Firearm Homicide and Firearm Suicide: Opposite but Equal

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SYNOPSIS

Objective. Homicide and suicide are intentional acts of violence that disproportionately involve firearms. Much more effort has been devoted to the ecological study of homicide; methods that have been developed to better understand and subsequently prevent homicide may be applicable to suicide. The purpose of the present study was to compare the occurrence of firearm homicide and firearm suicide using routine activity theory as a framework for analysis.
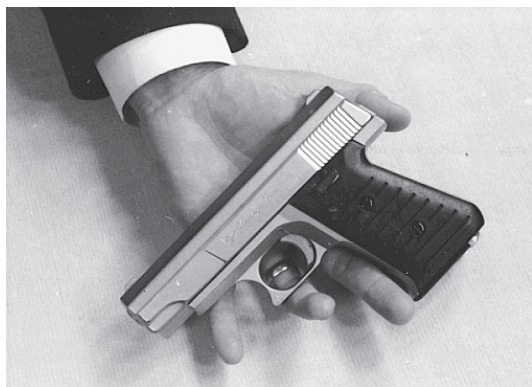
Methods. Detailed mortality data pertaining to decedents, their neighborhoods, and use of firearms were collected from 1994 to 1998 for the counties containing and surrounding three small to medium-sized U.S. cities. Data from a total of 468 neighborhoods that collectively experienced 1,025 intentional deaths from firearms (396 firearm homicides and 629 firearm suicides) were analyzed.

Results. Firearm homicide was consistently associated with out-of-home, nighttime activity in neighborhoods where many people were likely to be coming and going. In an opposite-but-equal fashion, firearm suicide was consistently associated with in-home, daytime activity in out-of-the-way neighborhoods.

Conclusions. Firearm homicide and firearm suicide were found to be consistently associated with markers of routine activity in all three cities, albeit in an opposite-but-equal manner. Because firearm suicides very often occur as lonely events in lonely neighborhoods, they may go under-noticed relative to firearm homicides. More awareness and additional public health studies of firearm suicide, in tandem with firearm homicide, should be pursued to better identify individuals and neighborhoods that are at greatest risk of experiencing each event.

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Homicide and suicide are intentional acts of violence that disproportionately involve firearms: from 1994 through 1998, 69% of homicides and 59% of suicides in the United States were committed with firearms.[1] Despite cursory similarities, several characteristics associated with homicide and suicide have been shown to clearly oppose one another.[2] Much more effort has been devoted to the ecological study of homicide; methods that have been developed to better understand and subsequently prevent homicide may be applicable to suicide.

Cited more than 500 times in the past two decades, Cohen and Felson's routine activity theory is a familiar method of interpreting and distinguishing situations that lend themselves to criminal violence.[3–5] This theory holds that violent crime results from the convergence of three elements: suitable targets, motivated offenders, and an absence of capable guardians. A suitable target is any person or thing (such as money) that may evoke criminal inclinations, a motivated offender is anyone with an inclination to commit a crime, and a capable guardian is a person who can protect a target. The lack of any one of these three elements is sufficient to prevent the occurrence of successful crime.[4,6–8]

Homicide, the prime example of criminal violence, has been studied using routine activity theory in several research efforts.[9–12] Suicide, while not criminal, is also a violent act that may be better understood through the use of routine activity theory. However, to the best of our knowledge, there has been no application of routine activity theory to the study of suicide.

In order to fill these gaps in knowledge, we compared the occurrence of firearm homicide and firearm suicide in and around three U.S. cities using routine activity theory as a framework for analysis. The relationships of firearm homicide and firearm suicide to various individual and neighborhood parameters were tested with the intent of learning more about the ecosocial nature of both events.

METHODS

Data collection and setting
We instituted a firearm injury reporting system (FIRS) for the counties containing and surrounding three cities: Allentown, Pennsylvania (Lehigh and Northampton Counties); Youngstown, Ohio (Mahoning and Trumbull Counties); and Cedar Rapids, Iowa (Benton, Cedar, Clinton, Des Moines, Henry, Iowa, Jackson, Jefferson, Johnson, Jones, Keokuk, Lee, Linn, Louisa, Muscatine, Poweshiek, Scott, Tama, Van Buren, and Washington Counties).[13]

County selection was based on data accessibility, population size, and proximity to major urban centers. We included both metropolitan and nonmetropolitan counties with populations ranging from 7,000 to nearly 300,000 residents. Because very large cities can heavily influence events in immediately adjacent smaller cities through various spillover effects, we were careful not to include counties that were geographically contiguous to major urban centers of one million population or more.

