

RESEARCH ARTICLE

CHICAGO'S GROUP VIOLENCE REDUCTION STRATEGY

Changing the Street Dynamic

Evaluating Chicago's Group Violence Reduction Strategy

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Research Summary

This study uses a quasi-experimental design to evaluate the efficacy of Chicago's Group Violence Reduction Strategy (VRS), a gun violence reduction program that delivers a focused-deterrence and legitimacy-based message to gang factions through a series of hour-long "call-ins." The results suggest that those gang factions who attend a VRS call-in experience a 23% reduction in overall shooting behavior and a 32% reduction in gunshot victimization in the year after treatment compared with similar factions.

Policy Implications

Gun violence in U.S. cities often is concentrated in small geographic areas and in small networks of group or gang-involved individuals. The results of this study suggest that focused intervention efforts such as VRS can produce significant reductions in gun violence, but especially gunshot victimization, among gangs. Focused programs such as

This project was supported by Grants 11-99431-000-USP and 12-101543-000-USP awarded by the John D. and Catherine T. MacArthur Foundation and by a CAREER award (SES-1151449) from the Sociology and Law and Social Science Programs at the National Science Foundation. The authors would like to thank the funders and the VRS and Urban Institute Team, the National Network for Safe Communities, and the Chicago Police Department. We also acknowledge the research support of Tony Cheng and the excellent data support provided by Tim Lavery. The opinions and findings expressed in this article are those of the authors and not the funders, the Chicago Police Department, or the City of Chicago. Direct correspondence to Andrew V. Papachristos, Department of Sociology, Yale University, 493 College Street, Room 201, New Haven, CT 06511 (andrew.papachristos@yale.edu).

these offer an important alternative to broad-sweeping practices or policies that might otherwise expand the use of the criminal justice system.

In August 2010, local and national press slammed Chicago Police Superintendent Jody Weis for a meeting he held with approximately six gang members at a park field house on the city's west side. At this "secret gang summit," as one newspaper branded it (Bryne and Ford, 2010), Weis and a group of law enforcement representatives, community members, and service providers met with gang members in an effort to quell escalating gang violence. One side of the political spectrum denounced Weis for "negotiating with terrorists" (The Huffington Post, 2010). Police, some said, were mollicoddling gang members when they should be locking them up. "I can't believe we're sitting down and negotiating with urban terrorists who are killing our kids with guns and drugs on the streets," remarked one City Councilperson (Robinson, 2010). Meanwhile, gang members and other street activists hosted their own press conference, charging that police were unconstitutionally targeting gang members as well as threatening to charge members of a gang with the crimes of their associates. "The police aren't playing fair," leveled one activist, asking "how gang leaders could be asked to take responsibility for their subordinates when city government leaders don't take responsibility for alleged misdeeds by their employees" (Allen, 2010; theGrio, 2010).

The meeting in question was not, in fact, some secret backroom parlay between police and gangs; instead, it was the first Violence Reduction Strategy (VRS) "call-in," Chicago's incarnation of an increasingly popular gun violence reduction strategy that gained popularity in Boston, Massachusetts, and has since been replicated in other cities across the country (Braga, Hureau, and Papachristos, 2013; Engel, Tillyer, and Corsaro, 2013; Kennedy, 2011). The Chicago call-in brought together a group of individuals known to be members or associates of street gangs currently involved in violent disputes to meet with representatives from law enforcement, the community (including the families of victims), and social service providers. The objective of a VRS call-in is simple: deliver a message to gang-involved individuals about the present gun violence situation and tell them, in no uncertain terms, to put down the guns. There were no negotiations, deals, or breaks. The hour-long meeting took place not at a police station or courtroom but at Garfield Park Observatory, one of the city's most stunning public spaces. Everyone went home at the end of the day. No one was arrested or detained against their will.

Attendees of the meeting, nearly all of whom tend to be on probation or parole, were told that police are aware of the ongoing disputes and of their group's current role in such violence. A focused deterrence message is conveyed to attendees that stresses that the next shooting by their group will elicit the full attention of the criminal justice system to use every available legal means to go after the entire group, including arresting members, pulling warrants, revoking parole/probation, and increasing overall pressure on the group (Braga,

Kennedy, Waring, and Piehl, 2001). Representatives from the community are also present, who express their desire to help the attendees and stress their love for them. “You’re part of this community. Our community. Our families. And, we love you,” one mother of a murder victim told the room, showing pictures of her fallen son while fighting back tears. Service providers in the room urge attendees to take advantage of the offer for help—immediately.

In contrast to media reports, the VRS “call-ins” were not entirely new in Chicago. Meetings with a somewhat different focus and target population have been ongoing in Chicago since 2002 as part of Project Safe Neighborhoods (PSN). In fact, a quasi-experimental evaluation of PSN found that the initiative yielded double-digit reductions in homicide in targeted geographic areas (Papachristos, Meares, and Fagan, 2007). The novelty of the VRS call-in was its specific focus on *groups* and its use of new analytic tools to guide the intervention. Specifically, VRS sought to use new data-driven methods—including social network analysis—that fostered a more precise focus of intervention efforts on those groups actively involved in shootings.

The hope of VRS was that these new analytic tools coupled with a novel intervention would go far in reducing gun violence in the Windy City. Proponents of the VRS approach argued that the dynamic of gun violence in most American cities was driven by interpersonal and intergroup disputes that were settled through gunplay; although the specific contexts of such disputes vary by locale, the central street dynamics were the same (Kennedy, 2011). If the street dynamic changes, then gun violence will decrease. Opponents of this approach argued that Chicago is too unique: what worked in Boston, Massachusetts; High Point, North Carolina; or Cincinnati, Ohio will not work in Al Capone’s city. Chicago gangs have been around nearly a half-century; they are too entrenched in the city, too involved in large-scale drug dealing, and simply too violent and unpredictable to be amenable to such an intervention. Chicago’s slight rise in homicide in 2012 seemed to illustrate this point.

This study evaluates the efficacy of Chicago VRS at reducing gun violence by using a quasi-experiment to determine whether those gangs attending a call-in experienced the hypothesized reduction in shooting behavior. Put another way, did VRS change the street dynamics among gangs in Chicago? VRS call-ins have been in continuous operation since the initial August 2010 meeting. Through 2013, 18 call-ins reached 149 gang factions and 438 individual gang members. To analyze changes in both victimization and offending, we use a propensity score matching procedure to match gang factions that attended a call-in to up to three otherwise similar gang factions that did not attend a call-in. Our analyses find that gang factions participating in VRS were significantly less likely to be involved in shootings in the 12 months after call-in attendance than otherwise similar factions that did not participate in VRS.

Homicide, Gangs, and Guns in Chicago

Regardless of its actual violent crime rate, the media, political pundits, popular culture, and at times even academics frequently portray Chicago as one of the country’s most violent

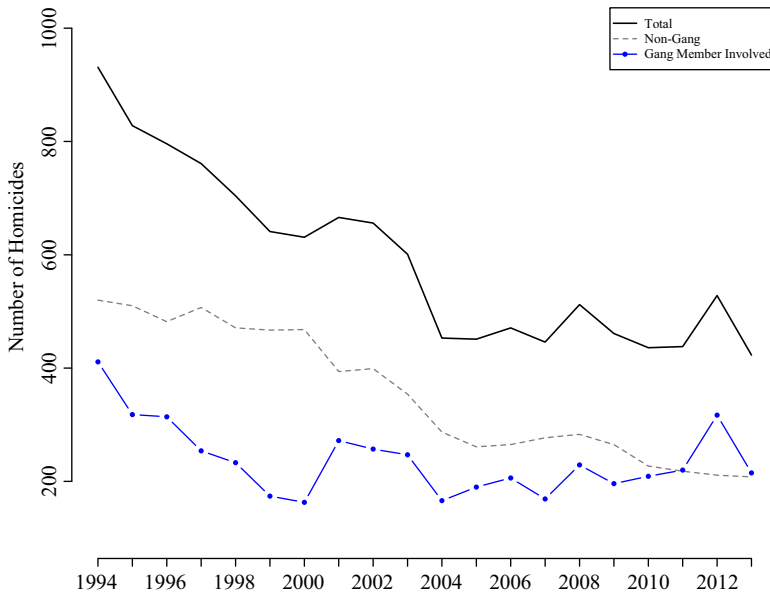
cities. Statistically, crime trends in Chicago mirror the overall national crime decline of the past two decades. In fact, rates of violent crime and homicide in present-day Chicago are currently at the lowest recorded levels in nearly five decades (Papachristos, 2013). To be sure, Chicago tallies a greater *number* of total murders than other cities of comparable size (e.g., Los Angeles, California, and Houston, Texas) and more than New York, which has a population three times its size. The city's overall rates of both violent crime and homicide surpass national averages. But when controlling for population, Chicago's homicide rate does not breach the top 10 most violent cities in the United States. In 2012, the year many branded Chicago the country's "murder capital," Chicago's violent crime rate ranked 19th among law enforcement agencies serving jurisdictions of 250,000 or more—rates similar to those of Houston or Minneapolis, Minnesota, and far lower than Detroit, Michigan; Oakland, California; or St. Louis, Missouri (see Table A1).

