

Schools, Neighborhood Risk Factors, and Crime

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Abstract

Prior research has identified a link between schools (particularly high schools) and neighborhood crime rates. However, it remains unclear whether the relationship between schools and crime is a reflection of other criminogenic dynamics at the neighborhood level or whether schools influence neighborhood crime patterns independently of other established structural predictors. We address this question by investigating the relationship between schools and serious crime at the block group level while controlling for the potentially criminogenic effects of neighborhood instability and structural disadvantage. We find that, net of other structural correlates, neighborhoods with high schools and middle schools experience more violent, property, and narcotics crimes than those without middle or high schools. Conversely, neighborhoods with elementary schools exhibit less property crime than those not containing elementary schools. These results, which are consistent with prior research and with explanations derived from the routine activities and social disorganization perspectives, suggest some strategies for police deployment and community involvement to control crime.

Keywords

schools and crime, routine activity theory, social disorganization theory

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Introduction

Schools, though relatively safe places for youth, are not immune to crime and violence. In fact, in the 2007-2008 school year, 94% of middle and high school campuses reported at least one violent incident, as did 65% of elementary schools (Robers, Zhang, Truman, & Snyder, 2010). While much research has examined the individual-level dynamics of school crime, focusing on both the causes and consequences of school-based crime and victimization (Burrow, 2008; Garofalo, Siegel, & Laub, 1987; Veenstra et al., 2005; Wilcox, Augustine, Bryan, & Roberts, 2005), a smaller body of research has investigated how schools might affect the dynamics of crime at the neighborhood level (Gouvis-Roman, 2004; Kautt & Roncek, 2007; LaGrange, 1999; Murray & Swatt, 2010; Roncek & Faggiani, 1985; Roncek & Lobosco, 1983). This research suggests that crime at and around schools, particularly middle and high schools, can spill over into the local neighborhood and even adjacent neighborhoods, influencing crime beyond the immediate school environment. It is unclear, however, whether schools contribute to neighborhood crime patterns as part of a broader set of criminogenic structural dynamics, or whether their influence is independent of other established neighborhood-level influences. This question has both theoretical and practical importance. Theoretically, schools may be hot spots that independently contribute to elevated crime rates, or they may simply reflect the criminogenic processes that are playing out in the neighborhoods in which they are located. While it is likely that both processes are at play, from a policy perspective, it is important to document the degree to which schools have an effect on crime that extends beyond the effects of key neighborhood-level structural dynamics that local schools and other community-based institutions tend to mirror. Focused school-based interventions may partly ameliorate school-specific effects of crime, but likely have less influence on the broader structural dynamics affecting local crime patterns.

The research linking schools and crime does not directly address this question. Research consistently indicates that high schools contribute to increased crime rates at the block group level (Gouvis-Roman, 2004; Murray & Swatt, 2010; Roncek & Faggiani, 1985; Roncek & Lobosco, 1983) and more recent research suggests the same is true of middle schools (Murray & Swatt, 2010; Wilcox et al., 2005). Such patterns are less evident in neighborhoods containing elementary schools (Murray & Swatt, 2010), though even here, the few studies that have assessed the influence of elementary schools on neighborhood crime show mixed findings (Kautt & Roncek, 2007). Research examining school effects on neighborhood crime generally

attributes the criminogenic effects of schools to the routine activity patterns of middle and high school aged youth and the broader social disorganization patterns within the communities where schools are located. However, across studies examining the influence of schools on neighborhood crime, the question of whether schools contribute to crime independently or as part of a set of broader structural correlates is unclear as these studies generally do not include controls for key criminogenic structural processes linked to disadvantage and other indicators of neighborhood instability.

In the present study, we use data from Albuquerque, New Mexico, to address some of the limitations of previous research on schools and crime at the neighborhood level. Specifically, we assess the influence of elementary, middle, and high schools on neighborhood crime rates, controlling for key structural correlates of crime. By controlling for structural disadvantage, residential mobility, and family disruption, we are able to assess the degree to which schools influence crime independent of these criminogenic structural correlates. In other words, we address the question of whether significant relationships between schools and neighborhood crime are, at least in part, reflective of school-specific effects or whether they are exclusively reflective of the structural contexts within which schools are situated. We also disaggregate our analysis by type of school and by type of crime to assess whether the effect of schools on crime varies by school type or crime type. Furthermore, by including elementary, middle, and high schools in our analysis, we address the possibility that different levels of schools are related to neighborhood crime in different ways.

Literature Review

Though more substantive than theoretical in orientation, prior research examining the relationship between schools and neighborhood crime is framed in terms of routine activities and social disorganization theories. Evidence of a link between schools and neighborhood crime is consistent with expectations from both of these theoretical perspectives. Both theories would argue that schools increase neighborhood crime rates by bringing together groups of youth under conditions that provide for limited formal and informal social control. From a routine activities perspective, schools are expected to be hot spots that inflate crime by bringing offenders in contact with victims or material targets under limited guardianship. Similarly, social disorganization theory would suggest that the aggregation of school aged youth who do not have strong community ties is likely to compromise neighborhood-level collective efficacy and inflate crime rates.

Routine activities theory states that criminal acts require the convergence of three elements: motivated offenders, suitable targets, and the absence of capable guardians (Cohen & Felson, 1979, p. 589). Building on utilitarian principles, the absence of any one of these elements increases the risks of crime relative to its rewards, making crime less likely. At the macro level, routine activities theory is rooted in the social and physical ecology perspective, which argues that “crime rates are affected not only by the absolute size of the supply of offenders, targets, or guardianship, but also by the factors affecting the frequency of their convergence in space and time” (Sherman, Gartin, & Buerger, 1989, pp. 30-31). In other words, specific places are likely to be crime prone, due to the convergence of would-be offenders, vulnerable victims, and a lack of guardianship.

