleans and Prince George's County along with a sample of jail arrestees to replicate Chicago's sample. We find that relative to federal survey data, the largest sources and methods of gun acquisition in our jurisdictions are largely in line with prior estimates. Federal data match the importance of paying for a gun in each jurisdiction as the most prevalent method of acquisition. Theft and borrowing are below payment, as in the jurisdiction surveys, but their rank ordering differs. In federal surveys, borrowing is more frequent than theft, unlike in the jurisdictional surveys. The largest difference is in the importance of theft. In federal surveys, respondents reported stealing the firearm used in crime in fewer than 7 percent of cases; but in jurisdictional surveys, theft accounted for at least 12 percent in Chicago and as high as 39 percent in New Orleans. Federal surveys also report borrowing firearms more frequently, at 16 to 18 percent. The importance of family and friends as sources of firearms for potentially prohibited possessors is clear in both surveys, though jurisdictional respondents all reported street sources as more prevalent (see tables A2 and A3).

The many reasons for these differences are impossible to discern from either our data or federal data and could include time frames, sampling methods, and enforcement actions, among others. It could also be that the jurisdictional differences in proportion are masked in a national sample. Several defining characteristics regarding sources and methods of gun acquisition were corroborated in federal surveys.

In summary, the survey analyses reveal several significant findings. Survey participants in New Orleans, Prince George's County, and Chicago cite the illegal or street market as the most significant potential source for crime guns. The most prevalent transaction type in all jurisdictions was purchase from a street source. Family and friends were also identified as important sources. Most respondents reported purchasing the firearm rather than stealing or borrowing it. Purchases were rarely reported to originate from either gun stores or gun shows across the survey samples. Few respondents reported gun shows as a source; no respondent in New Orleans did so. Gun stores were used in fewer than 20 percent of crime gun transactions. Purchase was the most common method of acquisition, but distribution across stealing, borrowing, and paying varied from jurisdiction to jurisdiction.

CONCLUSIONS

The results of our research, which sought to describe a significant portion of the process of how individuals acquire guns that are used in crimes, especially violent crimes, has led us to focus on the consideration of three related issues: methodological issues in doing this research; descriptive information about criminals' sources of firearms across three jurisdictions that are both similar and vary on a number of characteristics, including levels of gun regulation; and the implications these findings may have for law enforcement efforts to reduce gun violence. We consider these issues with a clear understanding of the limitations of our research but also with the goal of encouraging others to learn from the problems we encountered and our findings to advance this critical research area.

Data Acquisition and Reliability

In two of the three jurisdictions studied, we encountered substantial difficulty in gaining access to the ATF trace data even though the relevant law enforcement agencies had requested their data and supported our research. The ATF is permitted to provide its data to law enforcement agencies for law enforcement purposes, but in two of the jurisdictions they resisted and in the other the data were supplied without delay. The ATF has entered into Memoranda of Understanding with these agencies, authorizing the ATF to approve the release of an agency's data to a third party. The research community should take note of this ex-

ample and help the ATF understand why researchers working with law enforcement agencies using ATF trace data can yield insights useful to those agencies, policymakers, and the public. Given that our work with these data makes clear that the ATF performs minimal data checks, that law enforcement agencies submit different data with their trace requests, and that the trace results contain errors, concerted effort to improve the quality of trace data is also needed. Greater access will help law enforcement agencies better understand the strategic value of trace results and will help improve their accuracy.

Similarly, in conducting inmate surveys, we encountered considerable difficulties in obtaining inmate cooperation in two of our three jurisdictions. Human subjects committees, the NIJ, and some of the correctional agencies discouraged offering cash incentives to inmates to participate. As a result, without substantial cooperation from correctional personnel, response rates are less than is ideal for good research.

Gun owners have many legitimate concerns about the uses of data acquired for research on guns. However, concern about accessing information that law enforcement agencies have generated for the ATF and that Congress has indicated can be provided to those agencies is not legitimate. Although no one wants to coerce inmates to engage in research that has more than minimal risk, inmates should not be deprived of rewards for participating in less than minimal risk research that would be readily available to others. Without some improvements to the quality of and access to trace data, and better ways to gain information from those engaged in gun violence, we are unlikely to significantly advance our understanding of the acquisition of guns used in crimes.

