

Original Article

Neighborhood parks, evidence of guardianship, and crime in two diverse US cities

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Abstract Research addressing the link between crime and parks has primarily focused on fear of crime with limited empirical research verifying or denying a crime-park relationship. This article examines the results of two nearly identical studies examining the relationship between neighborhood parks and crime, in two very dissimilar cities, Philadelphia, PA and Louisville, KY. These cities vary greatly in size, population density, median income, per cent minorities and per cent living in poverty, among other factors. Findings of the studies, which are grounded in theories of environmental criminology, show that neighborhood parks are associated with increased crime levels in their immediate surroundings. In addition, although characteristics of parks significantly related to crime levels in each city vary somewhat, findings clearly demonstrate the underlying importance guardianship plays in explaining the criminogenic nature of neighborhood parks.

Security Journal (2017) **30**, 807–824. doi:10.1057/sj.2015.11; published online 11 May 2015

Keywords: Parks; guardianship; location quotients; routine activities theory; crime pattern theory

Introduction

City parks were designed to respond to vast urbanization by providing open space for community recreation and activities. However, over the years, parks have come under considerable scrutiny by some who suggest they offer a place for criminal activity to flourish. Research addressing the link between crime and parks has primarily focused on fear of crime with limited empirical research verifying or denying a crime-park relationship. The current study compares findings of two near-identical studies that examine the relationship between neighborhood parks and crime from the geographically and socio-demographically diverse cities of Philadelphia, PA and Louisville, KY. Specifically, we examine the impact of parks on crime and disorder in the neighborhoods immediately adjacent to them and whether specific park features are related to crime and disorder levels. Rather than merely comparing and contrasting the many variables analyzed in each study, this article focuses on the lessons, theoretical and policy oriented, suggested by findings common to both studies.

Philadelphia and Louisville Parks Research

Groff and McCord (2012) reported on the results of an exploratory analysis examining the relationship between 247 neighborhood parks and crime in Philadelphia, Pennsylvania. The article was the first published study to examine the impact of an aggregate number of parks on neighborhood crime and to explore whether specific park features are related to crime levels. Many of the variables in the Philadelphia study proved statistically significant and provided preliminary evidence of a park-crime and park characteristic and crime relationship. However, generalizability of the findings, and thus policy usefulness, were limited since this was the first published research of its nature. In addition, the study was confined to one geographic area, Philadelphia, PA. Philadelphia is a large, densely populated, high crime and high poverty city located in the northeastern United States and is not representative of the average American community.

A near identical study of 60 neighborhood parks in Louisville, Kentucky, a major mid-western City, is compared with findings from the Philadelphia study to better inform on the impact these important, but often controversial land uses have on neighborhood crime and disorder. Louisville is a smaller, higher income and mostly suburban-like city, with a much lower violent crime rate than Philadelphia. As of 2010, Philadelphia's population was more than twice that of Louisville (1 500 000 versus 637 000 respectively) with a total land area one-third the size (134 versus 380 square miles) and a population density over six times higher than Louisville (11 379 versus 1836 residents per square mile). Philadelphia also reports a lower median income compared with Louisville (\$36 000 versus 43 000), with a greater concentration of people living in poverty (25 versus 17 per cent), and nearly twice the number of minorities (63 versus 32 per cent) (US Census Bureau). Crime levels differ considerably between the cities with Philadelphia's violent crime rate nearly twice that of Louisville (11.89 versus 5.85 per 1000 residents respectively based on 2010 figures), but reportedly lower property crime rates (37.08 versus 46.35 per 1000 residents) (Federal Bureau of Investigation, 2011).

As noted above, Philadelphia has 247 neighborhood parks as defined by this study (see the Methods section for the full definition of 'neighborhood park'), while Louisville has 60. Philadelphia averaged 1.8 neighborhood parks per square mile compared with Louisville's 0.15 parks. The average size neighborhood park in Philadelphia is 359 ft² (2.9 acres) and 402 ft² (3.7 acres) in Louisville, about equal to an average square block in each city. Both cities maintain large regional parks and natural areas set aside for resident's enjoyment that were not considered in this study because of its focus on the more frequent smaller parks found within single neighborhoods and designed to be accessed primarily by local residents. Variations in park features are discussed below.

Perceptions of Parks

Parks, as public places, tend to be both praised and vilified. Proponents of parks praise their perceived benefits which include natural open spaces that provide recreation, exercise, and relaxation. Parks further provide settings that bring community members of different economic and social classes together, help form strong community identities, and enhance surrounding property values (Burgess *et al.*, 1988; Reeves, 2000; Chiesura, 2004; Voicu and Been, 2008).



Critics, however, often see parks, especially those in urban areas, as poorly monitored and maintained public places that are too often taken over by the homeless, drug involved, and juvenile delinquents (Westover, 1985; Knutsson, 1997; Hilborn, 2009). Thus, parks are considered frightening places that should be avoided by the law abiding public. Although there has been much written expounding both points of view, relatively little empirical research exists verifying or denying the presence of a park-crime relationship.

Informed by Theory

The analyzes performed in this study of neighborhood parks and crime are informed by theories falling under the rubric of environmental criminology (Brantingham and Brantingham, 1991). Environmental criminology consists of a family of theories that share a common interest in explaining criminal events as the product of the immediate circumstances and environment in which they occur (Wortley and Mazerolle, 2008). The theories of routine activities (Cohen and Felson, 1979) and crime pattern (Brantingham and Brantingham, 1993) prove especially useful in interpreting the results of this two-city park study.