Such declining crime rates and city-level comparisons, however, mask more severe disparities in crime and violence *across* Chicago communities. In Chicago, as in most other cities across the country, crime rates vary tremendously by neighborhoods (for a review, see Peterson and Krivo, 2010). Also like most cities, homicide and violent crime in Chicago concentrate in a small number of neighborhoods and geographic microplaces (Kirk and Papachristos, 2011; Morenoff, Sampson, and Raudenbush, 2001; Sampson, 2012). For instance, Garfield Park, on the city's west side, had a 2012 homicide rate of 55 per 100,000, more than three times higher than the city average (approximately 16 per 100,000) and more than 10 times higher than the national average (approximately 5 per 100,000). Meanwhile, Jefferson Park, on the city's northwest side, had a homicide rate of effectively zero. Research since the work of the early Chicago School sociologists documents the remarkable stability of the high crime parts of the city over long periods of time (for a review, see Sampson, 2012). Although nearly all of the high-crime communities also experienced significant declines in crime over recent years, the rates in some high-crime communities—like Garfield Park—remain stubbornly high, generating what some have called a "crime gap" between the safest and most dangerous neighborhoods of the city (Papachristos, 2014).

Homicide and violent crime in Chicago concentrate not just spatially but also socially. Criminological research since Wolfgang's (1958) classic study of offenders in Philadelphia has revealed that a large portion of crime is committed by a small number of offenders—a finding that seems to be as true today as it was nearly five decades ago and applies to cities across the country. Recent research employing social network analysis has extended this logic by examining the exact contours of co-offending networks and the placement of shooting victims within them. A study of one high-crime Boston community, for instance, found that 85% of all fatal and nonfatal gunshot injuries occurred in a single network of individuals who had been arrested that comprised less than 5% of the community's total population (Papachristos, Braga, and Hureau, 2012). Likewise, Papachristos, Wildeman, and Roberto (2015) found that 70% of all nonfatal shootings in the entire city of Chicago occurred in a co-offending network composed of less than 6% of the city's population.

FIGURE 1

Number of Total Homicides, Homicides Involving a Gang Member, and Homicides Not Involving a Gang Member in Chicago, 1994 to 2013



Most strikingly, this line of research found that simply *being in* such networks exponentially increases the likelihood that one becomes a victim of a gunshot injury; in the Chicago study, for instance, being in a network with another gunshot victim increases the probability of being a victim a staggering 900% (Papachristos et al., 2015).

Although the exact estimates vary, there is mounting consensus that a large portion of gun violence and homicide in Chicago is driven by street gangs, either by gang-motivated behavior (such as turf disputes) or the involvement of gang members in group and non-group-related interpersonal disputes (Block and Block, 1995; Papachristos and Kirk, 2006). Figure 1, for instance, displays homicides in Chicago since 1994 disaggregated by whether it was “gang member involved,” meaning that a member of gang was involved as either a victim or an offender. As just described, total homicides in Chicago have declined steadily since 1994 with a few smaller peaks in 2002, 2008, and most recently in 2012. Disaggregating by whether the homicide involved at least one gang member shows that non-gang-involved homicides more closely followed the citywide trend, whereas gang-involved homicides trended upward in 2000 and have remained relatively stable. So, for instance, since the spike in 2002, the yearly number of gang homicides has only declined by 16%, whereas non-gang homicides have declined by nearly 36%. This decrease has a significant impact on the

percentage of total homicides that currently involve a gang member—today, compared with the 1990s, gang-involved homicides constitute a greater percentage of the total homicides in Chicago, roughly 50% to 60%. As such, changes in gang homicide can generate spikes in the overall homicide rate, as observed most recently in 2012. Hence, to stem the tide of violence in Chicago, interventions need to be directed toward altering the dynamics leading to group violence.

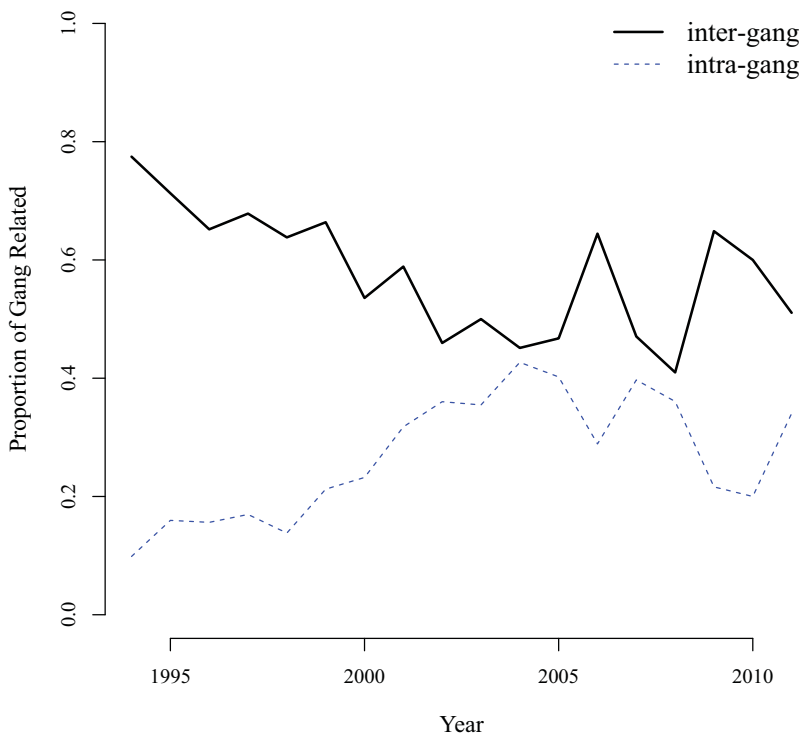
Part of Chicago's image as one of the most violent cities in the nation stems precisely from the reputation of its gangs. Gangs in Chicago have been consistently reported as being more organized and more heavily involved in organized levels of drug dealing than gangs in most other cities (Fagan, 1989; Howell, 2012; Spergel, 1995). Many modern-day Chicago gangs—like the Vice Lords, the Black P. Stone Nation, the Latin Kings, and the Gangster Disciples—trace their origins to the late 1950s and have been involved in a variety of prosocial, political, and criminal activities across the decades (Dawley, 1973; Hagedorn, 2008; Moore and Williams, 2011). In the late 1980s and early 1990s, many of these gangs entered the drug game by orchestrating sophisticated drug-dealing enterprises complete with complex distribution practices, rules and regulations, and violent methods of dispute resolution (Levitt and Venkatesh, 2000; Venkatesh and Levitt, 2000). In some ways, Chicago gangs represent the “worst” of what gangs could become and not, in fact, what the typical American street gang looks like.

However, in recent years, Chicago has witnessed important changes in the nature of its gangs and gang-involved violence. One trend noted by police officials is the splintering of once large gang entities into smaller “factions” or geographically bounded crews. During the height of the crack cocaine era, many Chicago gangs operated under a “corporate” style of operation or, at least, with more formal hierarchical structures—leaders, subgroups, line workers, and so on (Venkatesh and Levitt, 2000). Power was concentrated in the hands of a small number of older gang members—some of whom were incarcerated during their reigns—whereas often younger members assumed the risky “on the street” drug-dealing and violence-related activities. These hierarchical structures seem to have receded during the past decade; many of the larger groups have splintered into smaller factions that operate, for the most part, independently. For example, in the 1990s, the Gangster Disciples prided themselves on their “Board of Directors” and system of “Governors” and “street taxes” that coordinated thousands of members across the city. Today, however, the Gangster Disciples name is more of a “brand” than a functioning organizational structure. Factions still use the Disciple moniker, to be sure. But the main identity has become the local or small group—e.g., The Guttaville Disciples, the 80s Babies Disciples, and so on.¹

1. The causes of this gang splintering seem to be diverse and include (a) long-term effects of gang prosecutions and enforcement actions, (b) changes in local and global drug markets, (c) internal conflicts among gang leadership, and (d) the general fading of large gang alliances over time. In many

FIGURE 2

Intergang versus Intragang Homicides in Chicago, 1994 to 2010



Note. A homicide was defined “inter-gang” when the victim and the offender were from distinct (nonaffiliated) gang groups or factions and “intra-gang” when the victim and the offender were from either (a) the same gang or faction or (b) affiliated gangs or factions.

This splintering of gangs has had a profound effect on the dynamics driving violence on the street. Today, compared with 20 years ago, gang violence is more likely to occur *within* gangs or gang divisions (or between gangs with some affiliation) than it is between distinct gangs. Figure 2 plots inter-gang versus intra-gang homicides in Chicago from 1994 to 2010. In this figure, “intra-gang” refers to any homicide in which the victim and the offender belonged to the *same* gang faction or *related* gang factions (gang factions that share some common ancestry of past alliance—i.e., members of the same gang “nation” such as the Gangster Disciples). “Inter-gang” homicide refers to a homicide in which the victim and the offender belonged to gang factions with no shared alliance or ancestry. This figure

ways, gang factions in Chicago today are beginning to resemble gangs in other cities in that they are increasingly becoming smaller in size and the locus of control.

shows that since the mid-1990s, the number of inter-gang homicides has declined steadily as the number of intra-gang homicides has increased. The two almost converge circa 2004 and have meandered up and down since.