The FIRS was used to collect individual-level data pertaining to firearms, decedents, and their environments from state and county medical examiners' offices, local and regional police departments, and crime laboratories. We included all known cases of firearm homicide and firearm suicide for the five-year period 1994–1998. Eligible cases of firearm death were operationally defined as any intentional injury event caused by a weapon that uses a powder charge to fire a projectile. Because county medical examiners' and coroners' offices are responsible for investigating all sudden, violent, and suspicious deaths occurring in their areas, access to death certificate records housed by these officials was vital in identifying firearm homicides and suicides. Using death certificate data to ascertain firearm injury cases has been successful in similar efforts.[14–16] In addition, when individuals die from violent causes and their deaths are not immediately registered by morgues or law enforcement, the vast majority are found within a year's time following their deaths. This is most likely due to the difficult, if not impossible, nature of surreptitious human body disposal.[17–19] Therefore, the number of firearm homicides and suicides that were not found in the police, medical examiner, or coroner records at our three study sites should be negligible.

We obtained neighborhood data at the census tract level for each of the three study areas. Census tracts are small, geographic entities that contain 2,500 to 8,000 residents and have boundaries that do not cross county boundaries.[20] We accessed census tract data either directly from the Census Bureau database for 1990[21] or from Claritas, Inc. (San Diego, California) as imputed projections for 1995.[22] Claritas creates five-year census tract projections using decennial base population counts and post-census data from various sources.

We then linked information from the FIRS to these census tract data. Each firearm homicide and firearm suicide was assigned to its corresponding census tract based on the address where it occurred. We were unable to assign 1.5% of firearm homicides and 2.7% of firearm suicides due to missing data or imprecise addresses.

Analysis and modeling

We first calculated summary statistics for several decedent-level variables for each study site. These decedent-level summary statistics included percentages and rates per 100,000 individuals, which were compiled using 1996 Census population estimates[23] (1996 was the middle year in our study period, and data from 1996 were used to approximate the "average" population over this period).[24]

We then performed regression analyses using the counts of firearm homicides and firearm suicides per census tract/neighborhood. The regression coefficients of six regression models are reported here: one for firearm homicides and one for firearm suicides in each of the three study areas. Specific firearm homicide and suicide count subgroups (for example, counts of handgun homicides in each neighborhood) were also assessed.

All regression equations were specified using both negative binomial (NB) and zero-inflated negative binomial (ZINB) models. Both model specifications were selected to account for the overdispersion caused by a preponderance of census tracts that experienced no firearm homicides or suicides.[25–28] Because likelihood ratio tests of overdispersion parameters were positive in most of the regression models constructed using both NB and ZINB specifications, we opted to use these two model specifications for all regression analyses as opposed to Poisson or zero-inflated Poisson model specifications.

The basic underpinning of the ZINB model is the incorporation of a splitting procedure in which the data generating process that produces zero outcomes is taken to be qualitatively different from the data generating process that produces positive outcomes.[26] Because we could not rule out that the zero and positive counts of firearm deaths in different neighborhoods had been generated by different processes, ZINB regressions were attempted alongside NB regressions. The better of the two model specifications was chosen based on R^2 values, standard errors, and Vuong's statistic.[29] Thus, use of the ZINB specification was motivated both theoretically, based on the possibility that different data generating processes were at play, and empirically, based on the possibility that the NB specification failed to adequately fit the neighborhood data under study.[30]

Independent variables

Through our regression analyses, we were able to test the influences of several measures of neighborhood environment at each study site. We included only neighborhood measures that provided unique information and that were theorized to affect both homicide and suicide in our regressions (Table 1). Because of the relatively small number of neighborhoods (the unit of analysis) in each study site, every effort was made to reasonably limit the number of independent variables and maintain the statistical efficiency of the regression models.[31] Thus, using previous reports as a guide, we selected 14 neighborhood-level predictors for analysis: (1) population density,[32–37] (2) population potential,[38,39] (3) age,[40–43] (4) gender,[41–44] (5) race,[1,38,41,44–47] (6) ethnicity,[1,38,41,44–47] (7) marital status,[40,45,48–57] (8) college education,[40,50] (9) household income,[32,40,49,50] (10) living alone,[37,38,40] (11) vacant housing,[38,49,58,59] (12) children living with one parent,[40,45,46,48–52] (13) female-headed households,[40,45,46,48–52] and (14) unemployment.[32,40,49,50]