Routine activities theory explains that crime can only occur when a motivated offender and a suitable target converge in a time and place lacking capable guardianship (Cohen and Felson, 1979). Thus, guardianship, or the lack thereof, is particularly important in not only explaining the existence of crime, but also in its prevention. Places of high crime may have many motivated offenders and/or suitable targets, but must also lack capable guardianship. Capable guardianship can be of the potential offender, the suitable target, or the place these two elements converge. Potential offenders can be thwarted from crime when in the company of capable guardians, such as when crime-prone teenagers are accompanied by parents or other responsible adults. Suitable targets can be protected from crime by guardians as when attentive clerks prevent acts of shoplifting and parents protect their children from people who may wish to do them harm. Place guardians include those assigned the responsibility of watching for potential offenders and protecting targets at a location (for example, teachers, doormen, train conductors and security guards). Guardianship at places can also be brought about by the casual activities of other legitimate users of a place (for example, customers, workers) and the general public in the form of bystanders. Studies have shown that the presence of bystanders is often effective in preventing many crimes from occurring (Felson, 1995; Nicksa, 2014).

The guardianship concept of routine activities theory may be especially important in understanding the relationship between parks and crime. Parks as public lands are unique in that they are owned by all, but at the same time owned by no one. Rarely are city employees assigned full-time positions at neighborhood parks and the expectation that the occasional police patrol can provide the level of supervision, surveillance, and security needed in these public places may be unreasonable. Thus, these areas of mostly vacant land found in the center of many residential neighborhoods experience little of the guardianship provided to the surrounding homes and businesses via private ownership. The lack of guardianship allows parks to become the ideal setting to practice undesirable behavior including illicit drug use and sales, muggings, and vandalism, especially during low activity times (nighttime and weekdays during work/school hours) (Hilborn, 2009).

Crime pattern theory is also useful in explaining a park-crime nexus (Brantingham and Brantingham, 1993). Crime generators, as explained by the theory, are places that attract large numbers of people (for example, shopping malls, sporting events), a proportion of which are criminally motivated. Thus, areas with crime generators often experience higher levels of crime. Crime attractors differ somewhat from crime generators. Crime attractors draw a large proportion of motivated offenders for the criminal opportunities present at these locations and include such areas as open market drug sales and bar districts. Similar to crime generators, areas with crime attractors often experience higher rates of crime (Brantingham and Brantingham, 1995a).

Crime pattern theory further posits the concept of awareness space in which potential offenders become aware of criminal opportunities as they move about their daily routine traveling to school, work, home or leisure activities. Observed opportunities are taken advantage of initially or returned to at a future time. Highly visited places and their immediate surrounds, as well as the busy roads and pathways traveled between them, tend to experience more crime because they fall into the awareness space of many potential offenders (Brantingham and Brantingham, 1993).

Drawing from the perspective of crime pattern theory, neighborhood parks and their immediate surroundings may experience higher levels of crime. Potential offenders will be drawn to parks for the criminal opportunities they provide, due mostly to the lack of guardianship. For example, parks can provide good opportunities for drug use and dealing away from the prying eyes of family members and the territorial interests of legitimate businesses and homeowners. Parks are also ideal places for teens to vandalize and settle personal scores away from the control of parents or school administrators. Low levels of police and public surveillance exacerbated by distance from the street, overgrown vegetation, poor lighting and low patron usage make some parks particularly suitable for muggings and sexual assaults. Further contributing to the potential for crime is the draw parks have on people from outside of the immediate area. Some people may travel into a neighborhood solely to use the available park for recreation or sports. In the course of their travels, people who are criminally motivated become aware of crime opportunities in the neighborhood that they would otherwise not have known about had it not been for the presence of the park.

Although parks are by their nature susceptible to criminal activity, not all neighborhood parks will attract crime at the same level. Some parks may be 'adopted' by the surrounding residents and maintained as if it was their own property, though this is probably more likely in neighborhoods of higher social organization (Bursik and Grasmick, 1993). In addition, parks may have features that attract legitimate users increasing guardianship throughout the day. For example, the presence of recreation centers with assigned staff may provide a safe place for youth to gather and play while being monitored and kept out of mischief. Sports fields may encourage the presence of organized athletic teams along with their coaches, parents and spectators. Playgrounds and basic amenities such as benches, drinking fountains, restrooms and parking lots may attract more families and allow them to stay for longer periods of time. In addition, field and walkway lighting may extend guardianship into the nighttime hours by assisting surveillance and encouraging more nighttime activities by legitimate users. The legitimate users attracted to the park by these facilities increase guardianship and informal social control of these public environments. The increased presence of guardians restricts available opportunities of potential offenders and may even keep them away as it minimizes their control and anonymity.



Existing Research

The existing research examining the link between parks and crime is sorely limited. Much of the available literature is anecdotal in nature consisting of media reports or police efforts to deal with problems at specific high-crime parks (see the Problem Oriented Policing website at www.popcenter.org for many examples). Of the available scholarly studies, most examine the relationship between fear of crime and parks, rather than the presence of actual crime or the impact of specific park features on the presence of crime (see Schroeder and Anderson, 1984; Westover, 1985; Hilborn, 2009).