Previous research utilizing the routine activities framework has linked certain location types to crime, designating these locations as hot spots (i.e., locations where there is more crime than would be expected by chance). A number of studies, for example, have identified bars as criminogenic locations (Block & Block, 1995; Roncek & Bell, 1981; Roncek & Maier, 1991; Roncek & Pravatiner, 1989; Sherman et al., 1989). Bar patrons are likely to carry cash, which makes them a suitable target for property offenses, and may be less capable of guarding themselves and their assets when intoxicated (Roncek & Maier, 1991). In addition, bars act as activity hubs, where large groups of individuals congregate. The density of individuals at bars can increase the likelihood of crime by increasing anonymity and reducing the capacity for supervision and guardianship (Roncek, 1981). In addition to bars, research has identified other hot spots like liquor stores, parks, homeless shelters, theaters, malls, and convenience stores (LaGrange, 1999; Sherman et al., 1989).

It is important to note that the routine activities perspective argues that hot spots will generate crime both at the specific hot spot place and in the surrounding area. The hot spot itself is expected to generate crime due to the convergence of motivated offenders and suitable targets. The areas directly surrounding the hot spots are also expected to generate crime for the same reasons, as the areas around the hot spots will contain the routes to and from the hot spot. Therefore, from the routine activities perspective, schools can be expected to be high-crime places for a number of reasons. First, schools are occupied by juveniles. Older juveniles and young adults are more likely to offend than individuals in other age categories. Moreover, youths are more likely than individuals in any other age group (with the possible exception of young adults) to be victims of crime (Rand & Catalano, 2007). Schools, therefore, bring together individuals from age groups that are characterized

by higher offending and victimization rates. In that sense, schools ensure the convergence of potential offenders and victims. Of course, given the relationship of age to offending and victimization, elementary schools should not exhibit the same criminogenic patterns as middle and high schools because the student population has not yet reached peak offending ages.

Second, research suggests that a substantial proportion of youth victimization is related to the routine activities of attending school (Garofalo et al., 1987). Student–teacher ratios in most schools are such that capable guardianship is often limited or absent, a situation that is compounded in middle and high schools, which generally have greater student-to-teacher ratios than elementary schools. Given the convergence of motivated offenders and suitable targets in the school environment, these limitations on capable guardianship should further increase crime and victimization at or near schools.

The social disorganization perspective also suggests a relationship between schools and crime. Contemporary social disorganization theory suggests that structural factors (like poverty, residential mobility, heterogeneity, and family disruption rates) influence the quality and quantity of neighborhood social ties and attachments, which, in turn, largely determine a community's level of collective efficacy (Sampson, 1986; Sampson & Groves, 1989; Sampson, Raudenbush, & Earls, 1997). Social disorganization scholars suggest that local institutions may play an important role in the generation of collective efficacy. Krivo and Peterson (1996), for example, noted that

Disadvantaged communities do not have the internal resources to organize peacekeeping activities . . . and at the same time, local organizations (churches, schools, recreation centers) that link individuals to wider institutions and foster mainstream values are lacking. (p. 622)

One implication of this statement is that we might expect local institutions, like schools, to be associated with community outcomes above and beyond structural predictors. There is some evidence to support this perspective. Peterson, Krivo, and Harris (2000), for example, found a modest negative relationship between the presence of community centers and crime. Effective schools, therefore, are likely to be a feature of socially organized communities, whereas socially disorganized communities are likely to have failing schools. In this sense, schools may serve as a useful indicator of a neighborhood's level of social organization. Beyond reflecting the characteristics of the neighborhoods in which they are located, schools may also promote or hinder social organization. Schools promote the formation of local organizations, like parent–teacher associations, and add additional structure and supervision to

the juvenile population, both through the process of schooling and through associated extracurricular clubs and activities. School level may in part determine whether a school promotes or hinders the generation of collective efficacy. Elementary schools, with their relatively higher rates of parent participation and lower student to teacher ratios, may promote the formation of collective efficacy, whereas high schools, with their relatively lower rates of parental involvement and higher student-to-teacher ratios, may stifle the formation of collective efficacy. A social disorganization inspired explanation overlaps considerably with a routine activities inspired explanation. It may be the case that high schools hinder the generation of collective efficacy while producing behavioral patterns that are conducive to crime, whereas elementary schools promote the generation of collective efficacy while producing behavioral patterns that are not conducive to crime.

Empirical research on schools and neighborhood crime suggests that schools are, in fact, associated with higher rates of crime at the neighborhood level. For example, Roncek and Lobosco (1983) found that within San Diego, California, city blocks that contain or are near public high schools have higher index crime rates than other blocks. These results have been replicated in Cleveland, Ohio (Roncek & Faggiani, 1985). The effects of school presence on crime seem to hold even when controlling for demographic structure, average housing value, and the percentage of dwellings that vacant and used as apartments (Kautt & Roncek, 2007). However, at the level of analysis, this research does not control for more traditional structural correlates of crime such as neighborhood unemployment, poverty, education, or mobility, for which data are not available at the block level. As such, it remains a possibility that the school effect established in this body of research is more a reflection of the structural contexts in which schools are situated, than of the presence of schools themselves.