The calculation of each of these neighborhood-level predictors is straightforward, with the exception of population potential. We calculated population potential as the sum of the 1995 populations in the census tracts in the immediate and contiguous counties divided by the rectilinear distances from the index census tract for which the value of population potential was being calculated.[38,60] Population-weighted centroids were used as the approximate center of gravity of the population in each census tract.[60] Because population potential took on large values, it was scaled by a factor of 10,000 and interpreted as tens of thousands of persons per mile.[38]

RESULTS

The data show that from 1994 through 1998, a total of 468 census tracts in Allentown, Youngstown, and Cedar Rapids experienced a total of 396 firearm homicides and 629 firearm suicides. The three study sites included different numbers of census tracts, and the three sites differed, sometimes markedly, in population density, population potential, and demographic make-up of the typical neighborhood in their area (Table 1).

Firearm homicides

The Allentown area experienced 54 firearm homicides, accounting for 22% of all intentional firearm-related deaths. The Youngstown area experienced 297 firearm homicides, accounting for 63% of all intentional firearm-related deaths. The Cedar Rapids area experienced 45 firearm homicides, accounting for 13% of all intentional firearm-related deaths. Across all three study areas, 75% of the firearm homicides occurred in 8.1% of the neighborhoods.

In each study site, a majority of firearm homicide decedents were male, most were young (<35 years

Table 1. Neighborhood-level summary statistics by study site

Variable	Allentown area	Youngstown area	Cedar Rapids area
Number of census tracts	131	126	211
	Mean (SD)	Mean (SD)	Mean (SD)
Firearm homicides per census tract	0.35 (0.84)	2.34 (4.32)	0.20 (0.55)
Firearm suicides per census tract	1.21 (1.42)	1.25 (1.43)	1.24 (1.35)
Population density	4,383 (5,057)	2,204 (1,874)	2,018 (3,898)
Population potential (10,000 residents per mile)	11.35 (3.36)	7.92 (2.02)	3.10 (2.26)
Median age (years)	37.39 (5.59)	36.80 (4.51)	35.54 (4.94)
Male (percentage)	48.57 (4.36)	47.67 (2.97)	48.85 (4.12)
Black (percentage)	2.63 (4.11)	17.19 (27.84)	2.34 (5.14)
Hispanic (percentage)	5.50 (10.09)	1.85 (3.62)	1.57 (2.59)
Married (percentage of individuals ≥15 years of age)	55.55 (13.75)	51.98 (13.60)	56.71 (14.44)
College-educated (percentage of adults ≥18 years of age)	37.62 (13.94)	31.03 (11.59)	44.17 (16.40)
Average household income (dollars)	47,968 (18,180)	35,033 (13,263)	40,240 (13,420)
Living alone (percentage)	23.66 (10.15)	24.97 (9.96)	26.18 (10.54)
Vacant housing units (percentage)	4.63 (3.17)	6.49 (4.66)	6.81 (5.29)
Children living with one parent (percentage)	29.71 (14.26)	36.61 (14.79)	30.03 (13.94)
Female-headed households (percentage)	14.72 (11.99)	21.06 (14.70)	12.67 (8.01)
Unemployment (percentage of individuals ≥16 years of age)	4.95 (2.93)	11.36 (9.18)	5.50 (3.24)

SD = standard deviation

old), and a large majority were unmarried. In two of the three study sites, the majority of homicide decedents were white (Table 2). However, the population-based rates for black firearm homicide were dramatically higher than those for white firearm homicide in all three study sites: 79.49 per 100,000 vs. 6.87 per 100,000 in the Allentown area, 386.15 per 100,000 vs. 15.48 per 100,000 in the Youngstown area, and 53.98 per 100,000 vs. 4.25 per 100,000 in the Cedar Rapids area.

In each site, most firearm homicides occurred outside the decedent's residence, most occurred on weekdays, and half or more occurred during the months of April through September. In two of the three study sites, the majority of firearm homicide decedents were injured during the evening/night as opposed to during the morning/afternoon (Table 2).