Recent fluctuations notwithstanding, Figure 2 has two important implications for understanding gangs, gang violence, and the street dynamic among gangs. First, the unit of analysis of what constitutes a meaningful point of intervention has changed. Since the 1960s, police in Chicago often have considered “the gang” the largest meaningful unit. Gang nations—like the Gangster Disciples—represent, essentially, federations of gangs. Gang members and their groups were lumped into nation units: A member of the Disciples was considered by police (and, importantly, police data systems) to be a Disciple. But the splintering of gangs has shifted the focus to smaller, often neighborhood-bounded factions that themselves have unique identities, names, and behaviors. Thus, it matters more whether a member is of the Guttavilla Disciples or the 80s Babies Disciples, as the nation as a whole seems no longer to direct organizational behavior in the same way.

Second, understanding faction-level behavior means rethinking group dynamics in Chicago. For decades, gang violence in Chicago has been characterized along first categorical gang nation distinctions: the Disciples versus the Stones, the Latin Kings versus The Latin Saints, and so on. Enforcement and prevention efforts directed resources accordingly, focusing on large organizational behaviors. In contrast, faction-level disputes more closely resemble “family feuds” that tend to be more personal and localized. History still matters, to be sure, but what is happening on the street *today* often provides the spark for feuds and violence. If such types of faction-level disputes are increasingly drivers of gang homicides in Chicago, as Figure 2 suggests, then understanding the proximal motivators for gang disputes means rethinking how we conceive of gang disputes. We must move away from 1980s and 1990s notions of gang disputes in Chicago being motivated purely around the crack trade and age-old vendettas and toward an understanding of the microdynamics of small group conflicts.

Taken together, these trends broadly summarize the current homicide and gun violence problem in Chicago. Despite impressive declines in homicide and violent crime since the 1990s, crime and violence (a) concentrate in a small number of communities and in small social networks, (b) involve a large number of gangs and gang members, and (c) are increasingly driven by disputes among smaller gang groups and factions as opposed to large battling gang nations. Therefore, changing the street dynamics driving gun violence requires engaging these issues in programmatic design and implementation.

Program Intent (and Its Effectiveness)

VRS, like many violence prevention and policing efforts, prides itself on being “data driven.” This buzzword translates into many different forms, often with an eye toward appeasing funding agencies that understand this phrase to mean that practitioners will use data in the planning, implementation, and evaluation of their programs. A successful program is

evidenced by a decline in the targeted crime type or of crime rates in a specified location. The extent to which any specific program is data driven derives, in part, from how much data are available, whether data are analyzed thoroughly or cursorily, and whether participants engage with said data and analytics.

For Chicago VRS, the idea of being “data driven” meant using all available data to identify specific individuals and groups who are actively involved in gun-related disputes and violence in as close to “real time” as possible. VRS did not seek to analyze a series of blanket risk factors for its intervention; it has long been well established that young minority males in specific parts of the city and belonging to street gangs were the most likely victims and perpetrators of violence (Block and Block, 1995; Morenoff et al., 2001; Papachristos and Kirk, 2006). From VRS’s perspective, going to the city’s disadvantaged and high-crime communities to look for street gangs was not a focused strategy. Rather, VRS sought to use the available data to determine *which* individuals and *which* groups were involved in current and ongoing shootings to provide precise and strategic points of interventions. Thus, knowing that “gangs in Englewood” were fighting was insufficient. VRS wanted to know whether a dispute between the Disciples on 67th Street and a “renegade” set of Disciples from 71st Street was responsible for the violence. The entire premise of changing the street dynamics behind gun violence in Chicago is first to use data to determine the actors and disputes of said violence and then to bring the VRS message directly to those involved groups.

This idea of bringing the program and its message directly to those involved in gun violence is based on the principle of focused deterrence (for a review, see Braga and Weisburd, 2012). Unlike general deterrence, which aims to dissuade the general population from engaging in particular criminal behaviors by increasing the severity, certainty, and swiftness of punishments associated with said crime, *focused deterrence* posits that crime reduction is best achieved by concentrating deterrence efforts on those groups or individuals involved directly in the targeted type of crime. Rather than enact broad-sweeping policies that indiscriminately apply across populations and places, focused deterrence efforts honor traditional deterrence principles while leveraging existing policies and practices in innovative ways directly toward small offending populations. The Chicago VRS program based its deterrence principles on those pioneered in the Boston Operation Ceasefire efforts of the 1990s, which was designed to reach out directly to gangs involved in ongoing shootings, saying that gun violence would no longer be tolerated, and then following through on such actions by “pulling every lever” legally available when gun violence occurred (Braga et al., 2001; Kennedy, 2011).

Chicago (Papachristos et al., 2007); Los Angeles (Tita, Riley, and Greenwood, 2003); Indianapolis, Indiana (Corsaro and McGarrell, 2009; McGarrell and Chermak, 2003); High Point (Corsaro, Hunt, Hipple, and McGarrell, 2012); and other cities (Braga, McDevitt, and Pierce, 2006; Engel et al., 2013) that have replicated some version of the original Boston Ceasefire approach typically deliver a deterrence message to individuals or groups

through “call-in” or notification meetings. To summarize, these meetings are the vehicle for transmitting the message. Although specifics vary within each program, usually a brief meeting is held between a group of targeted offenders and a collective of law enforcement officials, community representatives, and social service providers. Some programs stress the enforcement side of the message, whereas others balance the deterrence message with a strong “moral voice” and service provider element that hopes to provide choices and options that might help steer offenders along more prosocial paths (Crandall and Wong, 2012). Thus, in addition to “pulling every lever,” programs are also trying to provide possible alternatives that might aid the desistance process.

In addition to the message itself, specific attention is given to *how* the message is delivered. In particular, the Project Safe Neighborhood (PSN) initiative in Chicago tried to balance the focused deterrence message with principles of procedural justice and legitimacy under the guiding principle that a deterrence message will be better received if the *process* of delivering the message is fair and the actors delivering the message are perceived as acting justly (Papachristos et al., 2007). Chicago PSN designed the architecture of its focused deterrence-style meetings explicitly to embody such principles by (a) holding the meetings in a place of civic importance, such as a park, school, or local community institution, as opposed to a criminal justice facility; (b) organizing the meeting room in either a round-table format or a small classroom, as opposed to a court room or large lecture hall; and (c) scripting the actual language of the meeting to balance the enforcement, community, and service aspects.

A report issued by the National Academy of Sciences found the accumulation of evaluation evidence on the focused deterrence approach “compelling” (Wellford, Pepper, and Petrie, 2005: 10); moreover, this evidence seems to exert “very positive” effects in reducing gun-related crime and violence (Braga and Weisburd, 2012: 347). Recently, Braga and Weisburd (2012) conducted a meta-analysis of all focused deterrence programs using a quasi-experimental evaluation design and found demonstrable program effects in 10 of the 11 programs. Although additional evaluation research is clearly needed—especially those with more fully developed experimental and quasi-experimental designs—many of the programs cited in Braga and Weisburd’s meta-analysis posted double-digit declines in crime. For example, the original Boston Ceasefire calculated a 65% overall reduction in youth homicides, 25% reduction in gun assaults, and 32% reduction in 9-1-1 calls for shots fired during the observation period (Braga et al., 2001). An Indianapolis program witnessed a 34% reduction in citywide homicide rates compared with six other Midwestern cities (McGarrell, Chermak, Wilson, and Corsaro, 2006). Operation “Peacekeeper” in Stockton, California, experienced a 42% reduction in gun homicides compared with eight other cities in California with similar populations (Braga, 2008). An evaluation of Cincinnati’s Initiative to Reduce Violence was credited with a 35% reduction in gang member involved shootings compared with trends in non-gang-member-involved shootings (Engel et al., 2013). Total homicides in Chicago’s PSN target communities, in which repeat gun offenders

returning from prison were selected randomly to attend a notification meeting, decreased 37% compared with a set of comparison neighborhoods in Chicago (Papachristos et al., 2007). A quasi-experimental evaluation of the retooled Boston Ceasefire by Braga and colleagues (2013) found a 31% reduction in total shooting involvement of those gangs that were the focus of the program compared with a matched control group.²

Intervention

Guided by the principle that reducing gun violence in Chicago entails bringing a “don’t shoot” message to those involved in the street dynamics currently driving shootings, the Chicago VRS team faced the daunting questions raised by (some) opponents of the program: How would these principles translate into the vast gang situation in present-day Chicago?

The intervention would remain true to the form embodied in Boston and other locations, but the content (and context) of the message was tailored to Chicago’s unique gang landscape. Given the sheer size of both the city of Chicago and its gang problem, the intervention would have to be even more focused than previous efforts. The intervention itself would take the form of a call-in in which a collaborative group of law enforcement officials from the state, local, and federal levels; community stakeholders; and service providers would convey the message.³ The VRS effort was to be led by a group of non-law-enforcement professionals affiliated with the John Jay College of Criminal Justice’s National Network for Safe Communities, whose job it was to (a) work with police, researchers, and other gang experts to analyze current shooting patterns; (b) organize call-ins in a timely fashion, including inviting individuals as attendees; (c) follow up with various service providers and police; and (d) coordinate the various stakeholders in their VRS-related activities, including participation at the call-ins.