The implications of existing research on schools and crime is further complicated by the general tendency to focus on high schools exclusively. Though both routine activities and social disorganization theories would suggest that high schools are more criminogenic than middle schools and elementary schools, without comparing the influence that schools serving different age groups have on neighborhood crime rates, we cannot be sure that observed school effects reflect the theoretical processes invoked to explain them. Recently, researchers (Gouvis-Roman, 2004; Kautt & Roncek, 2007; Murray & Swatt, 2010) have expanded the investigation of schools and neighborhood crime to include elementary and middle schools. This research indicates that school level is important. Gouvis-Roman (2004), for example, found that proximity to either a middle or high school is associated with higher rates of

violent crime at the block level and in fact, that there is little difference in the criminogenic effects of middle schools and high schools. Conversely, Kautt and Roncek (2007) and Murray and Swatt (2010) have found contradictory results regarding the role of elementary schools. Contrary to routine activity and social disorganization explanations of the school effect, Kautt and Roncek (2007) found that the presence of elementary schools is associated with increases in burglary at the block level, whereas Murray and Swatt found that the presence of elementary schools is associated with decreases in burglary at the block level. Clearly, additional research is needed to establish the nature and extent of neighborhood-level school effects and to test the adequacy of the routine activities perspective as an explanation of these effects.

The Present Study

While research suggests that schools contribute to neighborhood crime rates, this research has not convincingly demonstrated that this effect is independent of the broader structural context within which schools are situated. In the present study, we assess the degree to which school effects hold, independent of key structural factors that are consistently linked to crime at the neighborhood level.

Hypothesis 1: Neighborhoods containing schools will have more crime than neighborhoods without schools, controlling for structural factors.

In addition, following the logic of the routine activities and social disorganization theories, we expect high schools to generate more crime than middle schools, which should, in turn, generate more crime than elementary schools. Compared with middle and elementary schools, high schools are more densely populated and are populated with youth whose criminal involvement is beginning to peak (motivated offenders). Moreover, there are fewer teachers per student at high schools, decreasing capable guardianship, and the related formal and informal social controls that reduce crime. Parents are less active, involved, and present at high schools, further decreasing guardianship and local community building and collective efficacy. Finally, larger schools mean more crime targets (both persons and their property). Working from this framework, we present the following hypothesis

Hypothesis 2: High schools will be associated with more crime at the neighborhood level than middle schools, which, in turn, will be

more strongly associated with neighborhood crime than elementary schools, net of other neighborhood-level structural factors.

Research Design

Our primary aim is to assess the effect of schools on neighborhood crime net of well-established structural indicators of community disadvantage that are consistently linked to crime. Few studies have examined the influence of schools on crime while controlling for other community-level structural characteristics like concentrated disadvantage and residential instability that are known to be related to crime patterns. It is not clear whether the school effect would hold independent of these influences. The limited controls introduced in studies of neighborhood-level school effects stems from the empirical complexities associated with neighborhood analyses. It is difficult to empirically specify neighborhoods and communities and most neighborhood research in criminology has used census-defined jurisdictions, such as census tracts, block groups, and blocks to approximate neighborhoods and neighborhood patterns and trends (Sampson, Morenoff, & Gannon-Rowley, 2002). While census designations are artificial and do not necessarily match the lived experience of being in a neighborhood and/or community, they are often the only option for researchers interested in meso-level processes, as they are easily identifiable and are connected to a wide range of data collected by the U.S. Census Bureau. The block level is an appealing approximation of neighborhoods as blocks are the smallest Census unit. For this reason, prior research on schools and neighborhood crime has generally been conducted at the block level (Kautt & Roncek, 2007; Roncek & Faggiani, 1985; Roncek & Lobosco, 1983). Unfortunately, this has limited researchers' ability to control for community-level structural characteristics as the Census does not provide data on the key structural indicators associated with crime at the block level.

For the present research, we have opted to utilize the block group level of analysis. Block groups are the second smallest census designation and comprise blocks. Although utilizing blocks would make the current research more directly comparable with previous research on schools and crime, doing so would limit our ability to account for the potential influence of important structural variables. The U.S. Census Bureau maintains more social, economic, and demographic information at the block group level than it does at the block level. In particular, a variety of measures of structural disadvantage (including measures of education, income, and employment) are available only at the block group and larger levels of aggregation. By utilizing the

block group level of analysis, we are able to make statements about the relative importance of schools compared with other predictors of crime, thereby adding to the existing body of research on school effects.

Data

The data for this research cover three areas: crime, social and demographic features of neighborhoods, and schools. The Albuquerque Police Department (APD) and the Bernalillo County Sheriff's Department (BCSD) provided incident-level crime data used in this report. The incident-level data include the date, time, location, and statute violation for all documented incidents in the data. Here we focus on the link between schools and serious crime at the neighborhood level, including Part I violent and property offenses, as well as narcotics violations in our analyses. Specifically, we evaluate the effect of school presence on robbery, aggravated assault, burglary, larceny, motor vehicle theft, and narcotics violations.¹ We exclude homicide and rape from our analysis, both because these offenses occur extremely infrequently at the block group level and because our focus is on serious offenses that peak in adolescence as these offenses should be most strongly influenced by school presence. While schools might be related to other less serious crime types (e.g., vandalism and simple assault), we focus on the more serious offenses that research suggests are more often reported to and accurately counted by the police (Mosher, Miethe, & Phillips, 2002).

To examine neighborhood crime patterns, we geocoded all serious crime incidents reported between 2001 and 2005 using ArcGIS mapping software. Once mapped, incidents were matched to census block groups and aggregated, providing a count of crime incidents within each census block group in Albuquerque. These counts were summed from 2001 to 2005, to account for annual fluctuations and to maximize variation (thereby improving our ability to account for variance in crime across block groups). A summary of the crime data included in this analysis is presented in Table 1.

Among our key goals is to assess the degree to which school effects hold independent of established neighborhood-level structural predictors of crime. To do this, we include in our analyses common structural and demographic measures of neighborhood disadvantage and instability pulled from the Census 2000 Summary File 3. To measure structural disadvantage and instability, we calculated the percentage of each of the following variables within every block group: renter-occupied housing, single-parent head of household, unmarried, moved in the past 5 years, vacant housing, people with less than a high school education, people living under the poverty line, households

Table 1. Crime Incidents From 2001 to 2005 by Block Group.