Population potential consistently increased with the number of firearm homicides in all three sites (Figure). Similarly, the regression analysis found that population potential was positively associated with number of firearm homicides in neighborhoods in the Allentown and Youngstown areas ($p<0.01$). Although the relationship between firearm homicides and population potential in the Cedar Rapids area was not consistent with the regression findings from our other two

study sites, the same regression equation produced a similar, positive association between population potential and homicides committed with handguns in the Cedar Rapids area ($p<0.10$). Several other neighborhood-level measures were associated with higher rates of firearm homicide in each of the three study sites: lower median age, higher proportions of black and Hispanic residents, and higher proportions of female-headed households (Table 3).

Firearm suicides

The Allentown area experienced 189 firearm suicides in 1994–1998, accounting for 77% of all intentional firearm-related deaths. The Youngstown area experienced 160 firearm suicides, accounting for 34% of all intentional firearm-related deaths. The Cedar Rapids area experienced 280 firearm suicides, accounting for 84% of all intentional firearm-related deaths. Across all three study sites, 75% of the firearm suicides occurred in 31.2% of the neighborhoods.

In each of the study sites, the majority of firearm suicide decedents were male, most were older (≥35 years), the vast majority were white, and half or more were unmarried (Table 2). Moreover, the population-based rates for black firearm suicide were lower than those for white firearm suicide in all three study sites:

Table 2. Decedent-level summary statistics by study site

	Firearm homicide			Firearm suicide		
	Allentown area	Youngstown area	Cedar Rapids area	Allentown area	Youngstown area	Cedar Rapids area
Variable	Number (Percent)	Number (Percent)	Number (Percent)	Number (Percent)	Number (Percent)	Number (Percent)
Gender						
Male	44 (81.5)	253 (85.2)	31 (68.9)	165 (88.7)	139 (86.9)	258 (92.1)
Female	10 (18.5)	44 (14.8)	14 (31.1)	21 (11.3)	21 (13.1)	22 (7.9)
Age						
<25 years	24 (44.4)	135 (45.6)	18 (40.0)	19 (10.3)	30 (18.8)	66 (23.6)
25 to 34 years	13 (24.1)	71 (24.0)	10 (22.2)	43 (23.2)	32 (20.0)	37 (13.2)
35 to 44 years	8 (14.8)	52 (17.6)	13 (28.9)	36 (19.5)	28 (17.5)	49 (17.5)
45 to 64 years	7 (13.0)	27 (9.1)	4 (8.9)	42 (22.7)	39 (24.4)	70 (25.0)
≥65 years	2 (3.7)	11 (3.7)	0 (0.0)	45 (24.3)	31 (19.4)	58 (20.7)
Race						
Black	12 (25.0)	228 (78.6)	11 (24.4)	2 (1.1)	16 (10.0)	4 (1.5)
White	36 (75.0)	62 (21.4)	34 (75.6)	184 (98.9)	144 (90.0)	272 (98.5)
Marital status						
Married	9 (17.0)	43 (18.5)	9 (20.0)	89 (47.9)	65 (42.2)	105 (37.6)
Unmarried	44 (83.0)	190 (81.5)	36 (80.0)	97 (52.1)	89 (57.8)	174 (62.4)
Place						
In home	17 (32.1)	83 (28.9)	22 (50.0)	152 (82.2)	109 (68.1)	215 (76.8)
Out of home	36 (67.9)	204 (71.1)	22 (50.0)	33 (17.8)	51 (31.9)	65 (23.2)
Time of day						
6 p.m.–6 a.m.	31 (57.4)	189 (69.5)	19 (46.3)	68 (42.2)	55 (43.0)	106 (42.7)
6 a.m.–6 p.m.	23 (42.6)	83 (30.5)	22 (53.7)	93 (57.8)	73 (57.0)	142 (57.3)
Day of week						
Weekend	21 (38.9)	87 (29.3)	9 (20.5)	69 (37.3)	55 (34.4)	79 (28.3)
Weekday	33 (61.1)	210 (70.7)	35 (79.5)	116 (62.7)	105 (65.6)	200 (71.7)
Month						
October to March	17 (31.5)	147 (49.5)	20 (45.5)	81 (43.8)	86 (53.8)	124 (44.4)
April to September	37 (68.5)	150 (50.5)	24 (54.5)	104 (56.2)	74 (46.3)	155 (55.6)

13.25 per 100,000 vs. 34.75 per 100,000 in the Allentown area, 27.10 per 100,000 vs. 33.98 per 100,000 in the Youngstown area, and 19.63 per 100,000 vs. 53.98 per 100,000 in the Cedar Rapids area.