Some research has been conducted examining the association between burglary rates and parks. Findings of these studies revealed that neighborhoods with parks had reportedly higher residential (Herbert, 1982; Evans and Oulds, 1984; Rengert and Wasilchick, 1985; Crewe, 2001; Lockwood, 2007) and commercial burglaries (Hakim and Shachamurove, 1996). Crewe (2001) also found that crime and police calls-for-service were higher at homes immediately adjacent to parks.

Additional research has been conducted which combine parks with other non-residential land uses (restaurants, retail stores, offices, schools and so on) in multivariate examinations explaining crime levels in neighborhoods (Miethe and McDowall, 1993, Perkins *et al*, 1993; Kurtz *et al*, 1998; Wilcox *et al*, 2004; Lockwood, 2007). Although the impact of the non-residential land use on neighborhood crime was generally positive and significant, the specific impact of parks on crime could not be determined because of the mixing of the different types of land use.

The aforementioned Groff and McCord's (2012) study focused specifically on neighborhood parks and used reported incidents of violent, property, and disorder crime as dependent variables. It examined 247 parks in Philadelphia, PA and evaluated over 60 different park features. As the first study of its kind, it was exploratory in nature and used a broad and generalized theoretical approach based in crime pattern theory (Brantingham and Brantingham, 1993), situational crime prevention (Clarke, 2008), and Jacobs' (1961) observations concerning 'eyes on the street' to select features that might correlate with crime. The study found that all three crime types were higher in and around the immediate vicinity of parks and that crime levels decreased as distance from the parks increased, as predicted by theory. Additional and somewhat surprising findings revealed many of the park features suggested by theory to relate to crime levels were non-significant, while others (mainly sports fields) were statistically significant and associated with lower crime rates. Overall findings hinted at the importance of guardianship in explaining park crime, but its exploratory nature, contradictory findings, and the fact that the research was completed in a high crime, very densely populated, post-industrialized city limited its policy implications and the generalizability of the findings.

Current Study

As noted above, scholarly research examining the association between parks and crime is quite sparse despite the vast number of parks throughout the United States. Although some studies have suggested that the presence of neighborhood parks increases the likelihood of burglaries in the surrounding area; our understanding of the impact of parks on other types of crime is sorely lacking. Further, it does not appear that any study to date has addressed the

impact of specific park features as they relate to crime or the prevention of crime, with the exception of the Philadelphia study by Groff and McCord (2012). One study is clearly not sufficient to draw policy implications.

In this article we sought to expand upon current research in several ways. First, we examine violent, property and disorder crimes and do not limit our findings to a specific offense type. Second, we examine crime incidents levels versus fear of crime as it relates to neighborhood parks. And, finally, we narrow our definition of parks to include only local neighborhood parks, omitting larger regional parks. By focusing on local neighborhood parks, we examine parks that routinely lack the guardianship and maintenance of park and recreation staff typically found in larger regional or state parks.

This article presents the statistically significant findings of two nearly identical research studies that examined the relationship between crimes and parks. The studies were conducted in two geographically and socio-demographically diverse large American cities, Philadelphia, PA and Louisville, KY (see Table 1 for a socio-demographic and geographic comparison of the cities). Both of these cities are the center of major metropolitan areas surrounded by smaller suburbs, but otherwise differ in many socio-demographic and physical aspects. Examination of such diverse cities as Philadelphia and Louisville allows for greater generalizability of the results and enriches the robustness of our findings.

Research Questions

Drawing from the findings of the Philadelphia and Louisville parks research, the present study examined two primary research questions. First, what is the impact of parks on crime and disorder in the neighborhoods immediately surrounding them? Second, what specific features of parks relate to crime and disorder levels?

Table 1: Comparison statistics Philadelphia, PA and Louisville, KY

	<i>Philadelphia</i>	<i>Louisville</i>
Population	1 526 006	597 337
Land area in square miles	134	325
Population per square mile	11 380	1837
White population (%)	37	68
Black population (%)	43	23
Hispanic population (%)	9	2
Foreign born persons (%)	12	7
Median income	\$37 192	\$44 159
Persons below poverty line (%)	27	18
Bachelor degree or higher (%)	24	27
Homeownership rate (%)	53	61
Violent crime rate per 1000 residents	11.89	5.85
Property crime rate per 1000 residents	37.08	46.35
Neighborhood parks	247	60
Neighborhood parks average size	359 ft ²	402 ft ²
Neighborhood parks per square mile	1.8	0.15



Methodology

The following section describes the data and statistical methods used in both studies. With the exception of the absence of a few features not found in both cities' parks, the analyzes were performed in an identical matter.