	M	SD	Minimum	Maximum
Robbery	16.76	22.24	0	136
Aggravated assault	43.08	49.12	0	468
Burglary	78.48	65.70	0	532
Larceny	272.46	431.66	0	4,072
Motor vehicle theft	57.22	60.78	0	482
Narcotics incidents	46.56	103.65	0	1,651

receiving public assistance, and joblessness (unemployed individuals plus those not in the labor market). These include key variables commonly used as proxies for social disorganization processes that contribute to the declines in collective efficacy theorized to inflate crime rates at the neighborhood level (Bursik, 1988; Sampson et al., 1997; Sampson & Groves, 1989).

As suggested by previous research, many of these variables are collinear (Sampson et al., 1997). To address this problem, we utilized principal components analysis (PCA) to reduce these variables into a series of orthogonal component scores (for details, see Dunteman, 1989). This procedure, using a varimax rotation to improve interpretability, produced two components with eigenvalues greater than one, which together, accounted for nearly 70% of the variance within the variables. The eigenvalues of the first two components, along with associated scree charts, indicated that it was reasonable to exclude the remaining components on the grounds that the first two components adequately addressed the variance in the included variables. The following variables loaded on the first component: percentage of renter-occupied housing, percentage of households with a single parent, percentage of people not married, percentage of people that have moved in the past 5 years, and percentage of housing vacant. We define this component as “*instability*,” meaning that these variables represent a neighborhood level of flux either through residential mobility or through family disruption. The variables that loaded on the second component include percentage with less than a high school education, percentage in poverty, percentage of households receiving public assistance, and percentage joblessness. We label this component “*structural disadvantage*.”

In addition to the variables described above, we also include controls for neighborhood demographic characteristics, as these have also been linked to crime rates. Specifically, we include data on the total population of block

Table 2. Descriptive Statistics.

Variable	M	SD	Minimum	Maximum
Total population	1,294.60	646.38	31	4,355
% Hispanic	40.96	24.05	0	100
% 18 or below	24.98	8.33	3.33	71.99
Instability	0	1	-2.23	3.09
Disadvantage	0	1	-1.52	3.72
Elementary schools	0.17	0.38	0	1
Middle schools	0.06	0.22	0	1
High schools	0.03	0.17	0	1

groups, the percentage of the population that is Hispanic, and the percentage of the population that is 18 and under from the 2000 Census. We checked for collinearity and found these variables to operate independent of the *instability* and *structural disadvantage* measures described above, so we include them as separate control variables in our analyses.

The school data came from two sources. First, the City of Albuquerque maintains, and makes available for download, ESRI (Environmental Systems Research Institute) shapefiles that map the location of all public schools in Albuquerque. We consulted the National Center for Education Statistics (NCES) list of public schools and removed all schools that were not open from 2000 to 2004.² The school location data were merged with the crime and census data. Using the merged, geocoded school data, we created three sets of dummy variables to indicate whether each block group contained an elementary, middle, or high school (coded 1 if present, 0 if not for each level of school).

Table 2 presents the descriptive statistics for the independent variables included in this study. Two block groups within the sample area have no residents and were excluded from our analyses.

Method

We utilized regression techniques to determine the relationship between schools and crime, net of neighborhood structural and demographic context. Note, however, that because criminal incidents are discrete events and because many of the crime types covered in this analysis are heavily

skewed, traditional ordinary least squares (OLS) regression techniques are inappropriate. Poisson regression, a variant of the generalized linear model, is typically preferred to OLS when dealing with count data (Osgood, 2000). This regression model describes the relationship between a set of independent variables and the expected count of a dependent variable. A preliminary analysis suggested that each of our dependent variables were overdispersed (i.e., they have a variance significantly greater than the mean). When this occurs, it is common to utilize negative binomial regression. Negative binomial regression, although not formally a generalized linear model, is similar to Poisson regression, includes an extra term to model overdispersion. Specifically, negative binomial regression maintains the same style of interpretation as Poisson regression coefficients, where a unit increase in an independent variable corresponds to multiplying the dependent variable by e^{b_i} , where b_i is the regression coefficient for the i th variable. To account for population differences across block groups, we included population size (the number of residents per block group) as an exposure variable (Osgood, 2000).

We also addressed spatial dependency in each of the regression models. Spatial dependency occurs because geographically close observations are likely to be more similar to each other than units that are geographically distant. Spatial dependency can come from multiple sources, including the artificial nature of census jurisdiction and “spillover.”³ Significant spatial dependency can lead to issues of spatial autocorrelation in statistical procedures. Spatial autocorrelation is a substantial problem, as it suggests that observations are not independent. For regression analyses, spatial autocorrelation can result in unstable regression coefficients and inaccurate standard error estimates. In other words, it is difficult to determine the effects of independent variables in the presence of spatial autocorrelation. Using the CrimeStat Spatial Statistics program, we calculated Moran’s I for each of the dependent variables utilized in our analysis and found that each of our dependent variables demonstrated significant clustering and spatial autocorrelation. To address this spatial autocorrelation, we used GeoDa software to calculate spatial lags for each dependent variable in our analysis. The spatial lag is defined as:

$$\sum_j \omega_{ij} x_j,$$

where x_j is the j th observation of variable x and ω_{ij} is the weight from the i th row of the spatial weights matrix (Anselin, 1992). This is essentially the

weighted average of values in adjacent block groups. Therefore, spatial lags account for spatial autocorrelation by controlling for levels of a variable in surrounding areas.