Most firearm suicides occurred at the decedent's residence, most occurred in the morning/afternoon, and most occurred on weekdays in each of the three study sites. In two of the three study sites, the majority of firearm suicide decedents were injured during the months from April to September (Table 2).

A neighborhood's population potential consistently decreased with the number of firearm suicides in all three sites (Figure). Correspondingly, the regression analysis consistently showed an inverse relationship between population potential and number of firearm suicides per neighborhood ($p<0.05$). The regression analysis also revealed other neighborhood-level measures that were consistently associated with higher numbers of firearm suicides at all three study sites: lower proportions of black residents and higher proportions of vacant housing units (Table 3).

DISCUSSION

Individuals who intentionally kill others or themselves will predominantly do so with the most effective means at their disposal—namely, firearms.[61–64] Homicide and suicide are thus closely related by intent and by firearms. Despite these commonalities, programs of research to better understand these two entities have developed in relative isolation.

This study compares firearm homicide and firearm suicide in and around three U.S. cities using routine activity theory as a framework for analysis. It reinforces earlier findings[2,13,65] of several opposite-but-equal relationships between homicide and suicide: black vs. white, out-of-home vs. in-home, night vs. day, and geographically concentrated vs. geographically disperse.[2,13,65] It also newly demonstrates the relationship of population potential with homicide and suicide, again in an opposite-but-equal manner.

First developed in 1958,[66] the population potential measure controls for how many people are likely to visit a neighborhood because they are close to it.[38,67] Measuring not only how many people reside in a neighborhood but also how many are likely to use a neighborhood merely because they are nearby has proven valuable in better understanding various social, economic,[60] and health-related[39] phenomena, including homicide.[38,58]

Unlike population measures internal to each neighborhood, population potential is able to distinguish truly congested and truly isolated neighborhoods. For

Figure. Inverse relationships between neighborhood population potential and the numbers of firearm homicides and firearm suicides, 1994–1998
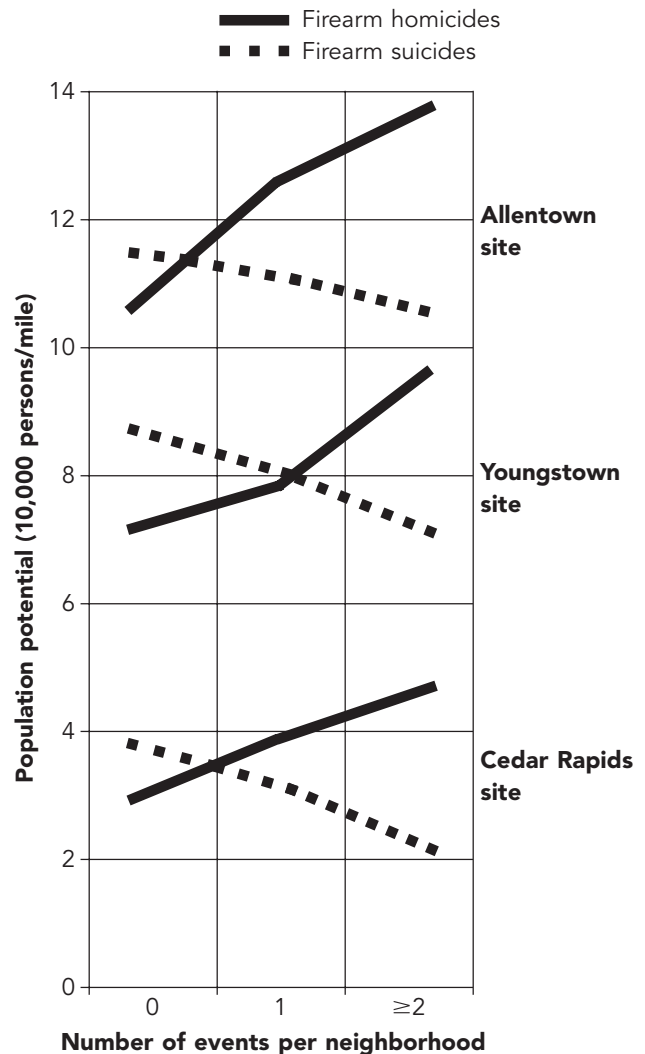
instance, a high population density neighborhood surrounded by low population neighborhoods may only be seemingly congested; a low population density neighborhood surrounded by high population neighborhoods may only be seemingly isolated. Population density measures the isolation or congestion experienced by an *individual* within the context of their surrounding neighborhood, while population potential measures the isolation or congestion experienced by a *neighborhood* within the context of its surrounding neighborhoods.[38,67]

