

CRIMINOLOGY

THE 2014 SUTHERLAND ADDRESS

THE LAW OF CRIME CONCENTRATION AND THE CRIMINOLOGY OF PLACE*

DAVID WEISBURD

Department of Criminology, Law and Society, George Mason University,
Institute of Criminology, The Hebrew University

KEYWORDS: crime concentration, unit of analysis, hot spots, microgeographic, crime places

According to Laub (2004), criminology has a developmental life course with specific turning points that allow for innovations in how we understand and respond to crime. I argue that criminology should take another turn in direction, focusing on microgeographic hot spots. By examining articles published in Criminology, I show that only marginal attention has been paid to this area of study to date—often termed the criminology of place. I illustrate the potential utility of a turning point by examining the law of crime concentration at place, which states that for a defined measure of crime at a specific microgeographic unit, the concentration of crime will fall within a narrow bandwidth of percentages for a defined cumulative proportion of crime. By providing the first cross-city comparison of crime concentration using a common geographic unit, the same crime type, and examining a general crime measure, I find strong support for a law of crime concentration. I also show that crime concentration stays within a narrow bandwidth across time, despite strong volatility in crime incidents. By drawing from these findings, I identify several key research questions for future study. In conclusion, I argue that a focus on the criminology of place provides significant opportunity for young scholars and has great promise for advancing criminology as a science.

In his presidential address to the American Society of Criminology in 2003, John Laub (2004) observed that criminology as a discipline could be viewed as having a developmental life course. In turn, much like the offenders that he and Robert Sampson studied in identifying life-course criminology (Laub and Sampson, 2003), this life course had important turning points that fundamentally influenced the directions that the field would take. In contrast to continuity in the intellectual trajectory of the discipline, a turning point

* This article is based on my Sutherland Lecture at the American Society of Criminology meetings in San Francisco in 2014. I want to thank Breanne Cave, Matthew Nelson, Shai Amram, and Alese Wooditch for their assistance in preparing this address. I am especially indebted to Alese Wooditch who helped me prepare the data and develop the analyses for examination of crime concentration across cities. I also want to thank Barak Ariel, Anthony Braga, Frank Cullen, Charlotte Gill, Liz Groff, Joshua Hinkle, John Laub, Stephen Mastrofski, and Daniel Nagin for their thoughtful comments on the article. Direct correspondence to David Weisburd, George Mason University, 4400 University Drive, MS D12, Fairfax, VA 22030 (e-mail: dweisbur@gmu.edu).

refers to a radical new way of viewing criminology, which allows us to stake out new territory and to make significant new discoveries about crime and criminality. My argument in this article is that it is time for criminology to take another turn in direction. The change is embedded not in a particular theory but in the units of analysis that criminologists focus on. The first major turning point that Laub (2004) identified in American criminology was also concerned with units of analysis. The fundamental changes in our understanding of the crime problem that came from the Chicago School of Criminology were linked strongly to their insights about the importance of communities in understanding crime (e.g., Shaw and McKay, 1942). In this article, I suggest a new turning point, not about communities but focused instead on microgeographic crime hot spots.

The study of crime at microgeographic units of analysis began to interest criminologists in the late 1980s (Evans and Herbert, 1989; Felson, 1987; Pierce, Spaar, and Briggs, 1988; Sherman, Gartin, and Buerger, 1989; Weisburd and Green, 1994; Weisburd, Maher, and Sherman, 1992). In 1989 in *Criminology*, Lawrence Sherman, Patrick Gartin, and Michael Buerger coined the term *criminology of place* to describe this new area of study. The criminology of place (see also Weisburd, Groff, and Yang, 2012) or *crime and place* (see Eck and Weisburd, 1995) pushes us to examine very small geographic areas within cities, often as small as addresses or street segments (a street from intersection to intersection), for their contribution to the crime problem. It pushes us to examine and understand why crime occurs at specific places rather than focusing our interests on the more traditional concern of criminologists with why specific types of people commit crime.

I begin by presenting data on the dominant units of analysis in criminology. By drawing from an examination of the journal *Criminology*, I find that person-focused studies have dominated the attention of criminologists and that studies of crime at place have played a very minor role in criminological research to date. I then turn to what may be termed the first law of the criminology of place—the *law of crime concentration*—to illustrate the tremendous potential of this approach for enhancing our understanding of crime and our ability to inform crime control policies. In conclusion, I argue that a turning point focusing on microgeographic hot spots is warranted in criminology because it can enhance criminology as a science—an enterprise very much in the spirit of Edwin Sutherland.

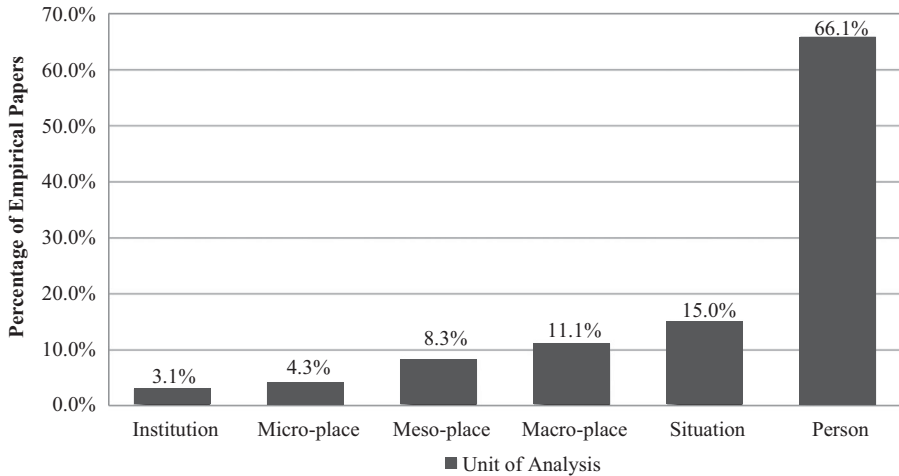
UNITS OF ANALYSIS IN EMPIRICAL CRIMINOLOGY

What have been the dominant units of analysis in research in criminology? My students and I investigated this question by looking at units of analysis in empirical studies published in *Criminology* between 1990 and 2014.¹ We focus on *Criminology* because it consistently is the highest impact journal in the field according to Thomson Reuter's Institute for Scientific Information Index, and it is the main journal of the largest and most influential professional association in criminology. We identified a total of 719 empirical articles in the journal over the last 25 years.²

Figure 1 reports on the percentage of empirical studies that were found to examine each unit of analysis. Because multiple units of analysis were reported in 121

-
1. I want to thank Breanne Cave, Matthew Nelson, and Alese Wooditch for their work on collecting these data.
 2. Approximately 7 percent of the articles had no empirical units and are not included in our count. These were generally discussions of theory or nonempirical pieces, such as presidential addresses to the society.

Figure 1. Units of Analysis in Empirical Articles in *Criminology* 1990–2014 ($N = 719$)^a



^aIn 15.5 percent of the articles, multiple units were identified. In such cases, we counted the article as including each unit that was noted. Accordingly, the percentage estimates in the figure represent the percentage of the total number of empirical articles that included that unit.

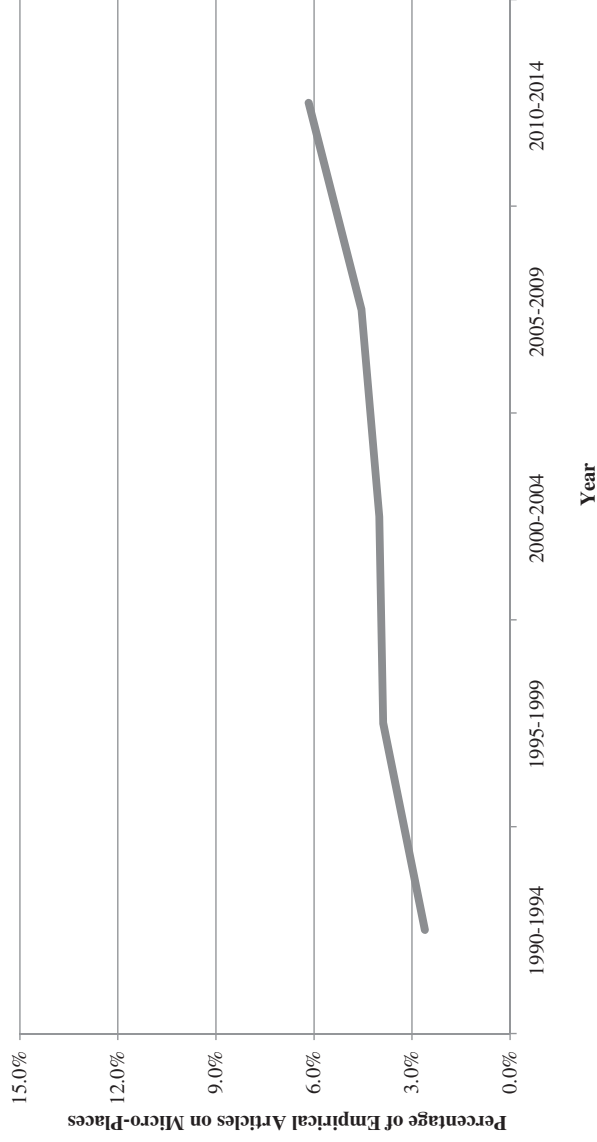
articles, the total proportion is greater than 100 percent. Not surprisingly, the dominant unit of analysis in empirical studies in *Criminology* is people. Two-thirds of the articles in *Criminology* focus on people. Mesogeographic units (such as census tracts, census block groups, and neighborhoods) were examined in 8 percent of the articles, and macro-units (including cities, counties, and states) were examined in 11 percent of the articles. Perhaps reflecting another turning point in criminology at the turn of the last century, situations are a focus of 15 percent of the articles in *Criminology*. But only 4 percent of the articles examined micro-units, such as addresses, facilities (e.g., schools and bars), street segments, or small clusters of street segments. Clearly, the discipline of criminology has not focused significant attention on microgeographic units of analysis.