The call-ins followed the model described previously: one-hour-long meetings with groups of approximately 15 to 20 individuals affiliated with gang factions currently involved in (as either victim or offender) shootings. True to the legitimacy and procedural justice elements of the program, the VRS team elected to hold such meetings in a place of civic importance, such as a park, library, nonprofit organization, or school, rather than in a police station or courthouse. The VRS team strongly believes that the *setting* of the message relays important information: Despite any individual’s label or status as a gang member, the VRS team acknowledges that the attendees are members of the community and will be treated as such unless they choose to pick up a gun to settle a dispute. Part of the design of the

2. Several of these evaluations suggested that the observed effects of such strategies vary by the timing of the intervention as well as by the dosage of treatment calling for the heightened importance of quasi-experimental designs such as the one used in the present study (Braga et al., 2013; Corsaro et al., 2012).
3. See Crandall and Wong (2012) for a discussion of the structure of such call-ins and the process for such coalition building.

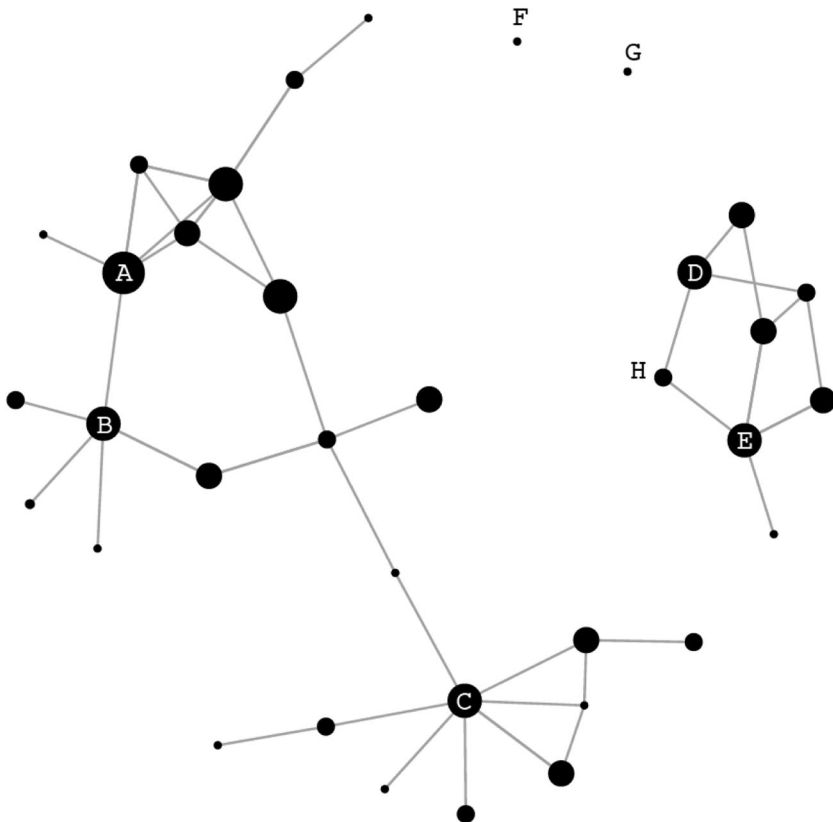
program was to enhance the legitimacy of such programs precisely by changing where the meetings were held and how the message was delivered.

The structure of the message followed past programs and is divided into three explicit sections: the enforcement component, the community moral voice, and the social service component. The meeting is moderated by a VRS staff member who acts as a sort of coach or moderator of the event. As a non-enforcement member, the moderator makes the transitions between the segments; this individual repeats and stresses key points, and he or she ensures that everyone stays on task. The VRS moderator begins the meeting with a call to order, ensuring everyone they will go home at the end of the hour. For example, at the beginning of one call-in, the moderator said: "This isn't a trick. Everyone gets to go home tonight. So relax a bit. We're here to talk to you about one thing: gun violence. No tricks. Just some straight talk, and an offer to help." The moderator goes on to explain why those specific people are in their respective seats—i.e., that they are somehow connected to a network of factions (or affiliated with such factions) that have been involved in recent shootings. They are at the call-in meeting as representatives of those factions or because they are "influential" in the faction networks. The moderator then shows attendees a picture of such networks (such as in Figure 3) to give the attendees a sense of just how much those in the room know of the ongoing disputes.

At this point, the call-in switches to the enforcement component and representatives from local, state, and federal law enforcement each take a turn explaining how their respective agency might be deployed against the various factions in the event of the next shooting. A federal partner, typically from the U.S. Attorney's Office, explains how federal statutes might be leveraged against the faction, including continued criminal enterprise and armed career criminal statutes. The point of this message stresses the deterrent aspect of the program. Representatives from local police and prosecutors provide examples of recent cases and shootings to underscore the reach of the current violence and how they are working in a coordinated fashion with others in the room. All stress that gun cases in the area are getting their full attention.

After the enforcement component, the VRS moderator introduces representatives from the community, often family members of those killed or harmed by gun violence or other local activists and community members or organizations. This segment is typically the most emotional; community actors retell their experiences around the loss of a loved one and the damage gun violence causes families and the community. A mixture of anger, pain, and frustration are bundled with a sense of hope as the community members close their segment with a notion of forgiveness, understanding, and love. At one call-in in 2010, a mother who had lost her 17-year-old son concluded by saying:

I'm angry as hell. But you know what? I love you. I love all you. You are the men of our community. We want you here, not in jail or in the ground. We know what's inside of you. You might not always think about what you're doing, but

FIGURE 3**Example Faction Conflict Network Derived from Gang Audit**

we know you. These people [pointing to others in the room]. They here to help you. Didn't no one try to help [my boy.] You better listen up: Because they here trying to save you too. We all are.

After the community representative finishes, the VRS moderator again takes the lead and stresses the “don’t shoot” message. The final segment of the call-in centers on making good choices as the moderator reinforces that people—ex-offenders and gang members like those sitting in attendance—have put down their guns and turned things around. “If you want help, it’s here for you” is a reoccurring theme as the moderator introduces a series of service providers in the room who go on to discuss their respective organization’s goals and services. Services include a range of health, mental health, housing, drug treatment, education, and employment services, all of which are made available to those in attendance free of charge. VRS staff offer to coordinate these services for anyone in the room who

wants them, and case workers are available to help individuals tailor service plans to their needs and follow up with them after the meeting.

At the end of the forum, the moderator thanks everyone in the room, stresses that people “really think on what they heard,” and insists that they “spread the word” among those in their respective factions. Importantly, those present are continually reminded to “take the message back” to their groups and factions. When the meeting ends, many in the room make a beeline for the exit. But some participants linger, staring at their feet and waiting to make contact with a call-in speaker or service provider. According to VRS staff members, more than 50% of attendees take advantage of services in one way or another.

Looking for Gang Factions

The basic structure of the VRS meeting, its message, and its general architecture have much in common with many of the prior focused deterrence- and legitimacy-based efforts reviewed in a previous section. One of the most striking innovations of Chicago's VRS, however, was its desire to leverage data on gang factions and current episodes of violence to select attendees for the call-in. The overarching goal was to leverage all possible data to understand the current street dynamics of Chicago gangs described in the previous section in order to identify those factions actively involved in shootings. For this purpose, the VRS teamed turned to a process referred to as a *gang audit*.

During the past decade, a technique known as a *group or gang audit* has been developed as part of focused deterrence-style programs with the explicit goal of extracting on-the-ground or experiential knowledge out of the heads of gang experts (such as case workers, police, and program officers) to analyze current shooting patterns; specifically, Which groups are involved in current shootings? Where do they hang out? What are the motives behind the shootings (Kennedy, Braga, and Piehl, 1997; Sierra-Arevalo and Papachristos, 2015)? The audit process is, essentially, a focus-group-style process led by the VRS team and researchers. The typical audit process begins with a large map of a specified geographic area. The researchers lead the group through an exercise with the following goals: (a) identifying all gang factions that exist or operate in the specified geographic area; (b) gathering information on the membership of said factions and their (illegal) activities; (c) locating important gang-related locations, pieces of turf, or activity centers; and (d) mapping interfaction relationships—i.e., alliances, disputes, mergers, fracturing, and so on. The researchers record and code the responses for subsequent analysis but allow the experts to work out details of specific gangs as a group. The VRS team and researchers probe with clarifying questions, asking about specific relationships and events to complete a series of preidentified questions aimed at gathering information in the four previously mentioned domains.

One key objective of the audit process is to create a social network map of the “gang landscape”—the patterns of conflict and violence among gangs in the specified geographic area (Kennedy et al., 1997; Sierra-Arevalo and Papachristos, 2015). An example of such a

map of gang conflict for one Chicago community is shown in Figure 3, where each node represents a unique gang faction and each tie represents a unique dispute or conflict as identified in the audit process. The size of the node reflects each faction's nodal degree; in this case, it is the total number of current conflicts in which the gang is involved.