Data

Both studies examine parks designated as 'neighborhood parks' or smaller by the two cities as based on national standards and guidelines (Leon Younger and PROS, 2004; Louisville Metro Parks, 2009). They include parks classified as neighborhood parks, mini parks, squares, and plazas, all of which are less than 10 square acres (0.016 square miles) and meant to provide recreation and open space for local residents living within a service area of a half mile. Excluded from the study are many larger parks commonly classified as community, metropolitan, or regional parks designed to attract users from other neighborhoods, regions, or cities. Each of the cities provided researchers with geographic information system (GIS) shape files that contained park polygons. These were confirmed for completeness via the applicable park department webpages (phila.gov/parksandrecreation, louisvilleky.gov/metroparks). Parks larger than 10 acres were removed from the data resulting in 249 parks in Philadelphia and 60 parks in Louisville.¹

The unit of analysis for each study is the 'park environ' which consists of the park and the streets immediately adjacent and surrounding it (or more specifically a 50 foot buffer surrounding the parks). Park environs are used for both theoretical and practical purposes. The public streets and sidewalks immediately surrounding the parks are part of the situational 'backcloth' in which park crime can occur and thus can be thought of as one environment for the purpose of this study (Brantingham and Brantingham, 1993). In addition, police in both jurisdictions generally fail to use the park address to record crime incidents and instead use a rounded hundred block address or the nearest street corner. Thus it is unclear if a particular crime occurred in the park or on the streets or sidewalks immediately surrounding it. Using park environs as the unit of analysis addresses both these issues.

Crime incident data were provided by the responsible police agencies, the Philadelphia Police Department and the Louisville Metro Police Department.² Violent, property, and disorder crime were collected for calendar years 2005–2006 for Philadelphia, and October, 2008 through September, 2010 for Louisville. *Violent crime* includes all reported murders, rapes, robberies and both aggravated and simple assaults. *Property crime* includes thefts and motor vehicle thefts. *Disorder crime* includes drug and alcohol offenses, weapon violations, prostitution, gambling, vandalisms and disturbances. Only outdoor crime was included in the analyzes as it was more likely to be impacted by the presence of the parks than indoor crimes such as commercial robberies, frauds, shopliftings and domestic violence. Crimes were identified as outdoor by either descriptors in the crime data or by the nature of the crime incident (for example, automobile theft).

Research teams visited and completed systematic surveys (Madden *et al*, 1982; Sampson and Raudenbush, 1999) of the Philadelphia parks between February and August of 2008, and the Louisville parks between November and December of 2010. Information collected included the presence of basic park facilities (recreation centers, playgrounds, restrooms,

parking lots, improved walkways, picnic tables and benches), the number and type of athletic fields and courts (basketball, football/soccer, tennis, volley ball, shuffleboard and horseshoe pits), and additional features such as the presence of walkway lighting, posted park rules, evidence of neighborhood adoption (Neighborhood Watch or Friends of Park signs), and the number of public transportation stops on the perimeter of the parks. Also collected were perceived levels of disorder (litter, graffiti, alcohol and drugs) in the parks and surrounding streets, and the type of land use surrounding the parks (commercial, residential, industrial and mixed).

Analyzes

In both studies, research questions were answered using location quotient (LQ) analysis computed with ArcGIS mapping software (Brantingham and Brantingham, 1995b; McCord and Ratcliffe, 2007, 2009). LQs are spatial ratio statistics that compare the characteristics of a sub area under study with that of the larger, surrounding region and are used extensively in the regional sciences (Miller *et al*, 1991). They are computed as the crime density of the smaller sub area (crime count/area) divided by that of the larger surrounding region (crime count/area). A LQ value of 2.0 would indicate the density of crime in a sub area is twice that of the overall region, while a value of 0.75 would indicate the density is 25 per cent less. Because LQs are ratios, they are not comparable across different study areas (for purposes of this study, the cities of Philadelphia and Louisville).

To answer the first research question concerning the impact of parks on crime in neighborhoods, several different analyzes were utilized to determine if crime clustered in and around the parks. First, as mentioned above, park borders were expanded 50 ft in all directions in the mapping software to capture the sidewalks and streets immediately surrounding them. Crime density (crime count/area in square feet) in these park environs was compared with that of the overall city using LQs. Next, a set of three concentric buffers were drawn around the park environs, each buffer an average city block's length in width (Philadelphia 400 ft, Louisville 500 ft). For the Philadelphia study, the buffers extended out from the park environs from 0 to 400 ft, 400 to 800 ft, and 800 to 1200 ft (see Figure 2 in Groff and McCord, 2012). For the Louisville study, buffers extended from 0 to 500 ft, 500 to 1000 ft, and 1000 to 1500 ft. Crime densities in these buffers were converted to LQs and examined to determine if they decreased in value as distance increased from the park environs as suggested by theory.

LQ analysis is a robust tool but suffers two important limitations. It does not have the ability to easily produce standardized significance tests of the null hypothesis and crime densities of the larger comparison region (cities) are often diluted because they include places at which crime is unlikely to occur (for example, rivers, airport runways, tracts of undeveloped land and so on) (McCord and Ratcliffe, 2009). To address these issues and add rigor to the examination, crime densities (crime count/area in square feet) in the park environs were compared with crime densities surrounding a random set of street intersections selected from throughout each city. By design, intersections are located in the more built up areas of cities making these comparisons a more conservative test than comparing with overall city crime density alone. In addition, this process allows for the use of *t*-tests to determine if crime densities in park environs are statistically different from that found around



the selected intersections. For this analysis, buffers an average city block's length in width (Philadelphia 400 ft, Louisville 500 ft) were drawn around a random set of street intersections selected using the random selection procedure in SPSS. The Philadelphia study utilized 500 random intersections while 400 were selected for the Louisville study based on city size.³ LQ values for the random street intersections are compared with those of the park environs. A finding of statistically higher crime densities surrounding neighborhood parks would increase confidence that the association between parks and crime is because of the presence of the parks.