Looking at the trend across time, there is indication of a growing interest in the criminology of place (figure 2). Only 2.6 percent of the articles in *Criminology* in the early 1990s focused on microgeographic units of analysis. However, between 2010 and 2014, more than 6 percent of articles examined microgeographic hot spots. Although this finding suggests a growing trend of interest, it is still the case that the criminology of place occupies a very small part of empirical study in criminology. The question remains: Why should there be a turning point that would focus on microgeographic units of analysis?

LAW OF CRIME CONCENTRATION AT PLACE

Perhaps the first and most important empirical observation in the criminology of place is that crime concentrates at very small units of geography (Weisburd and Amram, 2012; Weisburd et al., 2012). This finding is the catalyst not only for the emerging interest in

Figure 2. Changes in Rates of Microplace Studies Across Time



this area in the 1990s but also for the development of crime prevention programs at places, such as hot spots policing (Sherman and Weisburd, 1995). Many studies since the late 1980s have found that there is significant clustering of crime at microgeographic units of analysis (see Andresen and Malleson, 2011; Braga, Papachristos, and Hureau, 2014; Brantingham and Brantingham, 1999; Crow and Bull, 1975; Curmen, Andresen, and Brantingham, 2014; Pierce, Spaar, and Briggs, 1988; Roncek, 2000; Sherman, Gartin, and Buerger, 1989; Weisburd and Amram, 2014; Weisburd et al., 2004; Weisburd and Green, 1994; Weisburd, Lawton, and Ready, 2012; Weisburd, Maher, and Sherman, 1992; Weisburd, Morris, and Groff, 2009). However, studies to date have varied widely in the geographic units used, the type of crime data (e.g., calls for service and crime incidents), and the types of crimes examined.

Two early studies examining street addresses and general measures of crime found strikingly similar outcomes. Sherman, Gartin, and Buerger (1989; see also Sherman, 1987) in an analysis of emergency calls to street addresses found that only 3.5 percent of the addresses in Minneapolis produced 50 percent of all crime calls to the police in a single year. Similarly, Pierce, Spaar, and Briggs (1988) found that 3.6 percent of street addresses in Boston included 50 percent of emergency calls to the police. Eck, Gersh, and Taylor (2000) also examined crime calls at addresses and found that the most active 10 percent of places (in terms of crime) in the Bronx and Baltimore accounted for approximately 32 percent of a combination of robberies, assaults, burglaries, grand larcenies, and auto thefts. Looking at public places, such as high schools, public housing projects, subway stations, and parks, Spelman (1995) found that the worst 10 percent of locations produced 50 percent of crime calls.

Other scholars have looked at crime incidents at street segments or clusters of street segments. A study conducted by Weisburd et al. (2004) confirms not only the concentration of crime at place but also the stability of such concentration across a long time span. Weisburd et al. examined street segments in the city of Seattle from 1989 through 2002. They found that 50 percent of crime incidents over the 14-year period occurred at only 4.5 percent of the street segments. Curman, Andresen, and Brantingham (2014) also examined crime incidents in Vancouver, BC, Canada, at the street segment using incident data. They found that 7.8 percent of street segments produce 60 percent of crime and that crime patterns at high rate places are relatively stable across time. Weisburd and Mazerolle (2000) studied drug markets, which often included clusters of street segments. They found that approximately 20 percent of all disorder crimes and 14 percent of crimes against persons were concentrated in just 56 drug hot spots in Jersey City, New Jersey, an area that comprised only 4.4 percent of street segments and intersections in the city (see also Weisburd and Green, 1995).

Some studies reported crime concentration for specific types of crime. In Sherman, Gartin, and Buerger's (1989) original work, they also documented crime concentrations by specific crime types. All robbery calls came from only 2.2 percent of places in the city, all motor vehicle thefts came from 2.7 percent of places, and all rape calls came from 1.2 percent of places. Even some crimes that would perhaps seem less likely to concentrate so dramatically like burglaries, assaults, and domestic disturbances also were found to show high levels of concentration at the microgeographic level. All burglaries came from 11 percent of places, all assaults came from 7 percent of places, and all domestic disturbances came from 9 percent of places. Whereas study of crime concentration for specific crimes often has been hindered because of low base rates in microgeographic areas, more

recent study of specific crime types also shows strong evidence of high levels of concentration (Braga, Hureau, and Papachristos, 2010; Townsley, Homel, and Chaseling, 2003). For example, in Boston, Braga, Hureau, and Papachristos (2010) examined incidents of gun violence between 1980 and 2008. They found incidents of gun violence were stable and concentrated at less than 5 percent of street segments and intersections. They also reported (Braga, Hureau, and Papachristos, 2011) that between 1 percent and 8 percent of street segments and intersections were responsible for nearly 50 percent of all commercial robberies and 66 percent of all street robberies. In studying juvenile crime hot spots, Weisburd, Morris, and Groff (2009) found that only 86 street segments of approximately 25,000 in Seattle accounted for one-third of all official juvenile crime over a 14-year period.

These studies have established clearly that crime is concentrated at microgeographic units. But it is difficult to draw strong conclusions regarding the extent to which there are similarities in crime concentration across cities because of the varied nature of the units of analysis, types of data, and types of crime examined. Is there a tight bandwidth of concentration of crime suggesting a specific scientific principle that holds in similar magnitudes across a variety of circumstances? If so, then it would be possible to develop a law to this effect. The generally established criterion of a *physical law* as defined by the Oxford English Dictionary (Physical law, 2010) is as follows: “A physical law is a principle deduced from particular facts, applicable to a defined group or class of phenomena, and expressible by the statement that a particular phenomenon always occurs if certain conditions be present.” In this context, I present data to suggest that there is a *law of crime concentration*. This law states that *for a defined measure of crime at a specific microgeographic unit, the concentration of crime will fall within a narrow bandwidth of percentages for a defined cumulative proportion of crime.*³

A defined measure of crime is necessary because crime concentration may vary depending on the types of crimes and nature of the crime data examined. For example, as illustrated previously, earlier studies have looked at broad general measures of crime as well as at specific types of crime, and they have examined emergency calls to the police, crime victimization, and crime incidents. In turn, crime concentration may fluctuate according to the specific microgeographic unit of analysis examined, from addresses or facilities to clusters of street segments or defined geographic buffers. Scholars have argued generally that crime concentrates at microgeographic units (Weisburd et al., 2012; Wilcox and Eck, 2011). A law of crime concentration predicts that the range in percentage of microgeographic units—what I term *bandwidth* of percentages—that is associated with a specific *cumulative proportion of crime* (for example, 25 percent or 50 percent of crime in the city) would be very narrow for a standard unit of crime and geography. The subsequent analyses represent an initial attempt to define the bandwidth of the law of crime concentration across cities and across time.

SAMPLE OF CITIES

I was able to gather crime data on eight cities coded at the same geographic unit (the street segment), using the same type of data (crime incidents), and the same measure of

3. My colleagues and I have stated a more general proposition about crime concentrations in earlier work (see Weisburd and Amram, 2014; Weisburd et al., 2012; see also Wilcox and Eck, 2011).

crime (a broad general measure, as will be discussed). Data from some of these cities were available because of my involvement in prior or ongoing studies. Data on three cities (Cincinnati, Ohio; Redlands, California; and Ventura, California) were generously provided by colleagues (table 1). Five cities are what we would ordinarily term “large” cities (table 2) with populations ranging from approximately 300,000 people (Cincinnati) to more than 8,000,000 (New York City). Three cities are small cities, less urbanized than the larger cities, including populations ranging from approximately 70,000 (Redlands) to 108,000 (Ventura) people. The time range of the data available in the cities ranged from 1 year to 21 years.

