The Law of Crime Concentration and Crime and Justice Practice

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Study of crime at micro-geographic 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 (1989) 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 and crime prevention practitioners with why specific types of people commit crime.

In my Sutherland Address to the American Society of Criminology in 2014 (Weisburd, 2015) I presented what I 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. In this essay I want to focus on the important implications of the law of crime concentration for crime and justice practice.

The 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 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). A number of studies beginning in the late 1980s find that there is significant clustering of crime at micro-geographic 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 In Press; Pierce et al., 1988; Roncek, 2000; Sherman et al., 1989; Weisburd and Amram, 2014; Weisburd, Bushway, Lum, and Yang, 2004; Weisburd and Green, 1994; Weisburd, Morris, and Groff, 2009; Weisburd et al., 1992, 2012).

These studies establish clearly that crime is concentrated at micro-geographic 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 (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 presented data in my Sutherland address that suggest that there is a *law of crime concentration.* This law states *that for a defined measure of crime at a specific micro-geographic unit, the concentration of crime will fall within a narrow bandwidth of percentages for a defined cumulative proportion of crime*.[[1]](#footnote-1)

The Law of Crime Concentration Across Cities

Looking at five larger larger cities, it is clear that crime concentration occurs within a very tight bandwidth despite the variability in characteristics of the cities studied (see Weisburd, 2015). Fifty percent of crime at street segments is found to concentrate in just 4.2 (Sacramento) to 6 (Cincinnati) percent of the streets. Twenty-five percent of the crime is found at between 0.8 and 1.6 percent of the street segments. Accordingly, there appears to be a law of crime concentration operating in these cities that follows a very consistent pattern.

Figure 3 about here

Three smaller cities I examined followed a similar pattern with even higher levels of crime concentration (see Figure 4). Between 2.1 percent (Brooklyn Park; Redlands) and 3.5 (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 0.4 percent in Brooklyn Park and Redlands and 0.7 percent in Ventura. These data suggest that the law of crime concentration may operate differently in small suburban cities than in large metropolises.

See Figure 4

But whatever the variability we observe across smaller and larger cities, the overall conclusion I reach is that there is a tight band width 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 the bandwidth is less than 1.5 percent (from 0.4 to 1.6 percent). This 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).

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 over time? For four of the 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 over the time period examined for each of the four cities.[[2]](#footnote-2)

As in our examination of crime concentration across cities, we find a relatively small bandwidth of crime concentration within cities across time. In Seattle over 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 0.9 and 1.2 percent of street segments. Similarly in New York, the band width varies between 4.7 and 6 percent for 50 percent of crime and 1.1 and 1.5 percent for 25 percent of crime over a 9 year period. In Brooklyn Park, the concentration is greater, as we noted earlier, but the bandwidth is again small varying between 1.5 and 2.6 percent for 50 percent of crime and 0.3 and 0.5 percent for 25 percent of crime over 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 0.8 and 1.8 percent.

Figure 5 about here

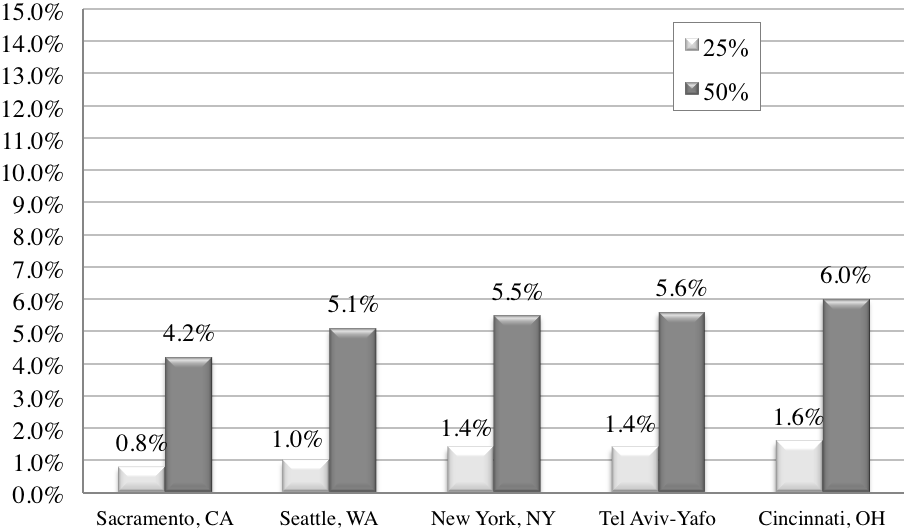
The number of crime incidents each year appears much more volatile both within and between cities (see Figure 5). For example, in Tel Aviv-Yafo, there was a large crime wave between 1991 and 1998 (in contrast to American cities during this period, see Blumstein and Wallman, 2000), and a smaller but still 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 over 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. There is also a very significant degree of fluctuation of crime incidents across time within cities.