To answer the second research question as to which park features were related to crime levels, a series of between-group ANOVA tests were utilized. These examinations identified the specific features whose presence in parks were related to statistically higher or lower mean crime density levels as found in the park environs.

Results

The results from the analyzes confirm that crime is more clustered in and around parks than in both cities as a whole. As shown in Table 2, crime densities in the Philadelphia park environs are 2.3 times higher for violent crime, 2.0 times higher for property crime and 2.5 times higher for disorder crimes than the overall city. In Louisville park environs, violent crime is 11.4 times higher, property crime is 3.8 times higher and disorder crime is 18.3 times higher than overall city density. Although the LQ crime values differ between the two cities, disorder crimes are the highest in each, followed by violent crimes, and then property crimes. These initial findings suggest the presence of neighborhood parks attract and/or generate crime in their immediate neighborhood. This impact appears higher for disorder and violent crimes than property crimes.

Theory and logic suggest that if the parks are the primary generators/attractors of crime in their environments then we would expect crime densities to decrease at a monotonic rate as distance increases from them, absent further explanation. On the other hand, if parks repelled crime then crime densities would be expected to increase with distance (Rengert *et al*, 2005). This is of course, a 'perfect world' scenario and variables such as the width of the buffers (here we use an average street block), or perhaps, the regular and systematic placement of parks near certain land uses, such as rivers or shopping centers that can influence crime densities, may impact patterns of crime density leading out from the park environs. In the

Table 2: Location quotients by city and type of crime

	<i>Philadelphia</i>			<i>Louisville</i>		
	<i>Violent</i>	<i>Property</i>	<i>Disorder</i>	<i>Violent</i>	<i>Property</i>	<i>Disorder</i>
Park Environs	2.3	2.0	2.5	11.4	3.8	18.3
Buffer #1	1.7	1.6	2.0	8.4	5.1	8.9
Buffer #2	2.0	1.8	2.3	6.9	4.7	8.3
Buffer #3	1.8	1.6	1.8	4.9	3.9	5.8
Random Intersections	1.6	1.6	1.6	2.5	2.4	2.6

Note: *t*-tests indicate statistical difference at the .05 level for all crime categories in comparison of crime densities in park environs to random intersections for each city. See text.

Philadelphia analysis (see Table 2), we found a slight diversion from the monotonic decrease pattern. For each of the three categories of crime, densities drop considerably from the park environs to the first buffer as expected, but then rise slightly in the second buffer, and drop again in the third. To know whether this is spurious or not requires further analyzes. However, Groff and McCord (2012) provide one possible explanation based on results from an earlier study also conducted in Philadelphia. Rengert (1996) found a similar pattern when examining tax delinquencies as proxies for housing abandonment around a large, illicit street drug market. He found the streets immediately surrounding and adjacent to the drug market had the highest tax delinquencies, streets one block over were considerably lower, while streets further out had higher but steadily decreasing delinquencies. On-site observations revealed high use of territorial markings (better kept yards, flower pots, neighborhood flags and so on) by residents in the first street out from the drug market leading the author to conclude that the residents were trying to fight off the disorder and crime effects of the drug market through the application of territorial markers. Residents, it seemed, were acutely aware of the problems on the street one block over and immediately surrounding the drug market, and therefore made a conscientious effort to prevent this from impacting their street. It is possible that this type of explanation may also explain the crime density pattern found around Philadelphia parks but confirmation is beyond the purview of this study.

In the Louisville analysis, crime densities follow the expected monotonic decrease pattern for violent and disorder crimes with a substantial drop in crime densities from the park environs to the first buffer, and then further steady decreases in the second and third buffers. However, property crime density actually rises in the first buffer, but then steadily decreases in the last two buffers.

A final test of the criminogenic nature of the presence of parks in neighborhoods was to determine if crime densities in the park environs were statistically higher than that found around the intersections in the study cities. As shown in Table 2, LQ values for all three categories of crime, and for both cities, are higher in the park environs than those in the buffers surrounding the random set of intersections. ANOVA tests indicated these differences were all statistically significant at the 95 per cent confidence levels ($p \leq 0.05$). This test is a particularly conservative analysis of the criminogenic nature of neighborhood parks as noted above because intersections are more likely to be found in built-up areas of the cities and thus in proximity to more crime.

A question that needs answering at this point considers whether it is just a few high crime parks that are driving the findings of a positive park-crime relationship, or are most parks in the study cities associated with increased crime levels? This question was answered by examining the distribution of crime across park environs using the LQ values for individual parks. Recall LQ values are ratios with a value of 1.0 indicating the density of park crime is equal to that of the overall city. Values greater than 1.0 would indicate clustering of crime around parks. The Philadelphia study found that 66.6 per cent of the park environs had LQ values greater than 1.0 for violent crime, 70.3 per cent for property crime, and 65.1 per cent for disorder crime. For Louisville, violent crime was 46.7 per cent, property crime was 61.7 per cent and disorder crime was 66.7 per cent. These findings suggest that it was not just a few parks with very high crime levels that were driving the findings of a park-crime relationship in the two cities.