This sample is not random but one of convenience. Nonetheless, this is not only the first time that anyone has examined crime concentration across cities using similar methods and metrics, but also the cities vary greatly in character. The cities studied are very different in the size of their populations and in many other characteristics (table 2). In terms of scale, the larger cities vary in the number of street segments between 13,550 (Cincinnati) and 87,279 (New York). The average length of street segments varies between 183 feet (Tel Aviv-Yafo) and 445 feet (Cincinnati). The smaller cities vary less and overall include many fewer street segments (2,937 to 4,674), which are in general much longer (596 to 681 feet).

Crime rates also vary greatly across the cities, as do social characteristics. Among the larger U.S. cities, violent crime rates vary between 6 per 1,000 population in Seattle and 9.7 per 1,000 in Cincinnati. Tel Aviv-Yafo’s serious crime index cannot be compared directly with those of the U.S. cities because of differences in crime classifications, but it reflects an overall very low rate of violent crime. Among the smaller cities, the rates vary between 2.9 and 3.4 per 1,000 population. In terms of racial composition, Seattle, Washington, is only 7.9 percent African American, whereas almost half of Cincinnati’s population is African American. Only 4.2 percent of Tel Aviv-Yafo’s population are Arab minority citizens. In terms of percentage of the city below the poverty level, Seattle and Tel Aviv-Yafo both have approximately 14.0 percent of the population below the poverty level, whereas Cincinnati has more than 30 percent. Among the smaller cities, we also see large variation in the percentage African American, ranging between 2.2 percent and 24.4 percent.

Accordingly, although the cities we look at are not representative of a specific population of cities as described previously, they have a broad array of characteristics, including being spread geographically across the United States and including one non-U.S. city, Tel Aviv-Yafo. If we find strong consistency across such a diverse group of cities, then it is reasonable to draw an inference regarding the general application of a law of crime concentration at place.

TYPE OF CRIME DATA AND TYPES OF CRIME

I use computerized records of written reports, often referred to as crime incident reports, to examine crime trends. Incident reports are generated by police officers or detectives after an initial response to a request for police service. In this sense, they represent only those events that were both reported to the police and deemed worthy of a crime report by the responding officer. Incident reports are more inclusive than arrest reports but less inclusive than emergency calls for service—which include all events reported to the police whether they are confirmed or not. The number of crime incidents across the cities

Table 1. Description of Crime Concentration Data^a

Characteristics	Large Cities					Small Cities		
	Cincinnati, OH	Seattle, WA	Tel Aviv-Yafo	New York, NY	Sacramento, CA	Brooklyn Park, MN	Redlands, CA	Ventura, CA
Investigators	Lee, Eck, Engel, Ozer, and Deryol	Weisburd, Groff, and Yang	Weisburd and Amram	Weisburd, Wooditch, Weisburd, and Yang	Telep, Mitchell, and Weisburd	Weisburd, Gill, and Wooditch	Taniguchi	Dario, Morrow, Wooditch, and Vickovic
Time period	2009	1989–2004	1990–2010	2004–2012	2012	2000–2013	2012–2013	2011
Yearly crime incidents on street segments	34,006	106,076	32,361	376,856	33,196	14,327	5,841	14,299
Percentage of crime at intersections	6.9%	15.7%	.0%	20.2%	16.9%	5.9%	33.2%	11.0%

^aI want to thank YongJei Lee and John Eck (for Cincinnati), Lisa Dario (for Ventura), Shai Amram (for Tel Aviv-Yafo), and Travis Taniguchi (for Redlands) for generously providing data for this article.

Table 2. Characteristics of Cities Included in the Analysis^a

City Characteristics	Large Cities				Small Cities			
	Cincinnati, OH	Seattle, WA	Tel Aviv-Yafo	New York, NY	Sacramento, CA	Brooklyn Park, MN	Redlands, CA	Ventura, CA
Population	296,204	626,865	414,600	8,289,415	476,577	77,346	70,399	108,511
Number of street segments	13,550	24,023	14,149	87,279	22,867	2,937	4,674	4,568
Average length of street segment	445 ft	387 ft	183 ft	393 ft	416 ft	596 ft	678 ft	681 ft
Number of violent crimes per 1,000	9.7	6.0	3.61 ^b	6.4	7.4	3.4	3.1	2.9
Percentage African-American	44.8%	7.9%	4.2% ^c	25.5%	14.6%	24.4%	5.2%	2.2%
Percentage below poverty level	30.4%	13.6%	14.0%	20.3%	21.9%	12.3%	12.5%	11.1%

^aPopulation estimates and the number of yearly violent crimes were obtained from *Crime in the United States* from the U.S. Department of Justice (2012), Federal Bureau of Investigation's Uniform Crime Reporting (UCR) Program for 2012. Violent crime data include four offense types: murder, forcible rape, robbery, and aggravated assault. As a result of noncompliance with data collection methodology of Minnesota, forcible rape totals are not provided by the UCR and therefore were collected from the State of Minnesota's UCR (Minnesota Department of Public Safety, 2012). Data on percentage African American and below poverty level were obtained from the U.S. Census Bureau for 2009–2013. The poverty rates for Tel Aviv-Yafo were obtained from *Jerusalem: Facts and Trends* (Choshen and Korach, 2010) for 2008. Other data for Tel Aviv-Yafo were obtained from the government of Tel Aviv's (2013) website: http://www.tel-aviv.gov.il/TheCity/Documents/תדירות_החומר_2013

^bThe violent crime rate for Tel Aviv-Yafo comes from the Ministry of Public Security's Index of Serious Crimes, and it was provided by the Ministry. The Index includes murder, assault, manslaughter, attempted murder, and serious injury. Caution should be used in comparing these data with the UCR statistics for violent crimes in U.S. cities.

^cReflects the percentage of the population that is Arab.

varies considerably. Among the larger cities, New York has by far the most crime incidents occurring on street segments in an average year ($N = 376,856$; see table 1), whereas Tel Aviv-Yafo has the least ($N = 32,361$). Among the three smaller cities, the average number of yearly crime incidents on street segments varies from 14,327 in Brooklyn Park to 5,841 in Redlands.

A general crime measure is applied across all cities. This measure includes a variety of incident types: property (e.g., burglary and property destruction), personal (e.g., homicide, assault, and robbery), disorder (e.g., graffiti and abandoned vehicles), drugs, prostitution, and traffic-related crimes (e.g., drunk driving and hit and run). All data were geocoded in ArcGIS. Geocoding rates were very high for seven of the eight cities studied (Ratcliffe, 2004): Cincinnati, Ohio (95 percent); Seattle, Washington (97 percent); New York, New York (96 percent); Sacramento, California (99 percent); Brooklyn Park, Minnesota (97 percent); Redlands, California (97 percent); and Ventura, California (96 percent). Overall, geocoding rates were much lower for Tel Aviv-Yafo, averaging approximately 77 percent.⁴ Nonetheless, the long series of data available in Tel Aviv-Yafo and the fact that it is a city outside the United States adds an interesting contrast to our review.

UNIT OF ANALYSIS

The geographic unit of study for these analyses of crime concentration is the street segment, including both block faces between two intersections. The choice of street segments as a microgeographic unit of analysis reflects both theoretical and practical concerns. Scholars have long recognized the relevance of the street segment in organizing life in the city (Appleyard, 1981; Jacobs, 1961; Smith, Frazee, and Davison, 2000; Taylor, 1997; Weisburd and Amram, 2014; Weisburd et al., 2004, 2012). Taylor (1997), for example, argued that the visual closeness of block residents, interrelated role obligations, acceptance of certain common norms and behavior, common regularly recurring rhythms of activity, the physical boundaries of the street, and the historical evolution of the street segment make the street block or street segment a particularly useful unit of analysis of place (see also Hunter and Baumer, 1982; Taylor, Gottfredson, and Bower, 1984; Weisburd et al., 2004). Weisburd et al. (2012) and Weisburd, Groff, and Yang (2014) argued that the street segment is a type of microcommunity, forming a first layer in the complex arrangements of community life at varying levels of community in a city (Sampson, 2012: 54–55). In this sense, the street segment is an important theoretical unit for studying crime at place (Weisburd et al., 2012).