In all three of our study sites, population potential, unlike population density, was consistently associated

Table 3. Regression models of the counts of firearm homicides and suicides by study site

	Firearm homicide			Firearm suicide		
	Allentown area	Youngstown area	Cedar Rapids area	Allentown area	Youngstown area	Cedar Rapids area
Variable	β-coefficient (SE)	β-coefficient (SE)	β-coefficient (SE)	β-coefficient (SE)	β-coefficient (SE)	β-coefficient (SE)
Population density	0.046 (0.049)	−0.063 (0.040)	−0.001 (0.001)	−0.006 (0.004)	0.015[a] (0.002)	0.006 (0.029)
Population potential	0.178[a] (0.068)	0.193[a] (0.072)	−0.049 (0.123)	−0.112[b] (0.054)	−0.163[b] (0.075)	−0.141[a] (0.054)
Median age	−0.035 (0.075)	−0.057[b] (0.025)	−0.136[c] (0.076)	−0.071[b] (0.030)	0.032 (0.027)	−0.080[a] (0.028)
Male	0.116[c] (0.066)	−0.043[b] (0.022)	−0.028 (0.068)	−0.169[a] (0.058)	0.010 (0.039)	0.036 (0.031)
Black	0.041 (0.072)	0.032[a] (0.005)	0.009 (0.032)	−0.103[b] (0.044)	−0.014 (0.011)	−0.015 (0.021)
Hispanic	0.036 (0.025)	0.042[a] (0.015)	0.037 (0.045)	−0.012 (0.014)	0.018 (0.029)	0.013 (0.033)
Married	0.074 (0.061)	0.013 (0.026)	−0.056 (0.041)	0.023 (0.017)	−0.018 (0.025)	0.039[b] (0.016)
College-educated	−0.007 (0.035)	0.023[a] (0.008)	0.029 (0.028)	−0.016 (0.015)	0.004 (0.015)	−0.002 (0.010)
Average household income	−0.082[c] (0.046)	−0.025 (0.016)	0.005 (0.025)	−0.008 (0.014)	0.004 (0.020)	0.003 (0.011)
Living alone	0.001 (0.049)	0.002[b] (0.001)	−0.006[b] (0.003)	−0.001 (0.001)	0.001 (0.001)	0.001 (0.008)
Vacant housing units	0.004 (0.072)	0.003 (0.007)	−0.003[b] (0.001)	0.005 (0.011)	0.008 (0.009)	0.001 (0.001)
Children living with one parent	0.027 (0.019)	0.011 (0.008)	−0.088[a] (0.030)	−0.007 (0.011)	0.013 (0.019)	0.002 (0.009)
Female-headed households	0.034 (0.032)	0.015 (0.150)	0.044 (0.051)	−0.012 (0.036)	0.006 (0.025)	0.036 (0.027)
Unemployment	−0.214[b] (0.101)	−0.006 (0.009)	0.317[a] (0.098)	−0.029 (0.073)	0.006 (0.025)	−0.013 (0.034)
R²	0.500	0.740	0.467	0.063	0.131	0.071

[a] p<0.01
[b] p<0.05
[c] p<0.10

SE = standard error

with both firearm homicide and firearm suicide. As measured by population potential, truly congested neighborhoods, where many more people were likely to be coming and going, tended to experience the most firearm homicides, whereas truly out-of-the-way neighborhoods, where many fewer people were likely to be coming and going, tended to experience the most firearm suicides. These phenomena are likely related to differences in the routine activities of the inhabitants who populate neighborhoods of very high or very low population potential.[38]