Figure 3 displays the patterns of conflict among the population of gangs for one of the city's 25 police districts (estimated population of 105,000 residents in 2010). The audit process uncovered 35 active gang factions in the district, where "active" means a faction was involved in some kind of illegal activity. The audit process uncovered 50 active disputes or feuds between factions represented by the edges or lines in Figure 3. Many of the officers and experts involved in the audit are familiar with specific factions and feuds—indeed, many are tasked with the precise goal of knowing everything there is to know about a particular faction. What the audit process reveals is how the *population* of gangs is connected. For instance, most individuals in the audit identified the dispute between factions A and B, but they might have been pressed to determine how that single conflict is, in fact, nested in a much larger network of faction disputes. Second, the audit process also reveals how gangs can be *indirectly* connected. Gangs D and E, for instance, share a common enemy in gang H. This sort of shared animosity drives alliance formation under the old adage of "the enemy of my enemy is my friend"—known in network terms as "transitivity" (Chase, 1980).

Gang audits were conducted citywide starting in fall 2009. The initial VRS program, however, began slowly in one police district, expanding only thereafter to other high-crime districts. The VRS program uses such audit data to focus its gaze—and its message—on those groups most active in violence within the targeted districts. Although no precise algorithm or computational method is used to select target factions, the VRS team chooses to direct its efforts at groups actively involved in conflicts as opposed to those who are not actively involved in gun violence. The underlying principle is to reach those factions that are involved in shootings, rather than simply reaching out to gang members writ large. The audit provides an initial step toward sharpening the program's focus: by identifying those factions currently involved in shootings.

Importantly, the audit process does not end with such network maps. Rather, the process is *iterative* with information going back and forth among analyst, police, and program staff. For instance, after identifying potential factions who might be part of the intervention, the VRS team crosschecks its information with police detectives, line staff, and even community contacts to ensure their portrait of the current street dynamic is as accurate as possible.

Once the identity of the participating factions has been established, the VRS team must identify individual members or associates of each faction who will serve as the group's representatives at the call-in. This, too, is done in an iterative manner that begins with names of members derived from the audit process that is then cross-checked against additional police data and intelligence. The goal is to select influential individuals, by which the VRS team means those faction members or affiliates who have some standing in the group

and are likely to bring the call-in message back to other group or network members. Many individuals in the gang network are well known to police, parole, and probation officers, and the VRS team goes through a vetting process to ensure they are generating potential candidates who fit this criteria. Once the VRS team has whittled down the list to approximately 40 individuals, the names are again cross-checked to make sure candidates are not currently in prison, under investigation, deceased, or acting as a confidential informant. Finally, the VRS team reaches out to probation and parole officers to help recruit candidates to participate in the meeting. Each selected individual receives a customized letter explaining the goals of VRS and a visit or call from their probation or parole officer inviting them to a call-in on a specified date and time. Probation and parole officers, as well as VRS staff, follow up with each invitee prior to the call-in to maximize participation.

Research Design

Between August 17, 2010 and December 31, 2013, a total of 18 call-in meetings were held in Chicago; 149 gang factions (of 858 recognized factions in the city) had at least one member attend one of these call-ins with a total of 438 unique individuals having ever attended a call-in during this period. Because the program focused on specific gang factions and began in a limited number of police districts, it is not intended to decrease shooting behavior among *all* gang factions in the city—only those targeted by the intervention. This targeted nature of VRS affords a unique opportunity to test the efficacy of the VRS strategy and, perhaps, the larger theory behind it. The fact that VRS focused on only 17% of all gang factions leaves a large pool of potential comparison and control groups, especially in nontreatment districts. Thus, it affords a unique opportunity to develop a quasi-experimental research design.⁴ Our study uses propensity score matching to compare the shooting behaviors of those gang factions who were part of the VRS program with factions that are similar on important characteristics but that were not part of the VRS program. In the current study, we compare the shooting behaviors of “treated” gang factions (as either victim or perpetrator) in the 12 months after call-in attendance with the shooting behavior of matched controls during the same 12-month time period. A programmatic effect would be attributable to a decrease in shooting behavior of the VRS target gang factions relative to the comparison or control gang factions. A null finding or an increase in shooting behavior would suggest evidence against a VRS program effect.

Data

Data in this study came from three sources made available by the Chicago Police Department:

4. In this way, the greater number of gang factions in Chicago allowed us to overcome one limitation experienced by Braga et al. (2013) in matching gangs in Boston. While both studies achieve comparable matching of groups, our design was able to match based on a larger number of possible groups.

TABLE 1

Covariates Used in Propensity Score Matching

Aggravated Assault Arrests	Number of Faction Arrests for Aggravated Assault	N
Amount of turf controlled	Turf area in square feet	140
Average degree	Average degree (co-arrest) among faction members	149
Average path length	Average path length of all present paths	149
Chicago Police Department area 1	Gang faction located in central police area	141
Chicago Police Department area 2	Gang faction located in south police area	141
Chicago Police Department area 3	Gang faction located in north police area	141
Diameter of network	Longest geodesic distance	149
Drug arrests	Number of faction arrests for drug offenses	149
Faction—level of organization	Level of faction organization (low, medium, high), as determined by CPD	141
Faction—level of violence	Qualitative level of violence estimated by CPD (low, medium, high)	141
Faction size	The estimated number of members of the faction, as determined by CPD	130
Median age of faction members	Median age of members	149
Number of components in network	Number of components in faction-level co-arrest network	149
Other felony arrests	Number of faction arrests for other felonies	149
Racial composition of faction	Racial composition where "race" = > 66% of a given race	149
Robbery arrests	Number of faction arrests for robberies	149
Shootings - 2006 to 2010	Number of faction shootings (victim or suspect) between 2006 and 2010	149
Size of largest component	Size of largest component	149
Total number of active alliances	Total number of "active" alliances	141
Total number of active conflicts	Total number of "active" conflicts	141

Note. CPD = Chicago Police Department.

- (1) Incident-level records of all arrests in Chicago
- (2) Homicide and nonfatal shooting records
- (3) Additional faction information collected during gang audits

All of these data cover the period from January 1, 2006 to March 31, 2014. The unit of analysis is the *gang faction*; as described previously, the gang faction is believed to be the smallest and most meaningful action unit for gang members. Between 2009 and 2010, the VRS team and the Chicago Police Department completed citywide audits of gangs in each of the 22 (at the time 25) police districts covering the population of gang factions within each district, information on conflicts and alliances among these factions, and qualitative and quantitative information on each faction. These data were updated on a regular basis by each local police district, and factions were selected for VRS based on the most recently available data.

After identifying all unique factions, we created a faction-level database containing as much information about each faction as possible from the available data, including demographic, organizational, network, and crime involvement information (see Table 1). From the gang audit information, we created variables on each faction's overall "level of

organization" (low, medium, and high) and perceived "level of violence" (low, medium, and high). *Membership size* was also estimated during the audit process and included in our models by asking audit participants of the approximate size of the group and then arriving at some general consensus. Finally, and directly related to Figure 3 and one of the core selection mechanisms for VRS treatment, we created variables for the total number of conflicts and alliances of any faction with other factions in the data (Braga et al., 2013). Conflicts were coded when there were identified or known tensions, but especially shootings, among groups; alliances indicate relations marked by consensual criminal ventures or else had a formal alliance.

In addition to gang information from the audits, we calculated the general criminal activity of factions as aggregated from arrest records. For each faction, we aggregated the total number of arrests for aggravated assault, drug-related crimes, robberies, and all other felonies committed by members of each faction. Likewise, we created a *shooting* variable that counts the number of fatal and nonfatal shootings of each faction's members (as either victim or offender) in the 5 years preceding VRS—in essence, the "pretest" level of shooting involvement.⁵ Matching on this measure is crucial as our goal is to compare factions otherwise equal to each other on prior levels of shooting involvement to determine whether VRS participation yielded significant posttreatment differences in shooting involvement.

Given the specific use of network analysis to determine treatment factions, we also include several variables about each gang's internal network. For each faction, we created unique gang networks based on the two-degree ego-network for members of each faction. This process began with all of the known members (defined by the police) for each faction and, in essence, snowballed out from these seeds extracting all co-offenders listed in all available police records. We then repeated this to get all the associates' associates. Although by no means a perfect means of determining a gang's true network structure, a growing body of research has found that such co-offending networks provide important insight into the criminal activity of gangs (Grund and Densley, 2014), especially gun violence more broadly (Papachristos et al., 2015). Importantly, these faction co-offending networks represent the co-offending patterns of the faction as opposed to some larger organizational or leadership structure.

To account for the extent that gang network and organizational structure—as well as the variability in said structures—might affect shooting behaviors (Decker, 1996; Decker, Katz, and Webb, 2007), we created several variables pertaining to the organizational or network structure for each gang. In particular, we selected several important structural variables that describe the extent to which each faction is connected and how its patterns of connection might potentially influence the diffusion of the VRS message. These variables are as follows:

5. For the matched controls, the 5-year window of shooting behavior encompasses the 5 years leading up to the call-in attendance date of the treated faction to which it is matched.