The choice of street segments over smaller units, such as addresses, also minimizes the error likely to develop from miscoding of addresses in official data (see Klinger and Bridges, 1997; Weisburd and Green, 1994; Weisburd et al., 2004, 2012). It is one thing to get the specific address of a crime wrong, but it is another to miscode the fact that a crime occurred on a street between two intersections. I exclude those incidents that occurred at an intersection or could not be linked to a specific street segment (see also Curman, Andresen, and Brantingham, 2014; Dario et al., 2015; Weisburd et al., 2004; Weisburd,

4. The geocoding rate generally improves across time, with a rate of 73 percent in 1990 and 84 percent in 2010.

Groff, and Yang, 2014). Intersections cannot be uniquely assigned to any specific street segment because they are generally part of multiple distinct street segments. The proportion of crime at intersections varies across the cities. In Tel Aviv-Yafo, there are no crime incidents tied to intersections (all are linked to street segments), and in Cincinnati, only 7 percent of crime is tied to intersections. In New York City, approximately 20 percent of crime is tied to intersections. Among the smaller cities, 6 percent of crimes are tied to intersections in Brooklyn Park, 11 percent in Ventura, and 33 percent in Redlands. The variability we observe in the data may relate in part to the policies for coding data in a city, as well as to the physical layout of the cities examined. Nonetheless, Weisburd et al. (2004) suggested that the nature of crimes at intersections varies in important ways from those found on street segments. For example, traffic-related crime incidents accounted for only 4.5 percent of reports at street segments in Seattle, but they account for 44 percent of reports at intersections.

LAW OF CRIME CONCENTRATION ACROSS CITIES

Looking at the larger cities, it is clear that crime concentration occurs within a very tight bandwidth despite the variability in characteristics of the cities studied (figure 3). Fifty percent of crime at street segments is found to concentrate in just 4.2 percent (Sacramento) to 6 percent (Cincinnati) of the streets. Twenty-five percent of the crime is found at between .8 percent and 1.6 percent of the street segments. Accordingly, a law of crime concentration operating in these cities seems to follow a very consistent pattern.

Smaller cities follow a similar pattern with even higher levels of crime concentration (figure 4). Between 2.1 percent (Brooklyn Park; Redlands) and 3.5 percent (Ventura) of street segments produce 50 percent of crime at street segments. The percentage of street segments responsible for 25 percent of crime is just .4 percent in Brooklyn Park and Redlands and .7 percent in Ventura. Although caution is warranted in trying to explain small absolute differences between the larger urban areas and more suburban cities examined, these data suggest that the law of crime concentration may operate differently in small suburban cities than in large metropolises. The research I am conducting in Brooklyn Park suggests that such cities may include just a few specific high-density streets, for example, those with public housing developments, that account for very large proportions of crime. Crime concentration in smaller cities is just beginning to be studied (e.g., Dario et al., 2015; Hibdon, 2013), which should shed more light on this question in the future.

But whatever the variability we observe across smaller and larger cities, the overall conclusion we can reach is that there is a tight bandwidth of crime concentration at places suggesting a law of crime concentration across cities. For 50 percent concentration, that bandwidth is about 4 percent (from 2.1 to 6 percent), and for 25 percent concentration, that bandwidth is less than 1.5 percent (from .4 to 1.6 percent). This finding has strong implications for public policies for crime control that have already been applied widely (Braga and Weisburd, 2010; Lum, Koper, and Telep, 2011; Weisburd and Telep, 2010, 2014a, 2014b). If crime is so concentrated at specific places in the city, then policing and other crime prevention resources also should be concentrated. Weisburd, Groff, and Yang (2014) suggested that this should apply not just to criminal justice interventions but also to social interventions that might ameliorate crime problems.

Figure 3. The Law of Crime Concentration in Large Cities

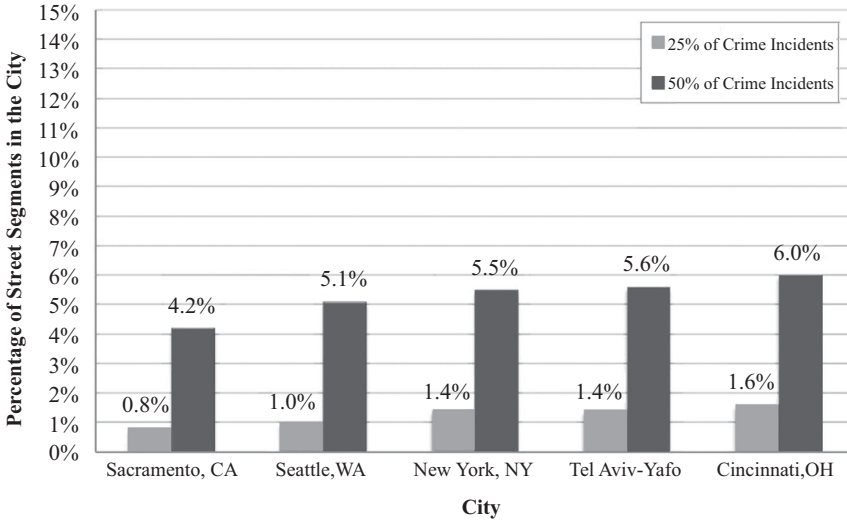
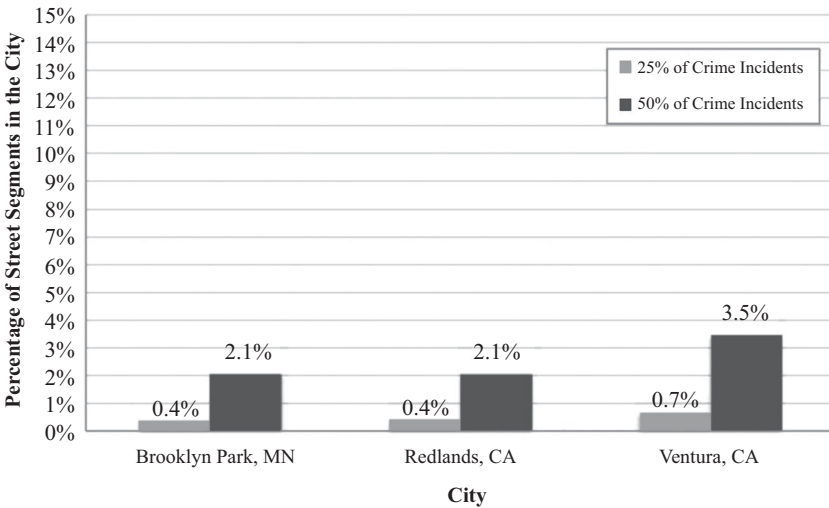


Figure 4. The Law of Crime Concentration in Small Cities



DOES THE LAW OF CRIME CONCENTRATION APPLY ACROSS TIME?

We have seen that on average there is a tight bandwidth of crime concentration across cities. But does that consistency also apply across time? Does that consistency hold even if there are strong trends or fluctuations in crime across time? For four cities studied (Tel Aviv-Yafo, Seattle, Brooklyn Park, and New York), longitudinal data were available that allowed examination of these questions. In figure 5, the crime concentration trends

at 25 and 50 percent of crime are presented, as well as trends in crime incidents across the time period examined for each of the four cities.⁵

As in our examination of crime concentration across cities, we find a relatively small bandwidth of crime concentration within cities across time. In Seattle for 16 years, the bandwidth for a cumulative proportion of 50 percent of crime varied between 4.6 and 5.8 percent, and that for 25 percent of crime between .9 and 1.2 percent of street segments. Similarly in New York, the bandwidth varies between 4.7 and 6 percent for 50 percent of crime and 1.1 and 1.5 percent for 25 percent of crime across a 9-year period. In Brooklyn Park, the concentration is greater, as noted earlier, but the bandwidth is again small varying between 1.5 and 2.6 percent for 50 percent of crime and .3 and .5 percent for 25 percent of crime across a 14-year period. Tel Aviv-Yafo follows the general pattern of stability, but the variation across time is somewhat greater. The bandwidth for the 50 percent cumulative proportion of crime varies between 3.9 (1990) and 6.5 percent (2003), and the 25 percent cumulative proportion between .8 and 1.8 percent.

The number of crime incidents each year appears much more volatile both within and between cities (figure 5). For example, in Tel Aviv-Yafo, there was a large crime wave between 1991 and 1998 (in contrast to American cities during this period; see Blumstein and Wallman, 2000), and a smaller but still meaningful crime drop between 2004 and 2010. In contrast, Brooklyn Park saw a crime drop between 2001 and 2004 of more than 2,500 incidents, then a crime wave increase of more than 3,000 crime incidents, and finally a larger crime drop between 2007 and 2013 of almost 5,000 crime incidents. Seattle shows a fairly consistent overall crime drop of 28,545 incidents between 1989 and 2004. Finally, New York evidences a mixed trend between 2004 and 2006 and then a decline of almost 70,000 crimes between 2006 and 2012. Clearly, the crime patterns differ considerably between the cities. Also, a significant degree of fluctuation of crime incidents occurs across time within cities.