The analyzes thus far have tested the impact of neighborhood parks on crime in two very different cities. Overall findings indicate that the presence of neighborhood parks contribute



to higher levels of crime in both cities, at least for violent and disorder crime. The next set of analysis examined the relationship between park features and crime to determine specific parks features that might serve to attract or generate crime.

Table 3 lists the park features found in both cities by the on-site surveys. Also displayed is the count and percentage of parks that possess these features. As shown, there are commonalities of park features in both cities, but also many significant differences. The majority of parks in Philadelphia and Louisville have benches, playgrounds, and improved walkways. Approximately half have basketball courts and public transit stops on the perimeter, and few parks in either city display evidence of being adopted by neighbor residents. Also noted are the significant differences between the city parks, with more than half of all Philadelphia parks having recreation centers compared with Louisville's mere 5 per cent. In addition, Louisville parks are far more likely to have restrooms, drinking fountains, and parking lots; whereas Philadelphia parks are more likely to have baseball fields, tennis courts, and dual use football-soccer fields. Along with the higher percentage of parks with athletic fields, Philadelphia also has many more sport fields and walkways capable of being lit at night. An overall comparison of park features between the two cities shows Philadelphia's parks tend to be focused more toward sports activities with a much higher presence of athletic fields and night lighting, whereas Louisville's parks tend to have more amenities (restrooms, drinking fountains and parking lots) geared toward more passive uses for individuals and families.

The next set of analyzes examined how the presence of park features impact crime levels. Table 4 reports the result of the ANOVA analysis comparing the mean crime values of parks with the stated feature compared with those without. Results are only shown if the differences were statistically significant. Obvious patterns are noted. As shown, Philadelphia parks that have athletic fields (basketball, baseball, tennis and football/soccer) and night lighting were found to have significantly lower violent, disorder, and property crime levels; a finding not present in the Louisville study. Louisville parks that contain benches, improved

Table 3: Features present in Philadelphia and Louisville parks

<i>Park feature</i>	<i>Philadelphia (n = 249)</i>	<i>Louisville (n = 60)</i>
Recreation Center	129 (52%)	3 (5%)
Benches	222 (89%)	48 (80%)
Playground	172 (69%)	53 (88%)
Improved Walkways	210 (84%)	45 (75%)
Restrooms	5 (2%)	11 (18%)
Drinking Fountains	27 (11%)	25 (42%)
Parking Lots	0 (0%)	22 (37%)
Basketball Court	150 (60%)	30 (50%)
Baseball Field	99 (40%)	13 (22%)
Tennis Court	45 (18%)	8 (13%)
Football/Soccer Field	59 (28%)	8 (13%)
Park Adoption	29 (12%)	9 (15%)
Field Lights	150 (74%) ^a	20 (53%) ^a
Walkway Lights	161 (67%) ^a	15 (33%) ^a
Security Fencing	133 (53%)	0 (0%)
Public Transit on Perimeter	144 (59%)	25 (42%)

^aPercentage of lighting fixtures present in parks with improved walkways and sports fields.

Table 4: Statistically significant relationships between park features and crime

<i>Park feature</i>	<i>Philadelphia</i>		<i>Louisville</i>	
	<i>Mean value with facility (n)</i>	<i>Mean value without facility (n)</i>	<i>Mean value with facility (n)</i>	<i>Mean value without facility (n)</i>
<i>Violent Crime</i>				
Benches	—	—	1.2 (48)**	2.6 (12)
Improved	—	—	1.3 (45) †	2.2 (15)
Walkway				
Restroom	—	—	0.7 (11) †	1.7 (49)
Drinking	—	—	1.0 (25) †	1.8 (35)
Fountain				
Parking Lot	—	—	1.0 (22) †	1.8 (38)
Basketball	2.5 (150) †	3.2 (99)	1.9 (30) †	1.1 (30)
Court				
Baseball Field	2.1 (99)**	3.3 (150)	—	—
Tennis Court	2.0 (45)**	3.0 (204)	—	—
Football/	1.8 (59)**	3.1 (190)	—	—
Soccer				
Field Lights	2.5 (150)*	3.4 (51)	—	—
Public Transit	—	—	2.2(25)**	0.9 (35)
<i>Property Crime</i>				
Parking Lot	—	—	0.9 (22)*	1.6 (38)
Basketball	2.3 (150)*	3.2 (99)	—	—
Court				
Baseball Field	2.1 (99)**	3.1 (150)	—	—
Tennis Court	2.1 (45) †	2.8 (204)	—	—
Football/	1.8 (59)**	2.9 (190)	—	—
Soccer				
Park Adoption	3.7 (29)*	2.5 (220)	1.2 (9)*	2.2 (51)
<i>Disorder Crime</i>				
Recreation	3.0 (129)*	4.5 (120)	—	—
Center				
Benches	—	—	1.5 (48)*	2.7 (12)
Improved	—	—	1.5 (45)*	2.5 (15)
Walkway				
Basketball	—	—	2.2 (30)*	1.4 (30)
Court				
Baseball Field	2.1 (99)**	4.8 (150)	—	—
Tennis Court	2.4 (45) †	4.0 (204)	—	—
Football/	1.6 (59)**	4.4 (190)	—	—
Soccer				
Field Lights	2.8 (150)**	5.3 (51)	—	—
Walkway	3.2 (161)*	4.9 (79)	—	—
Lights				
Public Transit	3.1 (145)*	4.6 (104)	2.6(25)**	1.2 (35)

†p<0.10, *p<0.05, **p<0.01, ***p<0.001



walkways, restrooms, drinking fountains and parking lots tended to have significantly lower violent and disorder crime levels, a finding that did not hold true for Philadelphia. Additional findings indicate that the presence of public transit stops on the perimeter of Louisville parks are associated with higher violent and disorder crime levels, but lower disorder levels in Philadelphia.