Jurisdictional Commonalities and Differences

We find numerous similarities and differences in crime gun sources, methods of acquisition, time to recovery, and purchasing patterns across our three jurisdictions. Throughout this article, we have made and examined (but not tested) hypotheses based on the levels of gun regulation across our three jurisdictions because these regulations should have some of the greatest impact on illicit gun use, which is supported by considerable research. Because we do not attempt to causally identify the effect or effects of these gun regulations, however, our findings remain descriptive and open to a number of interpretations. We must rely on future research and methods that allow for causal identification to interpret how much of the differences across jurisdictions are due to gun regulations as opposed to other social and political forces. Because the jurisdictions were selected based on their level of gun regulation, however, we present differences in that regard.

Consistent with existing research, we find that crime guns are more likely to be purchased in-state in low regulation jurisdictions; this finding is reflected in shorter times-to-recovery and probably lower monetary costs, and suggests that more lax regulation is correlated with the likelihood of purchasing guns later recovered in crime from an in-state source. Still, although the rates differ, most crime guns are purchased in-state in all of our jurisdictions.

Our research also makes it clear that most offenders report that the primary source of crime guns is from street sources where a transaction between individuals is the primary mechanism for acquiring guns later recovered. These results differ from those found in Chicago (Cook et al. 2015), reflecting the methodological differences in the sample and survey, but possibly also a greater need to understand inmate responses and behaviors as elicited in surveys. We still do not know the path of the gun from legal purchase to the street.

Implications for Law Enforcement

Law enforcement agencies are only just beginning to understand how the analysis of trace and other data on crime guns can assist them in reducing violent crime. In the three agencies we worked with, routine analysis is limited on trace data that might allow patterns of access including large volume dealers and repeat purchasers of crime guns to be identified. This situation is beginning to change. In 2008, ATF launched the Interstate Trafficking Program, which used trace data from multiple agencies to target law enforcement efforts (Lisko and

Arends 2015). This effort was evaluated by the IACP in 2013. It revealed evidence of the use of trace data but subsequent analysis was infrequent, even in gun fusion centers. The Providence Police Department has recently assigned an officer to trace all guns recovered and to use the trace results and then to track the gun from first legal owner to use in crime (Milkovits 2015). Similar efforts are under way in the Wilmington Police Department. Milwaukee launched a multiagency effort that included analysis of trace results to target enforcement (Horn 2015; Lisko and Arends 2015). These tend to be the exception. Law enforcement agencies continue to be case-focused in the use of trace data rather than strategic.

The similarities across jurisdictions suggest several important implications for law enforcement. First, the purchase of guns later recovered in crime did not often originate from gun stores in any of the jurisdictions we studied in any of our data sources.[33] The same purchaser-possessor relationships in the trace data and the infrequent reports of purchasing a gun at a gun store among inmates and arrestees surveyed suggests that enforcement against illegal gun purchases targeted at gun stores may not be the most effective route for police when other enforcement options are possible. Second, although the trace data cannot corroborate this finding, the proportion of firearms purchased from a gun show was markedly low in every jurisdiction. It is possible that gun shows and similar events play a role in arming individuals who are likely to use a gun in crime by arming not those in prison, but instead potential brokers who sell guns to others. However, the individuals sampled who were incarcerated or in jail for potentially violent offenses involving a gun had not acquired their firearms from gun shows.

Additionally, the importance of street transactions in arming individuals suggests that actions police can take to increase the difficulty of these transactions could be effective in deterring them or increasing the difficulty of their occurrence. That is, operations in which the police seek to deter transactions through purchasing illegal guns in an effort to arrest individuals who sell them would be more attuned to transactions that arm individuals who might use the gun than gun store or gun show enforcement efforts would.

Lack of police emphasis on gun trace data is unfortunate in part because we are beginning to assemble a number of programs that are effective in reducing gun violence if police understand the nature of gun violence, including gun markets, as they deploy their resources. Using these programs, Charles Wellford, Megan Collins, and Carlos Acosta developed a guide for police agencies to address gun violence that includes careful analysis of their trace data (2016). Further developments in the use of trace and survey data by police in part depends on addressing the access issue and improving the data as discussed in this article.

33. In a related project, we interviewed 181 of the original legal purchasers of the guns recovered in violent crimes in New Orleans and Prince George's County. Although our analysis of these data continues, we do note that 41 percent of respondents reported their gun had been stolen and 33 percent reported that they had sold their gun. We were unable to locate 19 percent of this group. No one objected to being interviewed about how their gun left their possession. All of the guns were purchased legally through an FFL.