The main premise of routine activity theory is that individuals are more likely to be victimized when they are poorly guarded, attractive targets, and exposed to motivated offenders.[5] Guardians include friends, family, police, teachers, coaches, employers, apartment managers and, in some cases, ordinary citizens. For potential targets of homicide, travel to certain areas can take them away from safer, high guardianship havens, exposing them to motivated offenders. Thus, the opportunity for homicide is greater when individuals spend time away from home. Moreover, the need to monitor large groups of people, many of whom may not be local residents, may make the maintenance of social control in neighborhoods where many people are likely to be coming and going very difficult, further contributing to higher numbers of homicides.[4,7,8,38,48,68,69]

These tenets of routine activity theory were borne out in our analysis of firearm homicide. In two of three study sites, firearm homicide occurred most frequently outside a decedent's home and more frequently in the evening/nighttime hours. Higher numbers of firearm homicides were also significantly linked to higher population potential neighborhoods in all three study sites. It is likely that more frequent encounters between victims and offenders, more difficulty in maintaining social controls, and more anonymity (that is, more people who "went their own way" as opposed to "helped one another") resulted in people ignoring or less effectively performing guardianship activities in these neighborhoods.[4,38,58,69–72] Thus, out-of-home, nocturnal activity in neighborhoods where many people were likely to be coming and going may have heightened the risk of firearm homicide by increasing the interaction of victims and offenders in situations where guardianship was low.

Given that the target and the offender are the same in a suicide, routine activity theory also worked well as a basis for analyzing firearm suicide in our study sites. In all three, firearm suicide occurred most frequently within a decedent's home and in the morning/afternoon hours. A higher occurrence of firearm suicide was also significantly linked with lower population potential neighborhoods in all three study sites. Neighborhoods in which very few people were likely to be coming and going may have enhanced the motivation of individuals to commit suicide through limited access to activities, goods, and services that are normally abundant in or around less isolated neighborhoods. Individuals who were uncertain about killing themselves may have grown more determined because they simply had less face-to-face guardianship through which to channel any suicidal ideations.[36,37,55] This absence of guardianship was further supported by the occurrence of firearm suicide primarily in the home and during the hours of the day when most people were at work or school. Thus, in-home, solitary activity in out-of-the-way neighborhoods may have magnified the risk of firearm suicide by increasing the resolve of self-destructive individuals in situations where guardianship was low.

Despite these consistent findings, some limitations became evident over the course of our study. First, we analyzed only data pertaining to deaths. Our findings might have been different had data on victims of all intentional shootings been analyzed, including victims who were shot and did not die. Second, certain data were not available to us and thus were not included in our analyses. Some missing variables may have influenced the occurrence of firearm homicides (for instance, police activity) or firearm suicides (for example, access to mental health services). Finally, it is possible that the census tract data we analyzed incompletely determined the experience of individuals within their neighborhoods.[73,74] Although to some extent this limitation is unavoidable, we selected census tracts as our units of analysis because they are small, relatively permanent statistical subdivisions of counties; because they are designed to be homogeneous with respect to population characteristics, economic status, and living conditions; and because they have been successfully used as representations of neighborhoods in past research.[44,50,75–77] Census tracts are much better neighborhood representations of individual risk than larger geographic units such as states, counties, or cities.[32,35]

Firearm homicide and firearm suicide each requires certain situational inducements. Many of these inducements are the by-products of a neighborhood's routine activities.[5] In combination with individual-level data, the measurement of population potential offers a new perspective on the analysis of these routine activities. Thus, in the sites we studied, firearm homicide was generally associated with out-of-home, nighttime activity in neighborhoods where many people were likely to be coming and going. In an opposite-

but-equal fashion, firearm suicide was consistently associated with in-home, daytime activity in out-of-the-way neighborhoods.

Firearm homicide is a criminal act that often garners a great deal of public attention and resources. Because firearm suicides are noncriminal acts[77,78] that very often occur as lonely affairs within lonely neighborhoods, they generally do not receive the same level of attention or resources as firearm homicides. Therefore, firearm suicide frequently goes under-noticed despite its opposite-but-equal status relative to firearm homicide.[80,81] More awareness and additional public health studies of firearm suicide, in tandem with firearm homicide, should be pursued to better identify individuals and neighborhoods that are at greatest risk of experiencing these events.

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