Some caution should be observed in comparing trends between crime incidents across time and crime concentration levels across time. Changes in the concentration lines will be less noticeable because of the relatively condensed scales used. A change from 1 to 1.5 percent for the 25 percent concentration line is a 50 percent relative increase, but it reflects a very small absolute difference in the level of crime concentration at places. A 50 percent decline in crime in any of these cities would be a startling decrease and a very large absolute difference.

But irrespective of the question of scale, it is clear from these data that crime concentration stays within a relatively tight bandwidth across time within the cities studied. This finding strengthens the evidence for a law of crime concentration at place as a specific scientific principle. It also speaks to another general law in criminology proposed by Émile Durkheim more than 100 years ago. Durkheim suggested that crime was not indicative of pathology or illness in society, but at certain levels, it was simply evidence of the normal functioning of communities (Durkheim, 1964 [1895]). For Durkheim, the idea of a normal level of crime reinforced his theoretical position that crime helped to define and solidify norms in society.

5. Crime trends are based only on geocoded data from the three American cities because the geocoding rates are very high and this allows for isolating crime at street segments. In Tel Aviv-Yafo, estimates are based on all crime data available both because all data are attributed to street segments in Tel Aviv-Yafo and, as noted earlier, geocoding rates average only 77 percent.

Crime rates over the last few decades would seem to contradict strongly Durkheim's conception of normal levels of crime in society. Between 1973 and 1990, violent crime doubled in the United States (Reiss and Roth, 1993), and in the 1990s, the United States experienced a well-documented crime drop (Blumstein and Wallman, 2000). In the 1970s, Alfred Blumstein and colleagues (Blumstein and Cohen, 1973; Blumstein, Cohen, and Nagin, 1976; Blumstein and Moitra, 1979) hypothesized that Durkheim's proposition could be applied to punishment in America, where imprisonment rates had remained static for a long period of time (see also Tremblay, 1986). But dramatic increases in U.S. incarcerations in the 1980s and 1990s would seem inconsistent with the normal crime or normal punishment hypothesis unless, of course, we were to postulate that these are periods of dramatic social change where the normal crime hypothesis would not apply (Durkheim, 1964 [1895]). Our cities as well suggest that levels of crime vary widely across time.

But despite the fluctuations in crime across time in the cities we observe, crime concentration stays within a relatively narrow range. In this sense, Durkheim's proposition of a normal level of crime in society can be reinterpreted. There does not seem to be a normal level of crime in urban areas. But there does seem to be a normal level of concentration of crime at place (see also Weisburd and Amram, 2014; Weisburd et al., 2012).

KEY UNANSWERED QUESTIONS

An examination of crime concentration across cities and across time adds important data to the study of the criminology of place. But these findings suggest as well that several key questions are important for criminologists to address. These analyses illustrate a startling phenomenon, which I described as a first law of the criminology of place. The extent of crime concentration at place can be compared with another key scientific principle that led to an important turning point in criminology (Laub, 2004: 12–13): that a small group of offenders produce a large proportion of the crime. In the early 1970s, Marvin Wolfgang, Robert M. Figlio, and Thorsten Sellin (1972) reported on their findings from a cohort of almost 10,000 boys from Philadelphia selected in the 1940s and followed through 1963. They found chronic offenders made up just 6 percent of their sample and yet were responsible for 51.9 percent of offenses committed by the cohort. This finding has spurred generations of studies to try to understand why crime concentrates among a small group of offenders.

To date, we have only a handful of studies that examine why crime concentrates at a small number of chronic crime places or crime hot spots (see Eck, Clarke, and Guerette, 2007; Smith, Frazee, and Davison, 2000; Weisburd et al., 2012; Wikstrom et al., 2012). Although these studies have yielded insights into the factors that lead to places becoming hot spots as opposed to cool spots of crime, our knowledge is very limited. Perhaps thousands of articles have been written using different approaches and based on multiple methods, including several well-designed prospective longitudinal studies of human development (e.g., Elliott and Huizinga, 1983; Loeber et al., 1998; Mulvey, 2011; Ttofi et al., 2011; Warr, 1998; West and Farrington, 1973) attempting to draw insights into the underlying causes of criminality. My colleagues and I have just begun a long-term prospective longitudinal study of crime hot spots (Weisburd, Lawton, and Ready, 2012; Weisburd et al., 2012). But this study is the only one I am aware of taking this approach,

suggesting that there is much to be done and many opportunities to contribute to knowledge in this area.

It is not enough to have data about crime and place; there is need for rigorous theory development if we are to know what data to collect and which models to test. Theoretical development in study of crime and place is still in early stages of development. The main focus so far has been in the application of opportunity theories of crime (see Cullen, 2010; Weisburd et al., 2012; Wilcox, Land, and Hunt, 2003). Routine activities theory (Cohen and Felson, 1979), situational prevention (Clarke, 1995), and crime pattern theory (Brantingham and Brantingham, 1993) all place great emphasis on the specific opportunities offered by places and situations. Recently, my colleagues and I (Weisburd et al., 2012; Weisburd, Groff, and Yang, 2014) have suggested that theory about microgeographic places should draw as well from community-based theories of crime that have emphasized social factors and the importance of social disorganization (see Sampson and Groves, 1989; Shaw and McKay, 1942). But only a handful of studies focus on theories of crime at place (e.g., Brantingham and Brantingham, 1999; Eck and Eck, 2012; Eck and Weisburd, 1995).

Would the law of crime concentration apply within the narrow bandwidth we observe if we were able to sample large numbers of cities using the same data and measurement metrics? Are there circumstances in which the law of crime concentration across cities does not apply? The data presented here are based on a convenience sample. Although I argued earlier that the cities examined vary a good deal in their characteristics, it is time to examine a wide array of cities that are drawn using established sampling techniques from which we can draw strong generalizations to larger populations. Such an approach would allow us not only to develop further the generalizability of the law of crime concentration but also to identify whether there are specific contexts in which the law does not apply or applies at much different levels. It may be following Durkheim (1964 [1895]), for example, that the law of crime concentration would not apply in times of social upheaval. Perhaps the levels of concentrations we observe apply in a broad way to societies that are overall healthy in their social conditions.

Also, it is important to explore the relationship between the law of crime concentration and concentrations of phenomena observed in other fields, such as the 80/20 rule in economics (Juran, 1951; see also Pareto, 1909) or the 90/10 rule in computer science (Lipovetsky, 2009). The concentration of crime follows patterns of concentration in many other areas of scientific inquiry (e.g., Bak, 1994; Eck, Clarke, and Guerette, 2007; Hill, Maucione, and Hood, 2007; Sherman, 2007). The concentration of human activity has been noted for more than 100 years (among others, Allport, 1934; Dalton, 1920; Gini, 1912; Hirschman, 1945; Lorenz, 1905; Zipf, 1949). Does crime concentration reflect concentrated activity in other areas of social life? If so, then it suggests that we need to broaden our lens and recognize that crime is only one of a series of phenomena that are concentrated in the modern city. In turn, we also have to consider the possibility of general statistical laws that apply not only across social life but also across such phenomena as the concentration of computer processing. For example, is there a statistical principle analogous to *regression to the mean* (Bland and Altman, 1994) that predicts levels of concentration regardless of the phenomena observed?

Why do we observe strong stability of crime concentration across time? Is it because social characteristics of urban areas remain relatively stable across the periods of time we observe? Or do we need to adjust our lens for assessing crime changes in understanding patterns of crime at microgeographic units? Several studies have illustrated that

there is strong street-by-street variability in crime within cities and that there are crime hot spots in neighborhoods that are generally termed *good neighborhoods* and that most streets even in so-called *bad neighborhoods* have little or no crime (Curman, Andresen, and Brantingham, 2014; Groff, Weisburd, and Yang, 2010; Weisburd and Amram, 2014; Weisburd et al., 2012; Weisburd, Telep, and Lawton, 2014). Groff, Weisburd, and Yang (2010: 7) noted, for example, in a study of juvenile crime at street segments that “[i]n a surprising number of cases we find that individual street segments have [crime] trajectories which are unrelated to their immediately adjacent streets.” This finding suggests the need to expand our perspective on social change in understanding crime patterns at street segments, and in cities more generally, to examine street characteristics rather than the broad social patterns typically adopted by community theorists. For example, my colleagues and I have found that decreasing property values, increased housing assistance, and declines in collective efficacy at street segments are all related to streets that experience crime waves over a 14-year period in Seattle, Washington (Weisburd et al., 2012). Perhaps stability in crime concentration across time is a result of unusual levels of stability of social conditions at microgeographic crime hot spots rather than of trends across neighborhoods or cities as a whole (see Weisburd et al., 2004).