APPENDIX

Table A1. Alternative Straw Purchaser Operationalizations

	New Orleans			Chicago			Prince George's County		
	Number of Cases	Traced	%	Number of Cases	Traced	%	Number of Cases	Traced	%
Female purchaser, male possessor and pistol or revolver[a]	208	1,461	14.2	862	6,388	13.5	85	813	10.5
In-state purchaser[a,b]	171	206	83.0	279	830	33.6	30	81	37.0
Out-of-state purchaser[a,b]	35	206	17.0	551	830	66.4	51	81	63.0
Less than two years TTR[a,c]	59	207	28.5	153	861	17.7	21	84	25.0
More than two years TTR[a,c]	149	207	72.0	664	861	77.1	64	84	76.2
High-caliber firearm[a,d]	73	208	35.1	183	862	21.2	27	85	31.8
Weapon offense[a,e]	102	208	49.0	688	817	84.2	43	85	50.6
Felon in possession of weapon[a,e]	47	208	22.6	92	817	11.3	N/A	85	N/A
Same address, different buyer[f]	N/A	N/A	N/A	170	5,981	2.8	25	832	3.0
Same last name, same address, different buyer[f,g]	N/A	N/A	N/A	92	5,981	1.5	15	832	1.8

Source: Authors' calculations.

[a]Total includes cases not missing information on purchaser or possessor gender or type of weapon.

[b]Total additionally includes cases not missing information on purchaser state.

[c]Total additionally includes cases not missing information on time to recovery.

[d]Total additionally includes cases not missing information on caliber.

[e]Total additionally includes cases not missing information on offense type.

[f]Total includes cases not missing information on purchaser and possessor address.

[g]Total additionally includes cases not missing information on purchaser and possessor last name.

Table A2. Methods of Gun Acquisition

	Violent Offenders (<Two Years Incarcerated)[a] (percentage)	Gun Offenders (<Five Years Incarcerated)[b] (percentage)
I stole it	6.3, n=14	4.7, n=38
I rented it	0.0, n=0	0.5, n=4
I borrowed it from somebody / held it for somebody	18.4, n=41	16.0, n=129
I traded something for it	4.0, n=9	3.6, n=29
I bought it	47.5, n=106	48.0, n=387
It was a gift	9.0, n=20	9.9, n=80
Other	9.4, n=21	9.3, n=75
Don't know, refused	5.4, n=12	7.9, n=64
Total responses	100, n=223	100, n=806

Source: Authors' tabulation based on the National Archive of Criminal Justice Data (Bureau of Justice Statistics 2007).
Note: Data from Survey of Inmates in State and Federal Corrections Facilities (SISCF).
[a] SISCF Sample: Offenders who reported violent offenses (V0729 =1; V0730=1; V0731=1) and who have been incarcerated for less than two years.
[b] SISCF Sample: Offenders who reported carrying a gun at the time of their crime (V1072=1 and V1073=1) who had been incarcerated for less than five years.

Table A3. Sources of Firearms

	Violent Offenders (<Two years incarcerated)[a] N (percent)	Gun Offenders (<Five years incarcerated)[b] N (percent)
From a gun shop or gun store	12.5,, n=27	8.9, n=69
From a pawnshop	2.3,, n=5	3.1, n=24
At a flea market	0.0, n=0	0.3, n=2
At a gun show	1.4, n=3	1.2, n=9
From the victim(s)	3.2, n=7	2.5, n=19
From a friend or family member	39.8, n=86	38.3, n=296
From a fence or black market source	5.1, n=11	5.0, n=39
Off the street or from a drug dealer	22.2, n=48	24.7, n=191
In a burglary	1.4, n=3	1.6, n=12
Other	6.9, n=15	7.4, n=57
Don't know or refused	5.1, n=11	7.1, n=55
Total responses	100, n=216	100, n=773

Source: Authors' tabulation based on the National Archive of Criminal Justice Data (Bureau of Justice Statistics 2007).
Note: Data from Survey of Inmates in State and Federal Corrections Facilities (SISCF).
[a] SISCF Sample: Offenders who reported violent offenses (V0729 =1; V0730=1; V0731=1) and who have been incarcerated for less than two years.
[b] SISCF Sample: Offenders who reported carrying a gun at the time of their crime (V1072=1 and V1073=1) who had been incarcerated for less than five years.