- (1) The *average degree*, or number of, co-offending ties among all known network members. In network analysis, nodal degree can measure (and be interpreted as) many things (Wasserman and Faust, 1994). In our analysis, degree measures each node's number of unique co-offenders. The average degree, then, measures the distribution of unique co-offenders across each faction-network—i.e., on average, how many co-offenders any member of a faction has (whether the co-offender is a member of the faction). A high average degree suggests that members of a faction are tied to a greater number of unique offenders than a faction with a lower average degree.
- (2) The *average shortest path length* (or mean geodesic) among all faction-network members. The geodesic is the shortest distance between any two nodes in a network (Wasserman and Faust, 1994). In networks with more than two people and more than two ties, there are multiple paths between pairs of nodes and the geodesic is the shortest of these paths. Members in faction networks with shorter path distances are “closer” to each other, on average; as such, information—like the VRS message—might diffuse more quickly within factions with low geodesics.
- (3) The *diameter* of a network refers to the *longest* path between any two nodes in a faction network. Broadly, diameter is a definition of network *size*: A larger diameter means that there is a greater distance between the two nodes on that diameter (Wasserman and Faust, 1994).
- (4) The *number of components*. A component is a completely connected subgraph within a network—a graph in which members of one component can all reach each other but cannot reach nodes outside of the component. In Figure 3, for instance, there are four components: the largest component, which includes members A and B, and a smaller component with members D and E. Components F and G are each (technically) their own component. Faction networks with multiple components might be indicative of more splintering within each faction, the presence of smaller operational groups, or greater network size and variability.

The importance of geographic space for gangs—especially gang turf or set-space—is well known (Brantingham, Tita, Short, and Reid 2012; Papachristos, Hureau, and Braga, 2013; Tita, Cohen, and Engberg, 2005). As such, our propensity score models included two geographic variables. First, based on Chicago Police Department maps of gang turf, we calculated the total gang turf controlled by a faction (in square feet). Multiple pieces of turf or larger pieces of turf might be indicative of larger organizational capacity, not to mention potentially more geographic points of conflicts (Brantingham et al., 2012). Second, we include three dummy variables for the general “police area” in the city, with the idea that we want to match treated factions to control factions from the same general section of the city. Broadly, police areas cover wide swaths of geopolitical districts where area 1 represents (roughly) the city's west side (home to gangs like the Vice Lords) and communities near the central business district, area 2 represents the south side (birthplace of gangs like the

Gangster Disciples and the Black P. Stone Nation), and area 3 represents the north side (a more diverse part of gangland).

Finally, our dependent variable is the frequency of shooting involvement of each faction in the 12 months *after* a call-in, where faction involvement is defined by the known gang affiliation of the victim or perpetrator. We calculated separate variables for total shooting involvement, victimization, and offending. Whereas our main interest is in the frequency of shooting involvement, we also conducted a supplementary analysis of the time to the first shooting using a survival model. For this analysis, our dependent variable is the number of weeks from the call-in date until the first shooting involvement of a faction (or the last date of our data collection—March 31, 2014—for those factions that were not involved in a shooting).

Propensity Score Matching

To summarize, we use propensity score matching to create a quasi-experimental condition to estimate the effect of call-in attendance on the frequency of shootings in which a gang faction was involved during the 12 months immediately after the call-in. One prime source of lack of comparability and equivalence between treatment and control groups—in the case here, between gang factions that had one or more members attend a call-in (i.e., the treatment) and those factions not represented at any call-in—is imbalance. *Imbalance* between the treatment and control groups occurs if there are differences in the pretreatment characteristics of each group. It becomes a problem if there are differences in confounding factors—i.e., characteristics of gang factions that are related to both the likelihood of call-in attendance *and* shooting behaviors. If treatment and control groups are imbalanced, then a comparison of the prevalence of shootings across groups will not yield a valid estimate of the effect of call-in attendance—some other difference between the gang factions *besides call-in attendance* may account for outcome differences.

To resolve any issues of imbalance, we statistically adjust for differences between factions through propensity score matching (Morgan and Harding, 2006; Morgan and Winship, 2007). The propensity score is defined as the probability that a certain faction receives the treatment (i.e., attends a call-in) given all that we observe about the faction. It is a summary measure of the characteristics could confound our ability to estimate the effect of call-in attendance on subsequent shootings. In the present study, we estimate the propensity of call-in attendance for each gang faction in Chicago using a logit model. We use 23 different covariates, which are described and summarized in Table 2, as predictors of call-in attendance. Covariates include prior involvement in violence.

As noted in Table 1, we have missing data on several of our predictors. Accordingly, before creating propensity scores, we used the *mi* commands in Stata (Stata Corp, College Station, TX) to implement the multiple imputation by chained equation algorithm to create five imputed data sets. We then followed Hill's (2004: 13) multiple-imputation matching strategy and calculated a propensity score for each observation in each of the imputed data

T A B L E 2

Covariate Balance Before and After Matching

Covariates	Raw Means		Differences in Means		Percentage Reduction in Absolute Bias	Postmatch Hypothesis Test	
	VRS	Non-VRS	Unadjusted	Postmatch		t Statistic	p Value
Amount of Turf Controlled (sq. ft.)	3,300,000	2,800,000	500,000	0.00	98.3	-0.01	.989
Arrests							
Aggravated assault arrests	1.34	0.85	0.49	-0.30	37.3	-1.32	.189
Drug arrests	6.30	2.08	4.21	-0.99	76.6	-0.86	.391
Robbery arrests	0.49	0.30	0.19	-0.03	83.7	-0.23	.817
Other felony arrests	5.18	2.22	2.96	-0.36	87.9	-0.44	.659
Network Characteristics							
Average degree	2.13	1.95	0.19	-0.01	95.8	-0.18	.856
Average path length	4.09	2.96	1.13	-0.17	85.4	-0.72	.470
Diameter of network	9.66	6.08	3.59	-0.68	81.0	-1.05	.295
Number of components in network	10.06	5.36	4.70	-1.27	73.0	-1.06	.289
Chicago Police Department Area							
Area 2 (vs. 1)	0.35	0.31	0.04	0.02	55.2	0.28	.777
Area 3 (vs. 1)	0.51	0.23	0.29	0.09	67.9	1.40	.164

(Continued)

T A B L E 2

Continued

Covariates	Raw Means		Differences in Means		Percentage Reduction in Absolute Bias	Postmatch Hypothesis Test	
	VRS	Non-VRS	Unadjusted	Postmatch		t Statistic	p Value
Faction—Level of Organization							
Low (vs. high)	0.15	0.24	−0.09	0.02	79.1	0.39	.696
Medium (vs. high)	0.37	0.38	−0.01	0.00	47.1	0.08	.940
Faction—Level of Violence							
Low (vs. high)	0.21	0.23	−0.02	0.01	56.3	0.18	.858
Medium (vs. high)	0.30	0.31	−0.01	0.09	−878.4	1.61	.108
Faction size	44.85	35.77	9.07	8.71	4.0	1.16	.246
Median age of faction members	21.34	22.23	−0.89	−0.10	89.1	−0.22	.828
Racial Composition of Faction							
Black	0.76	0.47	0.29	0.00	98.5	−0.09	.928
Hispanic	0.13	0.21	−0.08	−0.01	91.1	−0.17	.867
Mixed race	0.05	0.25	−0.19	−0.01	96.5	−0.25	.804
Shootings—2006 to 2010	3.85	2.11	1.74	−0.96	45.2	−1.63	.105
Total number of active alliances	2.39	4.24	−1.85	−0.10	94.7	−0.22	.822
Total number of active conflicts	3.02	5.72	−2.70	−0.16	94.0	−0.30	.767

Note: $N = 576$. Model specifications: three-to-one matching with a caliper of 0.05.

sets by using the *mi estimate* and *mi predict* commands in Stata. We then averaged the propensity scores for each respondent across the five imputed data sets.⁶

After estimating the propensity score, we matched each treated faction (i.e., attended a call-in) with up to three control factions (i.e., did not attend a call-in) with very similar propensity scores to produce treatment and control groups that are indistinguishable except for the receipt of treatment conditioning on propensity scores.⁷ In this case, we used a caliper of 0.05, where caliper refers to a maximum tolerance of distances between propensity scores of the treated and control factions. In our matching procedure, we use matching with replacement—that is, each control faction can be matched to more than one treated faction. Matching with replacement generally increases the quality of matches (i.e., reduces bias), and it increases the variance of the estimate because fewer unique control observations are used to construct counterfactuals (Morgan and Winship, 2007; Smith and Todd, 2005). Matched observations will not necessarily be similar on each covariate, but they will be similar, on average, across all the covariates used to estimate the propensity of call-in attendance.

In total, we matched 148 of the 149 treated factions to at least one control observation. One faction had a propensity of call-in attendance that was not within a .05 probability of any of the nontreated factions, and therefore it was not matched with any control cases. In total we use 428 matched controls; because we matched with replacement and some controls were matched to more than one treated faction, the 428 control matches include 211 unique control factions.

After matching treated and control cases, we determined whether our matching procedure produced balance across the groups on observed covariates. This was done by assessing the percentage reduction in absolute bias and the mean differences across groups for each covariate after adjusting for propensity scores. Bias represents the mean differences across groups as a percentage of the square root of the average of the sample variances:

$$100 \times (\bar{x}_T - \bar{x}_C) / s_T^2 + s_C^2)^{\frac{1}{2}}$$

6. We also estimated our analyses using listwise deletion for cases with missing values on any of the 23 covariates and include results based on this sample in Figure A1. We used the same matching specification for the analysis in the main body of the article with the imputed data and in the Appendix with the listwise deletion data (i.e., three-to-one matching with replacement and a caliper of 0.05). The results based on the imputed data presented in the main body are more conservative than the results in the Appendix; yet both analyses reveal that call-in attendance yielded at least a marginally significant reduction in the likelihood of all shootings (victimization and offending), and a highly significant reduction in victimizations.
7. We explored the robustness of our results to the specification of our propensity score model by varying the size of the caliper (0.01 to 0.05, by an increment of 0.005), the number of matches (one versus three), and estimation method (nearest neighbor versus kernel matching with bandwidths of 0.02, 0.06, and 0.10). Our chosen specification of nearest-neighbor matching with a caliper of 0.05 and up to three matches per treated case achieved the lowest level of median bias relative to other model specifications.

where \bar{x}_T and \bar{x}_C are the sample means in the treated group and the control group, respectively, and s_T^2 and s_C^2 are the respective sample variances (Rosenbaum and Rubin, 1985).