IT IS TIME FOR ANOTHER TURNING POINT IN THE DEVELOPMENTAL CAREER OF CRIMINOLOGY

Edwin Sutherland argued in his seminal text, *Principles of Criminology* (1947: 23), that “[c]riminology at present is clearly not a science, but it has hopes of becoming a science.” Key to that effort was the development of “general propositions of universal validity.” He noted that criminology had not yet developed such principles. Today, we can recognize a few general propositions that meet this standard. We identified one earlier—that a small number of high-rate offenders produce a large proportion of the crime—first noted by Wolfgang, Figlio, and Sellin (1972) more than 40 years ago. Another is the commonly cited *age-crime curve*, which recognizes that most criminals generally age out of crime (Steffensmeier et al., 1989). But a small number of such universal laws remains, and as criminology develops as a science, it is important to study and explore carefully each one that is identified. The criminology of place, in a very early stage of its development, has already generated such a general proposition: the law of crime concentration at place. This proposition in itself speaks to the importance of greater focus on crime at place in criminology.

But another reason for a turning point in the developmental career of criminology is drawn from the current state of criminological knowledge. Continuing with business as usual will likely not add dramatically to our generation of important insights for theory or policy. This point was made strongly by Frank Cullen in his 2010 Sutherland Address to the American Society of Criminology. He argued there:

For over a half century, criminology has been dominated by a paradigm—adolescence-limited criminology (ALC)—that has privileged the use of self-report surveys of adolescents to test sociological theories of criminal behavior and has embraced the view that “nothing works” to control crime. Although ALC has created knowledge, opposed injustice, and advanced scholars’ careers, it has outlived its utility. The time has come for criminologists to choose a different future. (Cullen, 2011: 287)

Cullen (2011) suggested areas that provided promise for advancing criminology and crime prevention. These areas included life-course criminology (e.g., Laub and Sampson, 2003), biological social theory (Moffitt, 1993), criminal decision making (e.g., Nagin and Pogarsky, 2001), and the study of crime events (e.g., Clarke, 1980). The criminology of place suggests a radical departure from current interests, and that is why I have argued for a turning point in the life course of criminology. Its concern is with the units of analysis of criminological study rather than with the measurement of crime or the theory used to understand crime. In this sense, each innovation that Cullen described can be examined or applied in the context of micro-crime places. In this context, the criminology of place offers a promising new direction for criminology, which has tremendous possibilities for advancing criminology as a science.

Earlier in the article, I provided evidence suggesting that the criminology of place has received little attention in criminology. This fact presents a particular opportunity for young scholars looking to advance criminology and their careers. In contrast to the traditional concerns that Cullen (2011) critiques, which have been the focus of thousands of papers and studies, crime and place has occupied a marginal location in empirical research in criminology. There is much room to make new discoveries and to examine new problems. It is a field where we know little and the landscape of knowledge is wide open to young scholars for exploration. I laid out some key research questions that need to be answered. But these are simply a drop in the bucket relative to the vast array of questions that need to be examined to advance this area of inquiry.

These questions are not only about understanding crime, but also they are about doing something about crime. One of Cullen's (2011) main objections to continuity in the life course of criminology is that it has little promise for helping us to do something about crime problems. He argued that "[w]e have contributed valuable work to knowledge destruction—showing what does not work—but have not done much to show what does work through knowledge construction" (Cullen, 2011: 318). In contrast, the criminology of place from the start has focused on what we can do about the crime problem. In the late 1980s, when descriptive empirical findings were just beginning to emerge, Lawrence Sherman (1995) and I designed the Minneapolis Hot Spots Patrol Experiment to counter widely stated claims that the police "could not do anything about crime" (Bayley, 1994; Gottfredson and Hirschi, 1990). Since the results of that study were published, more than 20 field trials of hot spots policing have taken place, nearly all of them showing crime prevention benefits for the interventions examined (Braga, Papachristos, and Hureau, 2014). Studies also have documented that such programs are more likely to lead to a diffusion of crime control benefits (Clarke and Weisburd, 1994) to nearby areas than to displacement of crime (Braga, Papachristos, and Hureau, 2014; Guerette and Bowers, 2009; Weisburd et al., 2006). Accordingly, study of the criminology of place not only offers tremendous opportunities to advance criminology as a science but also has already yielded strong evidence of practical and successful crime prevention applications.

CONCLUSIONS

It is time for another turning point in the life course of criminology. Study of the criminology of place represents a distinct departure from the predominant perspectives in criminology. But it offers a focus of empirical investigation that has tremendous potential to advance criminology as a discipline and to make criminology relevant as a policy

science. I have focused on a first law of the criminology of place—the *law of crime concentration at places*. I have presented new evidence showing that the law applies with startling consistency both across cities and within cities across time. The data suggest that the law of crime concentration is a “general proposition of universal validity” (Sutherland, 1947: 23), analogous to physical laws observed in the natural sciences. It is time for criminologists to focus their attention on place. This emphasis will enrich criminology and crime prevention.

REFERENCES

- Allport, Floyd H. 1934. The J-curve hypothesis of conforming behavior. *Journal of Social Psychology* 5:141–83.
- Andresen, Martin A., and Nicolas Malleon. 2011. Testing the stability of crime patterns: Implications for theory and policy. *Journal of Research in Crime and Delinquency* 48:58–82.
- Appleyard, Donald. 1981. *Livable Streets*. Berkeley: University of California Press.
- Bak, Per. 1994. Self-organized critically: A holistic view of nature. In *Complexity: Metaphors, Models, and Reality*, eds. George Cowan, David Pines, and David E. Meltzer. Reading, MA: Addison-Wesley.
- Bayley, David. 1994. *Police for the Future*. New York: Oxford University Press.
- Bland, J. Martin, and Douglas G. Altman. 1994. Regression towards the mean. *BMJ: British Medical Journal* 308:1499.
- Blumstein, Alfred, and Jacqueline Cohen. 1973. A theory of the stability of punishment. *The Journal of Criminal Law and Criminology* 64:198–207.
- Blumstein, Alfred, Jacqueline Cohen, and Daniel S. Nagin. 1976. The dynamics of a homeostatic punishment process. *The Journal of Criminal Law and Criminology* 67:317–34.
- Blumstein, Alfred, and Soumyo Moitra. 1979. An analysis of the time series of the imprisonment rate in the states of the United States: A further test of the stability of punishment hypothesis. *The Journal of Criminal Law and Criminology* 70:376–90.
- Blumstein, Alfred, and Joel Wallman. 2000. The recent rise and fall of American violence. In *The Crime Drop in America*, eds. Alfred Blumstein and Joel Wallman. Cambridge, U.K.: Cambridge University Press.
- Braga, Anthony, David M. Hureau, and Andrew V. Papachristos. 2010. The concentration and stability of gun violence at micro places in Boston, 1980–2008. *Journal of Quantitative Criminology* 26:33–53.
- Braga, Anthony, David M. Hureau, and Andrew V. Papachristos. 2011. The relevance of micro places to citywide robbery trends: A longitudinal analysis of robbery incidents at street corners and block faces in Boston. *Journal of Research in Crime and Delinquency* 48:7–32.
- Braga, Anthony A., Andrew V. Papachristos, and David M. Hureau. 2014. The effects of hot spots policing on crime: An updated systematic review and meta-analysis. *Justice Quarterly* 31:633–63.
- Braga, Anthony, and David Weisburd. 2010. *Policing Problem Places: Crime Hot Spots and Effective Prevention*. Oxford, U.K.: Oxford University Press.
- Brantingham, Patricia L., and Paul J. Brantingham. 1993. Environment, routine, and situation: Toward a pattern theory of crime. In *Routine Activity and Rational Choice*.