Table A4. Chicago Methods of Firearm Acquisition

Method	Percentage
Buy or trade	61.5, n=83
Borrow or hold	10.4, n=14
Gift	8.9, n=12
Share	7.4, n=10
Steal	1.5, n=2
Unclear	8.9, n=12
Refuse to answer	1.5, n=2
Total	100, n=135

Source: Cook et al. 2015.

Table A5. Chicago Sources of Firearm Acquisition

Source	Percentage
Prior relationship	44.3, n=31
Other connections	21.4, n=23
Gun store	2.9, n=2
Unclear	27.1, n=19
Refuses to answer or NA	4.3, n=3
Total	100, n=70

Source: Cook et al. 2015.

Table A6. Firearms Submitted for Tracing and Available Information

Denominator	New Orleans, 2011–2012	Chicago, 2011–2013	Prince George's County, 2012–2013
1. Total number of guns submitted for tracing	3,068	18,455	2,034
2. All successfully traced crime guns with a purchaser first name, last name, and date of birth	2,269	11,248	1,286
3. Successfully traced crime guns (Denominator 2) with state of first purchase	2,249	11,000	1,272
4. Successfully traced crime guns (Denominator 2) with possessor first name, last name	1,660	7,978	894
5. Successfully traced crime guns (Denominator 2) with possessor first and last name, and purchaser and possessor gender	1,461	7,095	813

Source: Authors' calculations.

REFERENCES

Azrael, Deborah, Phillip J. Cook, and Matthew Miller. 2004. "State and Local Prevalence of Firearms Ownership Measurement, Structure, and Trends." *Journal of Quantitative Criminology* 20(1): 43–62.

Beck, Allen, Darrell Gilliard, Lawrence Greenfeld, Caroline Harlow, Thomas Hester, Louis Jankowski, Tracy Snell, James Stephan, and Danielle Morton. 1993. "Survey of State Prison Inmates, 1991." NCJ-136949. Washington: U.S. Department of Justice, Bureau of Justice Statistics.

Braga, Anthony A. 2017. "Long-Term Trends in the Sources of Boston Crime Guns." *RSF: The Russell Sage Foundation Journal of the Social Sciences* 3(5): 76–95. DOI: 10.7758/RSF.2017.3.5.04.

Braga, Anthony A., Phillip J. Cook, David M. Kennedy, and Mark H. Moore. 2002. "The Illegal Supply of Firearms." *Crime and Justice* 29: 319–52.

Braga, Anthony A., Garen J. Wintemute, Glenn L. Pierce, Phillip J. Cook, and Greg Ridgeway. 2012. "Interpreting the Empirical Evidence on Illegal Gun Market Dynamics." *Journal of Urban Health* 89(5): 779–93.

Bureau of Alcohol, Tobacco and Firearms (ATF). 1992. "Protecting America: The Effectiveness of the Federal Armed Career Criminal Statute." Washington: U.S. Department of Justice. Accessed July 5, 2017. https://www.ncjrs.gov /pdffiles1/ Digitization/137208 NCJRS.pdf.

———. 2000a. "Following the Gun: Enforcing Federal Laws Against Firearms Traffickers." Washington: U.S. Department of Justice. Accessed July 5, 2017. https://www.atf.gov/file/11876/download.

———. 2000b. "Crime Gun Trace Reports (1999)." Washington: U.S. Department of Justice. Accessed July 5, 2017. https://www.atf.gov/resource-center/docs/ycgii-report-1999-highlightspdf-0/download.

Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF). 2015. "Fact Sheet – National Tracing Center." Washington: U.S. Department of Justice. Accessed March 2016. https://www.atf.gov/resource-center/fact-sheet/fact-sheet-national-tracing-center-ntc.

———. 2016. "Fact Sheet – Multiple Firearms Sales or Other Disposition Reporting." Washington: U.S. Department of Justice. Accessed July 7, 2017. https://www.atf.gov/resource-center/fact-sheet/fact-sheet-multiple-firearms-sales-or-other-disposition-reporting.