It should be noted that we do not include an overall adjacency measure for schools in our regression analyses. Many of the previous studies on schools and neighborhood crime have included adjacency measures (Kautt & Roncek, 2007; Roncek & Faggiani, 1985; Roncek & Lobosco, 1983). Typically, these adjacency measures are dummy variables that indicate whether an adjacent geographic unit (always the census block in previous research) contains a school. This measure is intended to capture the effects of schools on crime in nearby areas. However, 400 of the 432 block groups in Albuquerque are adjacent to one or more block groups that contain a school.⁴

Results

To investigate the relationship between schools and crime at the block group level, we estimated a number of negative binomial regression equations.

The spatial lag variable is significant for all of the offenses examined in Table 3. This suggests that there is considerable clustering of these offenses. Accordingly, we include our measure of spatial lag in all of the models as a method of controlling for spatial autocorrelation.

The regression results regarding structural variables are generally consistent across crime types. The *structural disadvantage* and *instability* components are significant, positive predictors of all but one crime type (larceny). This suggests that block groups characterized by higher levels of disadvantage and instability are likely to experience a larger volume of violent, property, and drug crime than block groups with lower levels of disadvantage and instability. The only exception to this is that *structural disadvantage* is not significantly related to larceny rates. Whereas block groups with higher levels of *instability* report higher counts of larceny than other block groups, block groups with higher levels of *structural disadvantage* do not appear to be any different in terms of larceny incidents than other block groups. The percentage Hispanic variable is a significant, positive predictor of aggravated assault and narcotics incidents. The percentage of the population that is 18 and under is significantly and negatively associated with all types of crime included in this analysis. This suggests that block groups with a larger proportion of minors, controlling for other factors, are likely to report fewer crime incidents than block groups with fewer minors.⁵ These results are as expected and consistent with the theoretical and empirical literature linking neighborhood structural and demographic contexts with neighborhood crime.

Table 3. Regression Results for Property/Narcotics Crime Incidents Including School Presence Variables.

	Robbery	Aggravated assault	Burglary	Larceny	Motor vehicle theft	Narcotics incidents
Lag	0.035** (0.005)	0.005** (0.001)	0.006** (0.001)	0.001** (< 0.001)	0.008** (< 0.001)	0.004** (0.001)
Disadvantage	0.299** (0.103)	0.355** (0.054)	0.210** (0.052)	0.040 (0.071)	0.212** (0.057)	0.540** (0.084)
Instability	0.346** (0.056)	0.408** (0.029)	0.187** (0.027)	0.301** (0.038)	0.356** (0.031)	0.414** (0.046)
% Hispanic	0.001 (0.004)	0.007** (0.002)	-0.001 (0.002)	0.005 (0.003)	0.001 (0.002)	0.007* (0.003)
% under age	-0.023** (0.007)	-0.018** (0.004)	-0.014** (0.003)	-0.021** (0.004)	-0.012** (0.004)	-0.033** (0.005)
Elementary school	-0.002 (0.131)	-0.014 (0.068)	-0.141* (0.062)	-0.223* (0.092)	-0.108 (0.071)	0.035 (0.104)
Middle school	0.213 (0.211)	0.222* (0.109)	0.025 (0.103)	0.041 (0.152)	0.118 (0.116)	0.668** (0.169)
High school	0.307 (0.279)	0.373** (0.144)	0.161 (0.136)	1.010** (0.203)	0.223 (0.153)	1.600** (0.233)
Constant	-4.656** (0.237)	-3.702** (0.121)	-2.959** (0.119)	-1.660** (0.151)	-3.447** (0.127)	-3.498** (0.177)
Log-Likelihood	-1,526.26	-1,758.44	-2,056.36	-2,673.08	-1,923.16	-1,830.14
Pseudo R ²	.0573	.1145	.0580	.0386	.0799	.0948

Note: Standard errors in parentheses.

*p < .05. **p < .01.

Our central question is how schools factor in these established processes. On one hand, schools will reflect the dynamics of the neighborhoods in which they are located and so any relation between schools and crime may simply be a spurious reflection of these neighborhood-level dynamics that are mirrored by the school. At the same time, schools may also introduce unique and independent effects via school-specific social organization and routine activity patterns.

The results suggest that school presence does exert an independent effect on local crime rates. Controlling for structural and demographic indicators, school presence is significantly related to certain types of crime at the block group level. However, these effects are not entirely uniform across crime type or school type. Different levels of schools are related to different types of crime. Elementary schools, for example, are mostly unrelated to violent crime. That is, the relationship between the presence of an elementary school and the number of reported violent crime incidents in a block group is not statistically significant for most crime types. Conversely, the presence of elementary schools is associated with lower levels of property crime at the block group level. Specifically, block groups with elementary schools are expected to have 13.2% fewer burglary incidents and 19.9% fewer larceny incidents than block groups without elementary schools.

Whereas elementary schools are either unrelated or negatively related to crime, the presence of high schools and middle schools tends to have a positive relationship with block group crime counts. Block groups with high schools or middle schools are statistically more likely to report aggravated assaults than block groups without high schools or middle schools. Specifically, block groups with high schools are expected to report 45.2% more aggravated assaults than block groups without high schools, while block groups with middle schools are expected to report 24.9% more aggravated assaults than block groups without middle schools. Block groups with high schools also report significantly more property crime than block groups without high schools, as evidenced by the relationship between high school presence and larceny (block groups with high schools are expected to have 177% more larcenies than block groups without high schools, controlling for other factors). Middle school and high school presence is also related to narcotics incidents. Specifically, block groups with middle schools are expected to report 95% more narcotics incidents than block groups without middle schools, whereas block groups with high schools are expected to report 395% more narcotics incidents than block groups without high schools.

Despite evidence that block groups with elementary schools generally exhibit less crime than those without, whereas those with middle or high

schools exhibit more crime than those without, some of the crimes we examine are unaffected by school presence. Specifically, serious violent crime (like robbery) shows no relation to school presence in these models. Motor vehicle theft is also unrelated to school presence. Not only are some crimes not affected by school presence, most are affected by one type of school presence (e.g., high schools), suggesting that different types of crime may be influenced by different school characteristics.