Discussion

Parks have been cited for their economic, health and environmental benefits, as well as their social value (Eastern Kentucky University, n.d.). Homeowners enjoy the increased property values associated with parks and the quality of life they bring to their communities. Although parks are often touted as a factor considered in the most 'livable' communities, they are thought by some to be a breeding ground for crime.

The research to date examining the link between parks and crime has generally focused on fear of crime with relatively little empirical research verifying or denying the presence of a park-crime relationship. The current study addresses this gap by examining the link between neighborhood parks and crime drawing from two geographically and socio-demographically diverse cities. This study also expands upon extant literature on the impact of specific park features on crime.

At the outset of this study, we proposed two primary research questions: What is the impact of parks on crime and disorder in the neighborhoods immediately surrounding them? What specific features of parks relate to crime and disorder levels? In response to the first research question, the results of our initial LQ analysis revealed all three categories of crime (that is, violent, property and public disorder) were significantly more clustered in and around park environs in both Philadelphia and Louisville compared with their overall respective cities. These findings were particularly notable for violent and disorder crimes (2.3 times higher for violent crime; 2.5 times higher for disorder crimes in Philadelphia and 11.4 times higher for violent crime; 18.3 times higher for disorder crimes in Louisville). Additional analysis using a more robust method comparing crime densities of parks with intersections in the study cities, also confirmed the three categories of crimes to be significantly higher in the park environs. To confirm that our findings were not confined to a few high crime parks, we examined the distribution of crime across individual park environs using LQ values. The results showed that higher crime density was not limited to a few high crime parks; rather the majority of parks in both cities had higher densities of crime than the overall city that made up the study area.

Our second research question asked if specific features of parks were related to crime and disorder levels. Results indicated that athletic fields and the presence of outdoor lighting fixtures were related to lower crime levels in Philadelphia, while general amenities, including benches, improved walkways, drinking fountains and parking lots were correlated with statistically lower crime levels in Louisville.

The results from both cities clearly demonstrate the presence of parks in neighborhoods as producers of crime. We suggest our findings can be explained within the framework of routine activities theory and further supported by crime pattern theory. Routine activity theory posits that for crime to occur there must be a convergence of three elements in time and space: motivated offender, suitable target and the absence of capable guardianship

(Cohen and Felson, 1979). Our results suggest the importance of guardianship in explaining the crime-park relationship. Neighborhood parks offer an ideal venue for the convergence of motivated offenders and suitable targets in conditions of low guardianship. In order to simulate a naturalistic setting, parks are typically set back from the street with an abundance of trees and flora reducing visibility from passersby and the police (Hilborn, 2009). Because public parks have no defined ownership, the more attentive guardianship typically afforded private property is not found in neighborhood parks. And, because of their small size and limited service area, few neighborhood parks have assigned full-time city staff. In addition, there may be a temporal component to the role of guardianship on crime in neighborhood parks; low patronage during school/work hours, and during nighttime hours, restricts the available informal guardianship from legitimate users to just a few hours during the weekdays and daylight hours during the weekend.

Crime pattern theory provides further explanations for the findings concerning the criminogenic nature of these land uses. It suggests that low levels of guardianship may specifically attract potential offenders because of the crime opportunity it provides, and that these and other criminally motivated but legitimate users of the parks from outside the area, may take advantage of crime opportunities found in the neighborhood while traveling to and from the park. Perhaps it should not be too surprising that most of these large areas of publicly owned and mostly vacant land, prominently located in the middle of residential neighborhoods characterized by private ownership and guardianship, are the crime generators and attractors this two-city study shows them to be.

Although the specific features found to moderate the criminogenic effect of parks differed between the study cities, they too imply the importance of guardianship. Certain park features appear to act as activity generators attracting large numbers of legitimate users. The higher presence of legitimate users may act as capable guardians thus reducing crime. Specifically, in Philadelphia we found the presence of athletic fields and the use of night lighting that can promote organized sports associated with lower levels of violent, property and disorder crimes. According to the information posted on the Philadelphia Parks and Recreation website (phila.gov/parksandrecreation), the majority of the neighborhood parks in Philadelphia with athletic fields host organized sports throughout the year, thus encouraging the presence of large numbers of legitimate users (players, coaches, parents and spectators). The frequency which organized sports teams use their local parks increases natural surveillance and may create a sense of protectiveness and quasi-ownership affording a stronger sense of guardianship. The use of lighting in Philadelphia parks also promotes legitimate users to remain into the nighttime hours extending the presence of informal guardianship. Louisville parks have far fewer athletic fields and lighting fixtures with organized sports teams playing mostly in one of four regional parks (louisvilleky.gov/metroparks). Thus, Louisville neighborhood parks do not benefit from the additional patronage, guardianship, and reduced crime these activity generating facilities appear to provide. However, the greater number of benches, restrooms, drinking fountains and parking lots found in Louisville but not Philadelphia parks, may entice individuals and families to come and stay for longer periods of time, adding informal guardianship and explaining the association with lower crime experienced by Louisville parks containing these facilities.