Bureau of Justice Statistics. 2007. "Survey of Inmates in State and Federal Correctional Facilities, 2004 (ICPSR 4572)." Ann Arbor: University of Michigan, Institute for Social Research. Accessed July 15, 2017. http://www.icpsr.umich.edu/icpsrweb/NACJD/studies/4572?q=ICPSR+4572.

Centers for Disease Control and Prevention (CDC), National Center for Health Statistics. 2016. "Underlying Cause of Death 1999–2015" on CDC Wonder online database, released December 2016, from Multiple Cause of Death files, 1999–2015, Vital Statistics Cooperative Program. Accessed August 15, 2017. https://wonder.cdc.gov/ucd-icd10.html.

Cook, Philip J., and Anthony A. Braga. 2001. "Comprehensive Firearms Tracing: Strategic and Investigative Uses of New Data on Firearms Markets." *Arizona Law Review* 43: 277–309.

Cook, Phillip J., Richard J. Harris, Jens Ludwig, and Harold A. Pollack. 2015. "Some Sources of Crime Guns in Chicago: Dirty Dealers, Straw Purchasers, and Traffickers." *Journal of Criminal Law and Criminology* 104(4): 717–59.

Cook, Phillip J., and Jens Ludwig. 1996. *Guns in America: Results of a Comprehensive National Survey on Firearms Ownership and Use*. Washington, D.C.: Police Foundation.

Cook, Phillip J., Jens Ludwig, Sudhir Venkatesh, and Anthony A. Braga. 2007. "Underground Gun Markets." *Economic Journal* 117: F558–88.

Cook, Phillip J., Susan T. Parker, and Harold A. Pollack. 2015. "Sources of Guns to Dangerous People: What We Learn by Asking Them." *Preventive Medicine* 79(1): 28–36.

Cook, Philip J., and Harold A. Pollack. 2017. "Reducing Access to Guns by Violent Offenders." *RSF: The Russell Sage Foundation Journal of the Social Sciences* 3(5): 1–36. DOI: 10.7758/RSF.2017.3.5.01.

Federal Bureau of Investigation (FBI). 2011. "Crime in the United States 2010." Washington: U.S. Department of Justice. Accessed December 2015. https://www.fbi.gov/about-us/cjis/ucr/crime-in-the-u.s/2010/crime-in-the-u.s.-2010.

———. 2013. "Crime in the United States 2012." Washington: U.S. Department of Justice. Accessed July 5, 2017. https://ucr.fbi.gov/crime-in-the-u.s/2012/crime-in-the-u.s.-2012.

———. 2016. "Crime in the United States 2015." Washington: U.S. Department of Justice. Accessed December 2016. https://ucr.fbi.gov/crime-in-the-u.s/2015/crime-in-the-u.s.-2015.

Gast, Scott. 2005. "Appendix C: Judicial Scrutiny of Challenged Gun Control Regulations: The Implications of an Individual Right Interpretation of the Second Amendment." In *Firearms and Violence: A Critical Review*, ed. Charles F. Wellford, John V. Pepper, and Carol V. Petrie. Washington, D.C.: National Academies Press.

Horn, Brittany. 2015. "Semi-Automatics Key Factor in Wilmington Violence." *Delaware Online*, December 11, 2015. Accessed July 5, 2017. http://www.delawareonline.com/story/news/crime/2015/12/11/semi-automatics-key-factor-wilmington-violence/75169628/.

Kanter, Dan, and Craig Fischer, eds. 2010. "Guns and Crime: Breaking New Ground by Focusing on the Local Impact." Washington, D.C.: Police Executive Research Forum. Accessed July 5, 2017. http://www.policeforum.org/assets/docs/Critical_Issues_Series/guns%20and%20crime%20-%20breaking%20new%20ground%20by%20focusing%20on%20the%20local%20impact%202010.pdf.

Koper, Christopher S. 2014. "Crime Gun Risk Factors: Buyer, Seller, Firearm, and Transaction Characteristics Associated with Gun Trafficking and Criminal Gun Use." *Journal of Quantitative Criminology* 30(2): 285–315.

Koper, Christopher S., and Peter Reuter. 1996. "Suppressing Illegal Gun Markets: Lessons from Drug Enforcement." *Law and Contemporary Problems* 59(1): 119–46.

Law Center to Prevent Gun Violence. 2014. "Annual

Gun Law State Scorecard, 2014." Accessed July 5, 2017. http://gunlawscorecard.org.