To assess the fit of these regression models, we also constructed a series of control models that did not include school presence measures. The inclusion of the school presence dummy variables modestly increases the pseudo R^2 values of the regression models. For example, the pseudo R^2 value of the control variable regression model on aggravated assault was .1114, whereas the pseudo R^2 value of the comparable model including the school dummy variables is .1145. Similar small increases are found for the other dependent variables. The results of log-likelihood ratio tests also suggest that the inclusion of the school presence variables improves the regression model fit for several dependent variables. At the block group level, schools appear related to aggravated assault, larceny, and narcotics crime incidents. Schools appear generally unrelated to robbery, burglary, and motor vehicle theft.

Conclusion

The results presented above support several conclusions regarding the relationship between schools and crime. First, our findings support the general contention that schools have some influence on crime at the neighborhood level that is independent of neighborhood structural and demographic context. Although previous research on schools and crime (Gouvis-Roman, 2004; Murray & Swatt, 2010; Roncek & Faggiani, 1985; Roncek & Lobosco, 1983) finds a significant school effect, these studies lack controls for key neighborhood-level predictors of crime, leaving open the possibility that the reported school–crime relationship is spurious. The present study examines the relationship between schools and crime while controlling for key neighborhood predictors. Our findings reinforce the literature showing a relationship between schools and crime by indicating that this relationship is not driven solely by neighborhood-level factors but rather operates largely independent of broader neighborhood-level dynamics.

Our results provide partial support for Hypothesis 1, which stated that schools are related to neighborhood crime controlling for other known structural correlates. The Wald tests of significance for the school presence coefficients suggest that, for certain types of crime, block groups with schools

differ from block groups without schools. Moreover, the log-likelihood ratio tests reported in the results section suggest that the inclusion of school presence variables improves the model fit for the regressions on aggravated assault, larceny, and narcotics incidents above and beyond structural disadvantage, instability, and population demographics. Beyond issues of statistical significance, many of the regression coefficients for school presence are quite large (see, for example, the coefficients for high school presence associated with narcotics violations). Conversely, both the Wald and log-likelihood tests suggest that schools are largely unrelated to robbery, burglary, and motor vehicle theft at the block group level.

Our regression results using school presence indicators suggest that different types of schools have different relationships with crime at the block group level. Specifically, high schools appear to be associated with increases in aggravated assaults, larceny, and narcotics crime at the block group level. Middle schools appear to be associated with increases in narcotics offenses. Elementary schools are generally unrelated to violent crime at the block group level. Additionally block groups with elementary schools have significantly less burglary and larceny, suggesting that elementary schools might provide protection against property crime at the block group level. It should be noted, however, that the burglary results should be viewed cautiously. Whereas the Wald test suggests that elementary school presence is significantly related to burglary, the log-likelihood test indicates that the addition of school presence measures did not significantly improve model fit. In sum, these results provide partial support for Hypothesis 2, which stated that high schools would be associated with more neighborhood crime than middle schools, which, in turn, would be associated with more neighborhood crime than elementary schools.

We believe that our results can be explained using both the routine activities and social disorganization perspectives. The routine activities perspective argues that areas with schools should have higher crime rates due to the convergence of offenders and victims. However, high school aged students are more likely to be both offenders and victims of crime than middle school and elementary school aged children (Farrington, 1986) and are more likely to be unsupervised than younger minors. In terms of the social disorganization perspective, it may be the case that high schools and, to a lesser extent, middle schools promote social disorganization. In fact, Shaw and McKay's (1942) original work on this topic suggested that disorganized areas were characterized by the presence of unsupervised groups of adolescents.

From a routine activity perspective, it is also unsurprising that school presence is unrelated to serious crimes like robbery, burglary, and motor vehicle

theft. Juveniles are more likely to be the offenders and victims of relatively less serious crimes or violent offenses, and thus, the convergence of students at school would not necessarily lead to increases in these more serious violent crimes. That we see an effect of high schools on aggravated assault and narcotics offenses but not more serious violent offenses like robbery supports the routine activities argument that it is the students that converge in and around the school environment that influence crime in that area.

The seemingly protective nature of elementary schools also conforms to the routine activity and social disorganization perspectives. Block groups with elementary schools are likely to be occupied by more families and the families are more likely to be involved in school-related activities (Eccles & Harold, 1996; Hill & Taylor, 2004). This increased involvement may be associated with more social cohesion and higher levels of collective efficacy at the neighborhood level. Moreover, the student-to-teacher ratios tend to be smaller in elementary schools, suggesting a greater degree of supervision (Eccles & Harold, 1996; Hill & Taylor, 2004). This increased level of supervision, when combined with the greater involvement of parents, may make routine activities patterns in neighborhoods with elementary schools less conducive to crime.

Unfortunately, we cannot evaluate these possibilities with the present data. A more complete investigation of the link between school presence and social disorganization would require more direct measures of social disorganization (like neighborhood ties and collective efficacy) and of parent and community involvement in school activities and organizations. A more complete investigation of the link between school presence and routine activities would require additional data on the characteristics of offenders and victims in these neighborhoods, as well as additional data regarding the routine activities of students, parents, and community members.

There are several limitations to this research. First, our data come from a single city. Additional research in different contexts is necessary before any conclusions about the relationship between schools and crime at the block group can be made. Also, this research is largely descriptive in nature. While we have attempted to control for a wide variety of social and economic indicators, it is still possible that other, unmeasured factors account for the relationship between schools and crime at the block group level. Additional research, both in the form of longitudinal quantitative work and qualitative studies, is needed to generate a better understanding of the role that schools play in neighborhood crime. Also, our research may be critiqued for focusing only on relatively serious offenses. While we believe that there are good reasons to study serious crime, future research should also examine the relationship between schools and less serious forms of crime.