- Crime Prevention Studies*, eds. Ronald V. Clarke and Marcus Felson. New Brunswick, NJ: Transaction.
- Brantingham, Patricia L., and Paul J. Brantingham. 1999. Theoretical model of crime hot spot generation. *Studies Crime and Crime Prevention* 8:7–26.
- Choshen, Maya, and Michal Korach. 2010. *Jerusalem: Facts and Trends 2009/2010*. Jerusalem: Jerusalem Institute for Israel Studies.
- Clarke, Ronald V. 1980. Situational crime prevention: Theory and practice. *British Journal Criminology* 20:136–47.
- Clarke, Ronald V. 1995. Situational crime prevention. In *Building a Safer Society: Strategic Approaches to Crime Prevention. Crime and Justice: A Review of Research*, eds. Michael Tonry and David P. Farrington. Chicago, IL: University of Chicago Press.
- Clarke, Ronald V., and David Weisburd. 1994. Diffusion of crime control benefits: Observations on the reverse of displacement. *Crime Prevention Studies* 2:165–84.
- Cohen, Lawrence E., and Marcus Felson. 1979. Social change and crime rate trends: A routine activity approach. *American Sociological Review* 44:588–608.
- Crow, Wayman, and James Bull. 1975. *Robbery Deterrence: An Applied Behavioral Science Demonstration: Final Report*. La Jolla, CA: Western Behavioral Science Institute.
- Cullen, Francis T. 2010. Cloward, Richard A.: The theory of illegitimate means. In *Encyclopedia of Criminological Theory*, eds. Francis T. Cullen and Pamela Wilcox. Thousand Oaks, CA: Sage.
- Cullen, Francis T. 2011. Beyond adolescence-limited criminology: Choosing our future—The American Society of Criminology 2010 Sutherland Address. *Criminology* 49:287.
- Curman, Andrea S., Martin A. Andresen, and Paul J. Brantingham. 2014. Crime and place: A longitudinal examination of street segment patterns in Vancouver, BC. *Journal of Quantitative Criminology*. E-pub ahead of print.
- Dalton, Hugh. 1920. The measurement of the inequality of incomes. *Economic Journal* 30:348–61.
- Dario, Lisa M., Weston J. Morrow, Alese Wooditch, and Samuel G. Vickovic. 2015. Transitory opportunity structures: An examination of surf and crime. *Criminal Justice Studies*, doi:10.1080/1478601X.2015.1032409.
- Durkheim, Émile. 1964 [1895]. *The Rules of Sociological Method* (George E. G. Catlin, ed. and Sarah A. Solovay and John H. Mueller, trans.). New York: Free Press.
- Eck, John E., Ronald V. Clarke, and Rob T. Guerette. 2007. Risky facilities: Crime concentration in homogeneous sets of establishments and facilities. *Crime Prevention Studies* 21:225.
- Eck, John E., and Emily B. Eck. 2012. Crime place and pollution: Expanding crime reduction options through a regulatory approach. *Criminology & Public Policy* 11:281–316.
- Eck, John E., Jeffrey Gersh, and Charlene Taylor. 2000. Finding crime hot spots through repeat address mapping. In *Analyzing Crime Patterns: Frontiers of Practice*, eds. Victor Goldsmith, Philip McGuire, John Mollenkopf, and Timothy Ross. Thousand Oaks, CA: Sage.
- Eck, John E., and David Weisburd. 1995. Crime places in crime theory. In *Crime Prevention Studies*, eds. John E. Eck and David Weisburd. Monsey, NY: Criminal Justice Press.
- Elliott, Delbert S., and David Huizinga. 1983. Social class and delinquent behavior in a national youth panel: 1976–1980. *Criminology* 21:149–77.

- Evans, David J., and David T. Herbert. 1989. *The Geography of Crime*. London, U.K.: Routledge.
- Felson, Marcus. 1987. Routine activities and crime prevention in the developing metropolis. *Criminology* 25:911.
- Gini, Corrado. 1912. Variabilità e mutabilità, Studi economico-giuridici della R. *Università di Cagliari* 3:3–159.
- Gottfredson, Michael R., and Travis Hirschi. 1990. *A General Theory of Crime*. Stanford, CA: Stanford University Press.
- Groff, Groff, Elizabeth, David Weisburd, and Sue-Ming Yang. 2010. Is it important to examine crime trends at a local “micro” level: A longitudinal analysis of street to street variability in crime trajectories. *Journal of Quantitative Criminology* 26:7–32.
- Guerette, Rob T., and Kate J. Bowers. 2009. Assessing the extent of crime displacement and diffusion of benefits: A review of situational crime prevention evaluations. *Criminology* 47:1331–68.
- Hibdon, Julie. 2013. *Crime Hot Spots in Suburbia: A Case Study*. Paper presented at the American Society of Criminology.
- Hill, Laura G., Katherine Maucione, and Brianne K. Hood. 2007. A focused approach to assessing program fidelity. *Prevention Science* 8:25–34.
- Hirschman, Albert O. 1945. *National Power and the Structure of Foreign Trade*. Berkeley: University of California Press.
- Hunter, Albert, and Terry L. Baumer. 1982. Street traffic, social integration, and fear of crime. *Sociological Inquiry* 52:122–31.
- Jacobs, Jane. 1961. *The Death and Life of Great American Cities*. New York: Vintage Books.
- Juran, Joseph M. 1951. *Quality Control Handbook*. New York: McGraw-Hill.
- Klinger, David A., and George S. Bridges. 1997. Measurement error in calls-for-service as an indicator of crime. *Criminology* 35:705–26.
- Laub, John H. 2004. Life course of criminology in the United States: The American Society of Criminology 2003 Presidential Address. *Criminology* 42:1.
- Laub, John H., and Robert Sampson. 2003. *Shared Beginnings, Divergent Lives: Delinquent Boys to Age 70*. Cambridge, MA: Harvard University Press.
- Lee, YongJei, John E. Eck, Robin Engel, Murat Ozer, and Rustu Deryol. 2014. Disaggregating hot street segments with alternative measures of concentration. Paper presented at the 70th Conference of the American Society of Criminology (ASC), San Francisco, CA.
- Lipovetsky, Stan. 2009. Pareto 80/20 law: Derivation via random partitioning. *International Journal of Mathematical Education in Science and Technology* 40:271–77.
- Loeber, Rolf, David P. Farrington, Magda Stouthamer-Loeber, Terrie E. Moffitt, and Avshalom Caspi. 1998. The development of male offending: Key findings from the first decade of the Pittsburgh Youth Study. *Studies on Crime & Crime Prevention* 7:141–71.
- Lorenz, M. O. 1905. Methods of measuring the concentration of wealth. *Publications of the American Statistical Association* 9:209–19.
- Lum, Cynthia, Chris S. Koper, and Cody W. Telep. 2011. The evidence-based policing matrix. *Journal of Experimental Criminology* 7:3–26.

- Minnesota Department of Public Safety. 2012. *Uniform Crime Report*. Saint Paul, MN: Bureau of Criminal Apprehension. <https://dps.mn.gov/divisions/bca/bca-divisions/mnjis/Documents/2012%20Crime%20Book.pdf>.
- Moffitt, Terrie E. 1993. Adolescence-limited and life-course-persistent antisocial behavior: A developmental taxonomy. *Psychological Review* 100:674–701.
- Mulvey, Edward P. 2011. *Highlights from Pathways to Desistance: A Longitudinal Study of Serious Adolescent Offenders*. Washington, DC: Office of Juvenile Justice and Delinquency Prevention, U.S. Department of Justice.
- Nagin, Daniel S., and Greg Pogarsky. 2001. Integrating celerity, impulsivity, and extralegal sanction threats into a model of general deterrence: Theory and evidence. *Criminology* 39:865–92.
- Pareto, Vilfredo. 1909. *Manuel D'Économie Politique. Vol. 7 of Oeuvres complètes*. Geneva, Switzerland: Droz.
- Physical law (def. 1). 2010. In *Oxford English Dictionary*, 3rd ed. Oxford, U.K.: Oxford University Press.
- Pierce, Glenn L., Susan Spaar, and LeBaron R. Briggs. 1988. *The Character of Police Work: Strategic and Tactical Implications*. Boston, MA: Center for Applied Social Research, Northeastern University.
- Ratcliffe, Jerry H. 2004. Geocoding crime and a first estimate of a minimum acceptable hit rate. *International Journal of Geographical Information Science* 18:61–72.
- Reiss, Albert J., Jr., and Jeffrey A. Roth. 1993. *Understanding and Preventing Violence*. Panel on the Understanding and Control of Violent Behavior, Committee on Law and Justice, Commission on Behavioral and Social Sciences and Education, National Research Council. Washington, DC: National Academy Press.
- Roncek, Dennis. 2000. Schools and crime. In *Analyzing Crime Patterns Frontiers of Practice*, eds. Victor Goldsmith, Philip McGuire, John Mollenkopf, and Timothy Ross. Thousand Oaks, CA: Sage.
- Sampson, Robert J. 2012. *Great American City: Chicago and the Enduring Neighborhood Effect*. Chicago, IL: University of Chicago Press.
- Sampson, Robert J., and W. Bryon Groves. 1989. Community structure and crime: Testing social disorganization theory. *American Journal of Sociology* 94:774–802.
- Shaw, Clifford R., and Henry D. McKay. 1942. *Juvenile Delinquency and Urban Areas*. Chicago, IL: University of Chicago Press.
- Sherman, Lawrence W. 1987. *Repeat Calls to Police In Minneapolis. Crime Control Reports 4*. Washington, DC: Crime Control Institute.
- Sherman, Lawrence W. 1995. Hot spots of crime and criminal careers of places. *Crime and Place* 4: 35–52.
- Sherman, Lawrence W. 2007. The power few: Experimental criminology and the reduction of harm. *Journal of Experimental Criminology* 3:299–321.
- Sherman, Lawrence W., Patrick R. Gartin, and Michael E. Buerger. 1989. Hot spots of predatory crime: Routine activities and the criminology of place. *Criminology* 27:27.
- Sherman, Lawrence W., and David Weisburd. 1995. General deterrent effects of police patrol in crime “hot spots”: A randomized, controlled trial. *Justice Quarterly* 12:625–48.
- Smith, William R., Sharon Glave Frazee, and Elizabeth L. Davison. 2000. Furthering the integration of routine activity and social disorganization theories: Small units of analysis and the study of street robbery as a diffusion process. *Criminology* 38:489–523.