Perhaps, not surprisingly, disorder crimes were found to have the highest LQ scores in both cities, followed by violent and then property crimes. Neighborhood parks provide an ideal location for drug and alcohol offenses, weapons violations, prostitution, gambling



and vandalism away from the guardianship and territorial protective behavior promoted by home or business ownership. Similarly, the low visibility, lack of lighting, and limited guardianship provides ample opportunity for violent crime, particularly in the evening and during work and school hours. Property crimes may be lowest because neighborhood parks with their limited buildings and patronage during much of the day have few suitable targets to steal or damage. This crime reduction is tempered, however, by the motivated offenders drawn into the neighborhood to utilize the park who then become aware of theft opportunities in the surrounding streets that they would otherwise have not known about.

Limitations

Although this study furthers our understanding of the park-crime relationship and the moderating effect of specific park features on crime, some limitations must be addressed. First, it addresses only neighborhood parks and thus has nothing to say about the larger community and regional parks that stretch across many neighborhoods, are often assigned full-time city staff, and may contain different types of activity generators (for example, lakes, horseback riding). Any park-crime relationship, if present, may differ substantially from the smaller neighborhood parks examined in these studies that are designed for local use and monitoring. Second, there is a need for multiple regression analysis, including interaction analysis, to examine factors such as those already identified, while including control factors such as neighborhood demographics and collective efficacy, and land use. All neighborhoods are not alike and a better defined model may add to a better understanding of how the presence of parks impacts their environments. A final limitation of note is that because crime data and on-site observations for Philadelphia and Louisville were not completed in the same years, we were not able to control for possible changes in park amenities that may have occurred as the crime data was collected.

Policy Implications

Our findings support a small body of research suggesting that neighborhood parks act as crime generators. Crime was concentrated across a significant subset of parks in both Philadelphia and Louisville suggesting the independent effect of parks to influence crime in neighborhoods. Our study was conducted in two diverse urban environments enhancing the validity and robustness of the results not previously seen. On the basis of the common findings of both cities, we suggest the importance of policies specifically aimed at reducing the criminogenic influence of neighborhood parks through better guardianship.

First, to increase formal guardianship, local police should be made more aware of the criminogenic nature of neighborhood parks and be encouraged to include high visibility patrols and walk-throughs as part of their normal routine. In addition, police should be encouraged to consider parks an important part of their patrol and be provided accurate crime data of the types of offenses and disorder that are occurring (Hilborn, 2009). Second, informal guardianship should be promoted through the 'adoption' of parks by the surrounding neighborhood through such programs as 'park watches' organized through the local police department. Renaming the park via community input, park clean-up days,

scheduling local festivals in the park and allowing community gardens in the park may all increase a sense of ownership and responsibility for the park as well as promoting the community's sense of place (Hilborn, 2009). If the community is actively involved with their park, they are more likely to watch over it and perceive it as a place of safety and not a place to be avoided (Hilborn, 2009).

Long-term policies should focus on park design, features and maintenance. Community and park planners should focus on increasing visibility to reduce the sense of isolation often associated with parks, ensure accessibility for multi users including the handicapped and elderly, and employ lighting to illuminate sports fields, pathways, seating and parking lots. Maintenance of park grounds and buildings is important to providing a sense of safety to legitimate users, and evidence of control to potential offenders. Parks should act as multi-use spaces to attract large and varied users to the park. Planners should design parks with sport fields and courts that attract organized sports leagues and with lighting to allow night games. Communities and local businesses could participate through team sponsorships promoting the use of parks. The addition of restrooms and drinking fountains will allow visitors to remain for longer stays enhancing capable guardianship.

As Hilborn (2009) points out, studies of parks demonstrate that many fall into states of disorder gradually through a lack of attention to minor or perceived 'soft' crime (p. 12). This arguably creates a 'trickle down' effect as increased disorder leads to perceptions of fear by legitimate users and the subsequent loss of legitimate guardianship. Thus, it is important that minor offenses or signs of disorder be responded to in a swift and efficient manner sending the message to motivated offenders that this park is cared for and crime will not be tolerated. For the few neighborhood parks that have experienced high crime over a long period of time, Problem Oriented Policing strategies should be encouraged.

Conclusion

The results of our two city study demonstrate neighborhood parks act as crime generators. However, the criminogenic effect appears to be moderated by park characteristics that serve as activity generators, thus promoting guardianship. Future research is needed to further our understanding of the park-crime relationship but it does appear that a 'build it (properly) and they will come' may well-apply to neighborhood park users, and the guardianship and security they provide.

Notes

- 1 The Louisville study originally identified 61 neighborhood parks but two separated by a small residential street were merged into one park for the analysis.
- 2 In 2003, Jefferson County and its largest city, Louisville, merged and formed a single governmental agency, Louisville Metro. Several small communities within the county opted out of the agreement and continue to provide their own local government services, including police services. The LMPD was formed at the time of the merger and polices approximately 90 per cent of the population and area.
- 3 The number of street corners selected for each city was based on the estimate by an online sample size calculator to ensure a minimum confidence level of 95 per cent and confidence interval of 5 per cent. These estimates were rounded up to the closest hundred cases.



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