The present study examined the relationship between school presence and crime at the neighborhood level. Implicitly, this research suggests that the only important factor for distinguishing between schools is school level. Clearly, both the routine activities and social disorganization perspectives would argue that the quality of schools should also be considered. More effective schools, for example, may promote social organization and promote routine activity patterns that are less conducive to crime than less effective schools. Therefore, future research should work to incorporate the quality of school measures into studies of schools and neighborhood crime.

Our results largely support a routine activities perspective on the relationship between schools and crime. Unfortunately, our data cannot describe the processes through which schools either promote or prevent crime. Therefore, although our findings are supportive of this theoretical tradition, we are unable to verify whether these processes are directly responsible for the link between schools and neighborhood crime. Moreover, because we do not have data on the ages and addresses of offenders in our sample, we are unable to make any definitive claims regarding the offenders within block groups. If the routine activities perspective is correct, it would seem logical that high school and middle school students represent a substantial proportion of the criminal victims and offenders in block groups with schools. Future research on schools and crime should consider the characteristics of offenders within neighborhoods to better specify how and why schools are related to crime.

Despite these limitations, we feel that the present research is valuable both theoretically and practically. This research demonstrates that schools are associated with certain types of crime at the block group level, even after controlling for a number of factors that are known to be associated with crime. In terms of policy, this research suggests that it may, in the short term, be fruitful to focus police efforts on areas near middle schools and high schools. Police presence in these areas may alter the routine activity patterns in the area, making crime less likely, given the increase in capable guardianship. In terms of long-term policy, we believe that the protective influence of elementary schools, when contrasted with the harmful influence of middle and high schools, suggests that schools should actively engage parents and the wider community. While parent and community participation is not the only difference between elementary schools and middle or high schools, it is a factor that can be addressed by school- and community-based policy. Conversely, the other factors that likely contribute to the negative influence of middle schools and high schools on neighborhood crime, like the age distribution of students and the comparatively larger student to teacher ratio, are largely static and immutable. In the very least, future research should investigate

the degree to which community and parent participation mediate or perhaps even reverse the negative relationship between middle school and high school presence and neighborhood crime.

Theoretically, this research contributes to both the routine activity and social disorganization traditions. The positive relationship between high school and middle school presence and certain types of crime gives additional credibility to the explanatory power of the routine activities perspective. The negative relationship between elementary school presence and property crime is evidence that local institutions and physical places can be protective factors at the neighborhood level, thus supporting the view that a more complete view of social organization should include a formalized discussion of the role of local institutions. Taken together, these results suggest that a more complete understanding of the ecology of crime should account for both the social environment (encompassing both the social organization and routine activity patterns of a neighborhood) and the physical environment (the spatial distribution of places).

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Notes

1. The offense “narcotics violations” includes both possession and distribution charges.
2. We also gathered data on a number of variables related to the schools themselves from the Common Core of Data from the U.S. Department of Education. These variables included measures of the student-to-teacher ratio and standardized test performance. Unfortunately, as a number of block groups in Albuquerque do not contain schools, it was not possible to include these variables in their raw numeric form. We attempted a dummy variable approach that compared block groups with no schools to block groups with low, average, and high quality schools. Unfortunately, this approach rendered the high school variables unusable, as the low, average, and high quality high school dummy variable category each contained about 1% of the total observations. Given our hypotheses regarding high schools, we opted to not include this information in the present study.

3. Spatial dependency can result from census jurisdictions in that they may not accurately capture the active units of analysis. For example, suppose crime in a pair of block groups stems from a set of neighborhood processes and structures. If the block groups cut that neighborhood in half, then each of the block groups is expected to have a similar count of criminal incidents. Spatial dependency resulting from spillover suggests that geographic areas affect and are affected by neighboring areas. While conceptually distinct from the problem of artificial jurisdictions, spillover will also result in block groups that are expected to have similar counts of criminal incidents. In both cases, these similarities suggest that crime may not be independently distributed across geographic units.
4. Despite the fact that most block groups in Albuquerque are adjacent to block groups with schools, only 10 block groups contain multiple schools of different levels. The regression results are, in terms of sign and significance, identical when these block groups are omitted from the analysis.
5. This result may seem counterintuitive given the robust individual-level relationship between age and crime that other researchers have found (Hirschi & Gottfredson, 1983). However, this result is not uncommon. A number of researchers have found a negative relationship between youth population and crime at aggregate levels (e.g., see Haynie & Armstrong, 2006; Jackson, 1991; Krivo & Peterson, 1996; Peterson et al., 2000; Steffensmeier & Haynie, 2000). It may be that areas with more minors are also likely to have more families and more community-level supervision, and thus, higher levels of informal social control. Unfortunately, we cannot examine this possibility with the present data.

References

- Anselin, L. (1992). *Spatial data analysis with GIS: An introduction to application in the social sciences*. Santa Barbara: National Center for Geographic Information and Analysis, University of California.
- Block, R. L., & Block, C. R. (1995). Place, space, and crime: A spatial analysis of liquor places. In J. Eck & D. Weisburd (Eds.), *Crime and place* (pp. 145-183). Monsey, NY: Criminal Justice Press.
- Burrow, J. D. (2008). Youth behavior, school structure, and the student risk of victimization. *Justice Quarterly*, 25, 349-380.
- Bursik, R. J. (1988). Social disorganization and theories of crime and delinquency: Problems and prospects. *Criminology*, 26, 519-552.
- Cohen, L. E., & Felson, M. (1979). Social change and crime rate trends: A routine activity approach. *American Sociological Review*, 44, 588-608.
- Duntelman, G. H. (1989). *Principal components analysis*. Newbury Park, CA: Sage University Press.