- Spelman, William. 1995. Criminal careers of public places. In *Crime and Place*, eds. John E. Eck and David Weisburd. Monsey, NY: Criminal Justice Press.
- Steffensmeier, Darrell J., Emilie Andersen Allan, Miles D. Harer, and Cathy Streifel. 1989. Age and the distribution of crime. *American Journal of Sociology* 94:803–31.
- Sutherland, Edwin H. 1947. *Principles of Criminology*. Chicago, IL: University of Chicago Press.
- Taylor, Ralph B. 1997. Social order and disorder of street blocks and neighborhoods: Ecology, microecology, and the systemic model of social disorganization. *Journal of Research in Crime and Delinquency* 34:113–55.
- Taylor, Ralph B., Stephen D. Gottfredson, and Sidney Bower. 1984. Block crime and fear: Defensible space, local social ties, and territorial functioning. *Journal of Research in Crime and Delinquency* 21:303–31.
- Tel Aviv Government. 2013. <http://www.tel-aviv.gov.il/TheCity/Documents/והתנש%202013/TheBook/Docs/הנבמ%20החול/יפרגומד%20הקפה%201.pdf>
- Telep, Cody W., Renee J. Mitchell, and David Weisburd. 2014. How much time should the police spend at crime hot spots? Answers from a police agency directed randomized field trial in Sacramento, California. *Justice Quarterly* 31:905–33.
- Townsley, Michael, Ross Homel, and Janet Chaseling. 2003. Infectious burglaries: A test of the near repeat hypothesis. *British Journal of Criminology* 43:615–33.
- Tremblay, Pierre. 1986. The stability of punishment: A follow-up of Blumstein's hypothesis. *Journal of Quantitative Criminology* 2:157–80.
- Ttofi, Maria M., David P. Farrington, Friedrich Lösel, and Rolf Loeber. 2011. The predictive efficiency of school bullying versus later offending: A systematic/meta-analytic review of longitudinal studies. *Criminal Behaviour and Mental Health* 21:80–9.
- U.S. Census Bureau. 2009–2013. State and County QuickFacts. <http://quickfacts.census.gov/qfd/>.
- U.S. Department of Justice. 2012. *Crime in the United States*. Washington, DC: Federal Bureau of Investigation. <http://www.fbi.gov/about-us/cjis/ucr/crime-in-the-u.s/2012/crime-in-the-u.s.-2012>.
- Warr, Mark. 1998. Life-course transitions and desistance from crime. *Criminology* 36:183–216.
- Weisburd, David, and Shai Amram. 2014. The law of concentrations of crime at place: The case of Tel Aviv-Jaffa. *Police Practice & Research* 15:101–14.
- Weisburd, David, Shawn Bushway, Cynthia Lum, and Sue Ming Yang. 2004. Trajectories of crime at place: A longitudinal study of street segments in the city of Seattle. *Criminology* 42:283–322.
- Weisburd, David, Charlotte Gill, and Alese Wooditch. 2014. *Smart Police Initiative Action Plan: Brooklyn Park*. Grant 2013-DB-BX-0030. Washington, DC: Bureau of Justice Assistance.
- Weisburd, David, and Lorraine Green. 1994. Defining the street-level drug market. In *Drugs and Crime: Evaluating Public Policy Initiatives*, eds. Doris Layton MacKenzie and Craig D. Uchida. Thousand Oaks, CA: Sage.
- Weisburd, David, and Lorraine Green. 1995. Policing drug hot spots: The Jersey City drug market analysis experiment. *Justice Quarterly* 4:711–35.
- Weisburd, David, Elizabeth R. Groff, and Sue-Ming Yang. 2012. *The Criminology of Place: Street Segments and Our Understanding of the Crime Problem*. Oxford, U.K.: Oxford University Press.

- Weisburd, David, Elizabeth R. Groff, and Sue-Ming Yang. 2014. Understanding and controlling hot spots of crime: The importance of formal and informal social controls. *Prevention Science* 15:31–43.
- Weisburd, David, Brian Lawton, and Justin Ready. 2012. Staking out the next generation of studies of the criminology of place: Collecting prospective longitudinal data at crime hot spots. In *The Future of Criminology*, eds. Rolf Lober and Brandon Welsh. New York: Oxford University Press.
- Weisburd David, Brian Lawton, Justin Ready, and Amelia Haviland. 2012. *Community Health and Anti-Social Behavior at Drug Hot Spots*. Bethesda, MD: National Institute on Drug Abuse.
- Weisburd, David, Lisa Maher, and Lawrence W. Sherman. 1992. Contrasting crime general and crime specific theory: The case of hot spots of crime. In *Advances in Criminological Theory*, eds. Freda Adler and William S. Laufer. New Brunswick, NJ: Transaction.
- Weisburd, David, and Lorraine Mazerolle. 2000. Crime and disorder in drug hot spots: Implications for theory and practice in policing. *Police Quarterly* 3:331–49.
- Weisburd, David, Nancy A. Morris, and Elizabeth R. Groff. 2009. Hot spots of juvenile crime: A longitudinal study of street segments in Seattle, Washington. *Journal of Quantitative Criminology* 25:443–67.
- Weisburd, David, and Cody W. Telep. 2010. *The Efficiency of Place-Based Policing*. Stockholm, Sweden: The Expert Group for Public Economics. http://eso.expertgrupp.se/wp-content/uploads/2010/07/2010_3-Weisburd-o-Telep.pdf.
- Weisburd, David, and Cody W. Telep. 2014a. Law of crime concentrations at places. In *Encyclopedia of Criminology and Criminal Justice*, eds. David Weisburd and Gerben Buinsma. New York: Springer Verlag.
- Weisburd, David, and Cody W. Telep. 2014b. Hot spots policing: What we know and what we need to know. *Journal of Contemporary Criminal Justice* 30:200–20.
- Weisburd, David, Cody W. Telep, and Brian Lawton. 2014. Could innovations in policing have contributed to the New York City crime drop even in a period of declining police strength? The case of stop, question and frisk as a hot spots policing strategy. *Justice Quarterly* 31:129–53.
- Weisburd, David, Laura A. Wyckoff, Justin Ready, John E. Eck, Joshua C. Hinkle, and Frank Gajewski. 2006. Does crime just move around the corner? A controlled study of spatial displacement and diffusion of crime control benefits. *Criminology* 44:549–92.
- West, Donald James, and David P. Farrington. 1973. *Who Becomes Delinquent? Second Report of the Cambridge Study in Delinquent Development*. Oxford, U.K.: Crane, Rusak.
- Wikström, Per-Olof, Dietrich Oberwittler, Kyle Treiber, and Beth Hardie. 2012. *Breaking Rules: The Social and Situational Dynamics of Young People's Urban Crime*. Oxford, U.K.: Oxford University Press.
- Wilcox, Pamela, and John Eck. 2011. Criminology of the unpopular. *Criminology & Public Policy* 10:473–82.
- Wilcox, Pamela, Kenneth C. Land, and Scott C. Hunt. 2003. *Criminal Circumstance: A Dynamic Multicontextual Criminal Opportunity Theory*. New York: Walter de Gruyter.
- Wolfgang, Marvin E., Robert M. Figlio, and Thorsten Sellin. 1972. *Delinquency in a Birth Cohort*. Chicago, IL: University of Chicago Press.

Zipf, George Kingsley. 1949. *Human Behavior and the Principle of Least Effort*. Oxford, U.K.: Addison-Wesley.

David Weisburd is the Distinguished Professor of Criminology, Law and Society at George Mason University and the Walter E. Meyer Professor of Law and Criminal Justice at The Hebrew University. His current research interests are focused on the criminology of place, policing, and research methods.