Lisko, Richard, and Ross Arends. 2015. "The ATF iTrafficking Program: Integration of Firearms Trace/Ballistic Data into Fusion Center Intelligence Sharing." *Police Chief* 82(1): 50–55.

Mayors Against Illegal Guns. 2010. "Trace the Guns: The Link Between Gun Laws and Interstate Gun Trafficking." Accessed July 5, 2017. https://tracetheguns.org/report.pdf.

Milkovits, Amanda. 2015. "On the Trail of Guns in Providence." *Providence Journal*, November 28. Accessed July 5, 2017. http://www.providencejournal.com/article/20151128/NEWS/151129373.

Moore, Mark H. 1981. "Keeping Handguns from Criminal Offenders." *Annals of the American Academy of Political and Social Science* 455(1): 92–109.

National Institute of Justice (NIJ). 2011. *Firearms and Violence Topical Working Group Meeting Summary 2011*. NCJ 238490. Washington: U.S. Department of Justice. Accessed July 5, 2017. https://www.ncjrs.gov/pdffiles1/nij/238490.pdf.

Pierce, Glenn L., Anthony A. Braga, Raymond R. Hayatt Jr., and Christopher S. Koper. 2004. "Characteristics and Dynamics of Illegal Firearms Markets: Implications for a Supply-Side Enforcement Strategy." *Justice Quarterly* 21(2): 391–422.

Sheley, Joseph F., and James D. Wright. 1993. "Gun Acquisition and Possession in Selected Juvenile Samples." Research in Brief. Washington: U.S. Department of Justice, Office of Justice Programs, National Institute of Justice.

U.S. Census Bureau. 2010. "Profile of General Population by Housing Data." Accessed August 15, 2017. https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=cf.

Vittes, Katherine A., Jon S. Vernick, and Daniel W. Webster. 2012. "Legal Status and Source of Offenders' Firearms in States with the Least Stringent Criteria for Gun Ownership." *Injury Prevention* 19(1): 26–31.

Wachtel, Julius. 1998. "Sources of Crime Guns in Los Angeles, California." *Policing: An International Journal of Police Strategies & Management* 21(2): 220–39.

Webster, Daniel W., Lorraine H. Freed, Shannon Frattaroli, and Modena H. Wilson. 2002. "How Delinquent Youths Acquire Guns: Initial Versus Most Recent Gun Acquisitions." *Journal of Urban Health* 79(1): 60–69.

Webster, Daniel W., Jon S Vernick, and Lisa M. Hepburn. 2001. "Relationship Between Licensing, Registration, and Other Gun Sales Laws and the Source State of Crime Guns." *Injury Prevention* 7(3): 184–89.

Weil, Douglas S., and Rebecca C. Knox. 2016. "Effects of Limiting Handgun Purchases on Interstate Transfer of Firearms." *Journal of the American Medical Association* 275(22): 1759–61.

Wellford, Charles F., Megan E. Collins, and Carlos F. Acosta. 2016. "Policing Gun Violence: What Works?" *Police Chief Magazine,* May. Accessed July 5, 2017. http://www.policechiefmagazine.org/policing-gun-violence-what-works/.

Wellford, Charles F., John Pepper, and Carol Petrie, eds. 2005. *Firearms and Violence: A Critical Review.* Committee to Improve Research and Information on Firearms. Washington, D.C.: National Academies Press.

Wintemute, Garen. 2010. "Firearm Retailers' Willingness to Participate in an Illegal Gun Purchase." *Journal of Urban Health* 87(5): 865–78.

———. 2017. "Firearms Licensee Characteristics Associated with Sales of Crime-Involved Firearms and Denied Sales: Findings from the Firearms Licensee Survey." *RSF: The Russell Sage Foundation Journal of the Social Sciences* 3(5): 58–74. DOI: 10.7758/RSF.2017.3.5.03.

Wright, James D., and Peter H. Rossi. 1994. *Armed and Considered Dangerous: A Survey of Felons and their Firearms*. Hawthorne, N.Y.: Aldine de Gruyter.

Wright, Mona A., Garen J. Wintemute, and Daniel W. Webster. 2010. "Factors Affecting a Recently Purchased Handgun's Risk for Use in Crime Under Circumstances That Suggest Gun Trafficking." *Journal of Urban Health* 87(3): 352–64.