- Eccles, J. S., & Harold, R. D. (1996). Family involvement in children's and adolescents' schooling. In J. D. A. Booth (Ed.), *Family-school links: How do they affect educational outcomes* (pp. 3-34). Hillsdale, NJ: Lawrence Erlbaum.
- Farrington, D. P. (1986). Age and crime. *Crime and Justice*, 7, 189-250.
- Garofalo, J., Siegel, L., & Laub, J. (1987). School-related victimizations among adolescents: An analysis of national crime survey (NCS) narratives. *Journal of Quantitative Criminology*, 3, 321-338.
- Gouvis-Roman, C. (2004). *Schools, neighborhoods, and violence: Crime within the daily routines of youth*. Lanham, MD: Lexington Books.
- Haynie, D., & Armstrong, D. P. (2006). Race and gender-disaggregated homicide offending rates: Differences and similarities by victim-offender relations across cities. *Homicide Studies*, 10, 3-32.
- Hill, N. E., & Taylor, L. C. (2004). Parental school involvement and children's academic achievement: Pragmatics and issues. *Current Directions in Psychological Science*, 13, 161-164.
- Hirschi, T., & Gottfredson, M. (1983). Age and the explanation of crime. *American Journal of Sociology*, 89, 552-584.
- Jackson, P. I. (1991). Crime, youth gangs, and urban transition: The social dislocations of postindustrial economic development. *Justice Quarterly*, 8, 379-397.
- Kautt, P. M., & Roncek, D. W. (2007). Schools as criminal "hot spots": Primary, secondary, and beyond. *Criminal Justice Review*, 32, 339-357.
- Krivo, L., & Peterson, R. (1996). Extremely disadvantaged neighborhoods and urban crime. *Social Forces*, 75, 619-648.
- LaGrange, T. C. (1999). The impact of neighborhoods, schools, and malls on the spatial distribution of property damage. *Journal of Research in Crime & Delinquency*, 36, 393-422.
- Mosher, C. J., Miethe, T. D., & Phillips, D. M. (2002). *The mismeasure of crime*. Thousand Oaks, CA: Sage.
- Murray, R.K., & Swatt, M. (2010). Disaggregating the relationship between schools and crime: A Spatial Analysis. *Crime & Delinquency*. Advance online publication. doi: 10.1177/0011128709348438.
- Osgood, D. W. (2000). Poisson-based regression analysis of aggregate crime rates. *Journal of Quantitative Criminology*, 16, 21-43.
- Peterson, R., Krivo, L., & Harris, M. A. (2000). Disadvantage and neighborhood violent crime: Do local institutions matter? *Journal of Research in Crime & Delinquency*, 37, 31-63.
- Rand, M. R., & Catalano, S. M. (2007). *Criminal victimization, 2006*. Washington, DC: U.S. Department of Justice.

- Robers, S., Zhang, J., Truman, J., & Snyder, T. (2010). Indicators of school crime and safety: 2010. Washington, DC: U.S. Department of Education and U.S. Department of Justice Office of Justice Programs.
- Roncek, D. W. (1981). Dangerous places: Crime and residential environment. *Social Forces*, 60, 74-96.
- Roncek, D. W., & Bell, R. (1981). Bars, blocks, and crime. *Journal of Environmental Systems*, 11, 35-47.
- Roncek, D. W., & Faggiani, D. (1985). High schools and crime: A replication. *Sociological Quarterly*, 26, 491-505.
- Roncek, D. W., & Lobosco, A. (1983). The effect of high schools on crime in their neighborhoods. *Social Science Quarterly*, 64, 598-613.
- Roncek, D. W., & Maier, P. A. (1991). Bars, blocks, and crimes revisited: Linking the theory of routine activities to the empiricism of "hot spots." *Criminology*, 29, 725-753.
- Roncek, D. W., & Pravatiner, M. A. (1989). Additional evidence that taverns enhance nearby crime. *Sociology and Social Research*, 73, 185-188.
- Sampson, R. J. (1986). Neighborhoods and crime: The structural determinants of personal victimization. *Journal of Research in Crime & Delinquency*, 22, 7-40.
- Sampson, R. J., & Groves, W. B. (1989). Community structure and crime: Testing social-disorganization theory. *American Journal of Sociology*, 94, 774-802.
- Sampson, R. J., Morenoff, J. D., & Gannon-Rowley, T. (2002). Assessing "neighborhood effects": Social processes and new directions in research. *Annual Review of Sociology*, 28, 443-478.
- Sampson, R. J., Raudenbush, S. W., & Earls, F. (1997). Neighborhoods and violent crime: A multilevel study of collective efficacy. *Science*, 277, 918-924.
- Shaw, C. R., & McKay, H. D. (1942). *Juvenile delinquency and urban areas*. Chicago, IL: University of Chicago Press.
- Sherman, L. W., Gartin, P. R., & Buerger, M. E. (1989). Hot spots of predatory crime: Routine activities and the criminology of place. *Criminology*, 27, 27-55.
- Steffensmeier, D., & Haynie, D. (2000). Gender, structural disadvantage, and urban crime: Do macrosocial variables also explain female offending rates? *Criminology*, 38, 403-438.
- Veenstra, R., Lindenbergh, S., Oldehinkel, A., De Winter, A., Verhulst, F., & Ormel, J. (2005). Bullying and victimization in elementary schools: A comparison of bullies, victims, bully/victims, and uninvolved preadolescents. *Developmental Psychology*, 41, 672-682.
- Wilcox, P., Augustine, M. C., Bryan, J. P., & Roberts, S. D. (2005). Reality of middle-school crime: Objective vs. subjective experiences among a sample of Kentucky youth. *Journal of School Violence*, 4, 3-28.

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