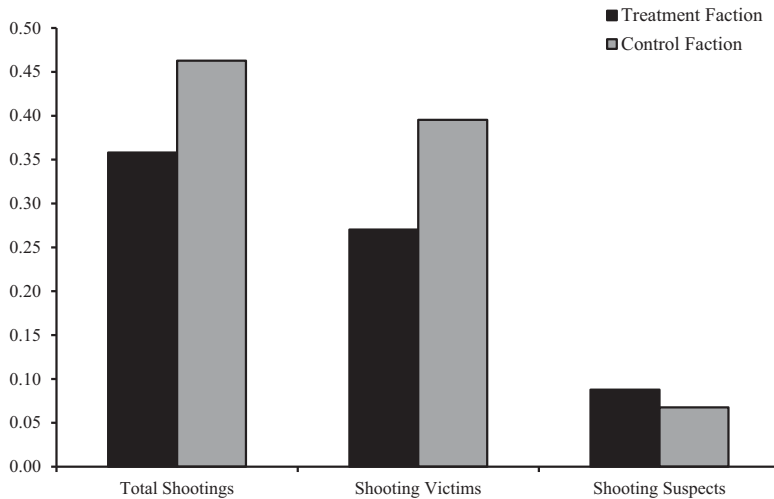
Results

Table 2 provides a comparison of treated and control factions across a variety of characteristics before and after matching on propensity score. Focusing on the unadjusted prematch differences, the comparison reveals that members of VRS factions were more frequently arrested for aggravated assaults, drug crimes, robberies, and other types of felonies than non-VRS faction members. Compared with control factions, the VRS factions are also characterized by a greater degree, path length, diameter, and number of components than non-VRS factions. Taken together, this means that the VRS factions were, on average, larger networks with a greater number of components relative to non-VRS factions. This was not necessarily an intention of selection, but it might be the fact that groups with larger networks or greater network diversity (i.e., greater number of components) are more involved in shootings. VRS factions also tend to be located in Chicago Police Department police area 3 (north) with few VRS factions located in the central police area.⁸ In contrast, non-VRS factions are much more likely to be located centrally (area 1). In part, this is a function of program design: The program began in high-crime districts in one police area and then expanded slowly from that point. In terms of racial and ethnic composition, VRS factions were much more likely to be factions with predominately Black members and less likely to be predominately Latino factions; again, this is a result of initial program design given that the program began in predominantly Black communities. VRS factions tend to have significantly fewer alliances with other factions but also fewer conflicts.⁹ However, VRS factions were involved in significantly more shootings in the 5-year period from 2006 to 2010.

Table 2 thus reveals that treated and control factions differ on numerous characteristics. Ultimately, these differences could account for any observed differences in shootings across factions. Our objective is to ensure that the treated and control factions are statistically similar, on average, across all observable covariates. We do so by matching on the propensity score. After matching, the postmatch t statistics and corresponding p values in Table 2

8. For a map of Chicago Police Department police areas, districts, and beats, see the map from the Office of Emergency Management and Communications (2012).

9. This finding seems odd given the audit process's intention of identifying those gangs most involved in violence. Descriptively, this finding stems from two issues: (a) several Latino gangs that are involved in a large number of conflicts but are involved in a small number of shootings—i.e., these gangs have plenty of conflict, but they less often morph into episodes of gun violence—and (b) several large Black gangs on the south side of Chicago that became part of the program in 2014 after our observation period. The current analyses does not include gangs who attended call-in in 2014 as data were not yet available at the time of this writing.

FIGURE 4**Predicted Number of Fatal and Nonfatal Shootings in the Year After VRS Call-in Attendance, Propensity Matched Gang Factions**

demonstrate that among the 23 covariates used to estimate the propensity score, not one significant difference emerged between the treated and controls in our final matched sample. Matching on propensity score reduced absolute bias across all covariates by 77% from a mean of 36.4 down to 8.4, as well as from a median of 33.1 to 3.8. Equivalence on observed characteristics is critical to our design, as it allows us to compare “apples to apples” when examining the effect of VRS attendance on subsequent shooting involvement.

Having established the effectiveness of our propensity score matching to produce statistically equivalent treatment and control groups, we turn now to the results of the effect of call-in attendance on shootings. Recall that our outcome variable, shootings, is a measure of the number of separate shootings faction members were involved in as either a victim or a known suspect in the 12 months after the date of the call-in. For matched control cases (i.e., that did not attend a call-in), we simply counted the number of shootings for a given faction between the call-in date and the 12 months after. The treated factions and the matched controls were involved in a total of 254 shootings in the 12 months after the call-in date.

The results in Figure 4 display the difference in mean number of shootings between the treatment and control factions 1 year after call-in attendance. The results show that call-in attendance yields a marginally significant reduction in the likelihood of subsequent faction shootings. On average, factions attending a call-in were involved in 0.36 shootings in the year after the call-in, whereas control factions (i.e., those that did not attend a call-in) were

involved in 0.46 shootings. This difference of 0.10 shootings equates to a 23% reduction in shootings after attending a call-in ($Z = -1.28$; p value = .100, one-tailed test). Put differently, if at least one faction member attends a VRS call-in, then that faction will be involved in 23% fewer shootings in the year after the call-in than if no faction member had attended a call-in.¹⁰

Of the 254 shootings involving a treated or control faction, in 211, a faction member was the victim, and in 43, a faction member was a known suspect. The relative imbalance in victimization versus offending reflects the fact that the perpetrators of many shootings are unknown.¹¹ As such, although we may be limited in the extent to which we can conclusively tell whether call-in attendance led to a decline in offending, we can be more confident in victimizations.

Figure 4 also presents analyses disaggregated by victimizations and offending. These results indicate that call-in attendance significantly and substantially reduced the likelihood of shooting victimizations ($Z = -1.78$; p value = .038, one-tailed test). VRS attendance equates to a 0.13 reduction in the number of shooting victimizations in the year after call-in attendance. In percentage terms, call-in attendance yielded a 32% reduction in the likelihood of nonfatal and fatal victimization in the year after the call-in date. VRS had no observable effect on known offending ($Z = 0.60$; p value = .274, one-tailed test). Again, many perpetrators of gun violence are unknown to the police. Moreover, given heightened scrutiny of those gang factions participating in VRS, we might even expect that for treatment and control factions committing the same number of shootings (as an offender), that the treatment (i.e., VRS) faction would be more likely to be arrested for the involvement. Hence, the fact that there is no statistical difference in the perpetration of gun violence (i.e., offending) between the VRS and non-VRS factions suggests that, at a minimum, VRS factions are no more likely to be perpetrators of shootings and may in fact be less likely.

Conclusion and Discussion

Four years after the first VRS call-in raised concern in the media and drew the ire of some politicians, ex-gang leaders, and community activists, our study finds evidence of a promising gun violence reduction effect among those gang factions who participated in the program. Our quasi-experimental analyses that matched treatment and control

10. As a supplementary analysis, we also analyzed the time to failure (i.e., time until a faction-involved shooting) using propensity score weights in a Cox proportional hazards model. The results from this survival analysis reveal a significant, negative relationship between VRS attendance and the hazard of shooting involvement (coefficient = -0.393 ; $Z = -2.04$; hazard ratio = 0.675). Consistent with our other results, those factions that participated in VRS were significantly less likely to be involved in a shooting than otherwise similar control factions and go a longer period of time until a shooting incident. Survival curves are shown in Figure A2.

11. For 2010, the Chicago Police Department reported a clearance rate of 33.9% for murders and 33.3% for all violent index crimes (Chicago Police Department, 2011). The percentages were comparable for 2009.

factions using propensity score matching techniques found a 23% reduction in total shooting behavior in treatment factions and a 32% reduction in gunshot victimization among members of treatment factions. No statistically significant effect was observed on offending patterns. Overall, our results provide evidence that the call-in style intervention of VRS that focuses its efforts on specific gang factions provides a promising strategy for targeted gun violence reduction strategies.

These findings build on prior research in at least three important ways. First, most prior research on call-in style programs has focused on *aggregate* neighborhood or city-level crime rates (for an exception, see Braga et al., 2013). In contrast, our study analyzed the actual unit of intervention—gang factions—and, more importantly, created a set of matched comparison groups. Second, our study is one of the first to differentiate between gun victimization and gun offending among the treated population (again, with the exception of Braga et al., 2013). Although our findings on offending are stymied by missing data on unknown offenders, the current results suggest that important differences may exist between faction-level victimization and offending patterns—something future research should consider. Finally, studying such programs in Chicago, one of the country's gang epicenters, represents one of the first attempts of applying and evaluating such a program in a city of such size, with a large population of gangs, and with a long and embedded history of gangs and gang violence.

Our study is not without limitations. First and foremost, despite our best efforts, it is possible that our propensity score modeling fails to capture unobserved nonrandom selection processes, especially the political processes for selecting the initial program areas and subsequent program expansion. Although Table 2 suggests that our models do an adequate job in eliminating faction-level differences between treatment and control groups, unobserved differences might influence our findings. Second, the lack of complete data on offending patterns might suggest that we are underestimating the overall shooting behavior of factions, although this would be true of both treatment and control factions.

A third limitation is the concurrency of VRS with other gun violence reduction strategies in Chicago. In particular, two other high-profile gun violence prevention programs—PSN and CureViolence—were in operation during our study period. Some overlap did exist between PSN and VRS treatment areas; however, PSN and VRS staff worked together to minimize the cross-contamination between the individuals involved in the respective programs.

CureViolence has operated in Chicago since 1999, and during this time, it has worked in more than a dozen high-crime communities (see Skogan, Hartnett, Bump, and Dubois, 2009). VRS and CureViolence share a common theoretical guiding principle in directing resources toward those gangs actively involved in gun violence. VRS does so through call-ins, whereas CureViolence uses outreach workers called “violence interrupters” (Skogan et al., 2009). The exact procedure through which CureViolence directs its violence interrupters is unknown; therefore, it is not possible to know whether individuals

were part of both CureViolence and VRS. In terms of geographic treatment area, CureViolence's programmatic area ebbed and flowed during our study period, making it difficult to ascertain programmatic cross-contamination. However, a recent evaluation of CureViolence suggests that VRS and CureViolence were not operating in the same areas during our VRS study period (Henry, Knoblauch, and Sigurvinsdottir, 2014). Thus, although programmatic overlap is still a possibility, we believe the effects would be minimal.

Limitations notwithstanding, our study provides consistent evidence that getting the right message to the right groups in a way that is timely, just, and fair can successfully reduce gun violence among the targeted factions. Programs such as VRS are by no means a cure-all for gun violence: They do not, for instance, improve schools, create jobs, reduce inequalities, or address other macrolevel community factors at the heart of gun violence. Yet, VRS-style programs just might provide a way to intervene in the street dynamics that drive gun violence in American cities. Furthermore, in stark contrast to policies and policing efforts such as "stop and frisk" or gang loitering laws that cast their nets broadly, VRS-style interventions achieve a dramatic crime reduction effect while subjecting smaller numbers of people and groups to criminal justice intervention. Taken together, the design of the program and its demonstrated efficacy might lend itself to similar focused efforts in the realm of educational, social work, violence interruption, and public health interventions.

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Appendix

The results in Figure A1 are based on the listwise deletion of cases with missing values. In this case, we delete a total of 20 treated gang factions of 149 total from the analysis. The results indicate that call-in attendance significantly and substantially reduced the likelihood of total shootings ($Z = -1.87$; p value = .031, one-tailed test) and victimizations specifically ($Z = -2.61$; p value = .005, one-tailed test). Call-in attendance had no apparent effect on known offending ($Z = 0.45$; p value = .326, one-tailed test). VRS attendance yielded a 0.16 reduction in the total number of shootings and a 0.18 reduction in victimizations in the year after call-in attendance. In percentage terms, these numbers equate to a 31% reduction in the likelihood of nonfatal and fatal shootings (victimizations or offending) and a 40% reduction in victimizations specifically.

FIGURE A1

Predicted Number of Fatal and Nonfatal Shootings in the Year After VRS Call-in Attendance, Propensity Matched Gang Factions (Nonimputed Data)

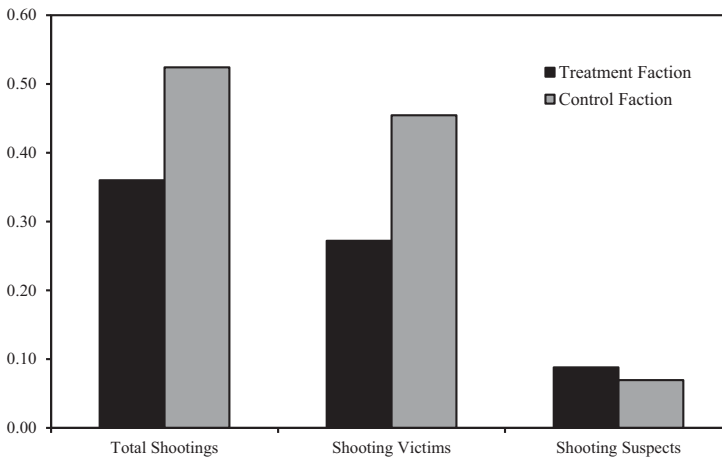


TABLE A 1

Top 30 Violent Crime Rates Across Major Metropolitan Areas (2012)

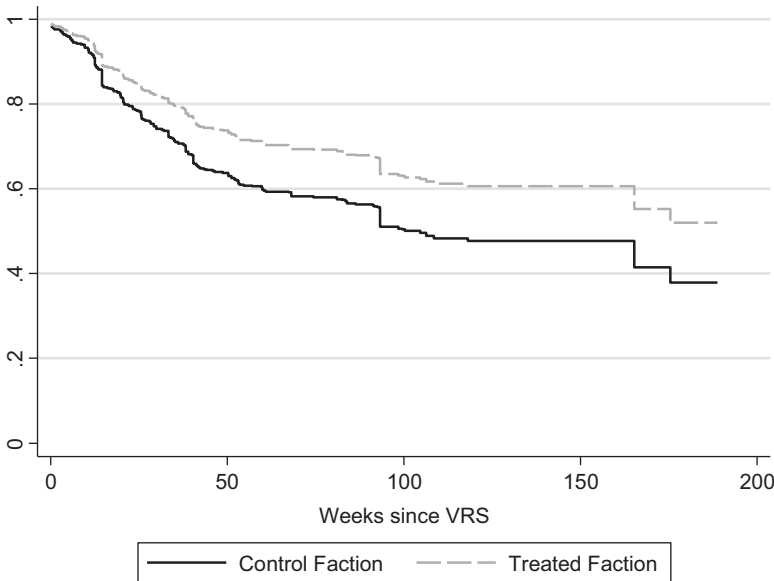
Ranking	Agency	State	2012
1	Detroit Police Department	MI	2,122.9
2	Oakland Police Department	CA	1,993.3
3	St. Louis Police Department	MO	1,776.5
4	Memphis Police Department	TN	1,750.3
5	Stockton Police Department	CA	1,548.0
6	Baltimore City Police Department	MD	1,405.2
7	Cleveland Police Department	OH	1,383.8
8	Atlanta Police Department	GA	1,379.0
9	Milwaukee Police Department	WI	1,294.5
10	Buffalo Police Department	NY	1,288.7
11	Kansas City Police Department	MO	1,263.2
12	Nashville-Davidson Metro Police Department	TN	1,216.0
13	Indianapolis Police Department	IN	1,185.5
14	Washington Metropolitan Police Department	DC	1,177.9
15	Miami Police Department	FL	1,172.0
16	Toledo Police Department	OH	1,171.9
17	Philadelphia Police Department	PA	1,160.1
18	Newark Police Department	NJ	1,154.5
19	Chicago Police Department	IL	1,045.2
20	Houston Police Department	TX	992.5
21	Minneapolis Police Department	MN	992.2
22	Tulsa Police Department	OK	990.0
23	Cincinnati Police Department	OH	974.7
24	Oklahoma City Police Department	OK	919.1
25	Boston Police Department	MA	835.0
26	Anchorage Police Department	AK	828.7
27	New Orleans Police Department	LA	815.2
28	Las Vegas Metropolitan Police Department	NV	784.0
29	Pittsburgh Police Department	PA	752.0
30	Albuquerque Police Department	NM	749.7

Note. These data were taken from the FBI Unified Crime Reporting Statistics (ucrdata.fbi.gov/index.cfm) data portal, listing the crime rate for Index Part 1 violent crimes per 100,000 residents for law enforcement agencies serving 250,000 people or more. As the Chicago Police Department does not report forcible rape according to UCR guidelines, we impute the violent crime rate for 2012 from our data at hand.

Andrew V. Papachristos is an associate professor of sociology at Yale University. His research applies the growing field of network science to understanding patterns of gunshot victimization in U.S. cities. Much of this work has focused on street gangs, illegal gun markets, and interpersonal violence. His recent writing has appeared in *The American Journal*

FIGURE A2

Estimated Survival Time Until a Fatal or Nonfatal Shooting, Cox Proportional Hazards Regression with Weighting by Propensity Score



of Sociology, *The American Sociological Review*, *The American Journal of Public Health*, *Social Science & Medicine*, and *The Journal of Quantitative Criminology*, among other outlets.

David S. Kirk is an associate professor of sociology and a professorial fellow of Nuffield College at the University of Oxford. His current research interests include neighborhood effects, prisoner reentry, and crime and the life course. One ongoing project involves an experimental housing mobility program for ex-prisoners. Kirk's recent research has appeared in *American Journal of Sociology*, *Sociology of Education*, and *Criminology*.