It is clear from these data that crime concentration stays within a relatively tight bandwidth across time within the cities studied. This strengthens the evidence for a law of crime concentration at place as a specific scientific principle

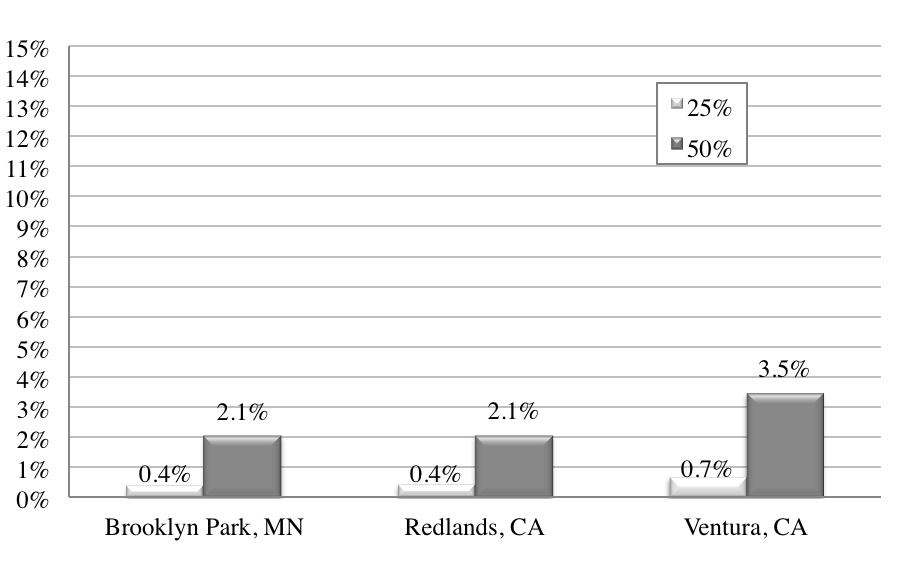
Key Unanswered Questions

**Figure 1. Units of analysis in empirical articles in *Criminology* 1990-2014 (N = 719)[[3]](#footnote-3)**

**Figure 2. Changes in Rates of Micro-place Studies over Time**

**Figure 3. The Law of Crime Concentration in Large Cities** **+**

**Figure 4. The Law of Crime Concentration in Small Cities**

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**Figure 5. Trends in Crime Concentration and Number of Crime Incidents over Time**

*Tel Aviv-Yafo Seattle, WA*

20.0%

15.0%

10.0%

5.0%

0.0%

40000

30000

20000

10000

0

0

*Brooklyn Park, MN New York, NY*

20.0%

15.0%

10.0%

5.0%

0.0%

20.0%

15.0%

10.0%

5.0%

0.0%

450000

400000

350000

300000

250000

**Table 1. Description of Crime Concentration Data**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Large Cities** | | | | |  | **Small Cities** | | |
|  | *Cincinnati, OH* | *Seattle,*  *WA* | *Tel Aviv* | *New York,*  *NY* | *Sacramento, CA* |  | *Brooklyn Park, MN* | *Redlands, CA* | *Ventura,*  *CA* |
| Investigators | Lee, Eck, Engel, Ozer, Deryol | Weisburd, Groff, Yang | Weisburd, Amram | Weisburd, Wooditch, Weisburd, Yang | Telep, Mitchell, Weisburd |  | Weisburd, Gill, Wooditch | Taniguchi | Dario, Morrow, Wooditch, 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 |
| % of Crime at Intersections | 6.9% | 15.7% | 0% | 20.2% | 16.9% |  | 5.9% | 33.2% | 11.0% |

**Table 2. Characteristics of Cities included in the Analysis****7**

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | **Large Cities** | | | | |  |  | **Small Cities** | | |
|  | *Cincinnati, OH* | *Seattle,*  *WA* | *Tel Aviv-Yaso* | *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 | 3.618 | 6.4 | 7.4 |  |  | 3.4 | 3.1 | 2.9 |
| Percent African-American | 44.8% | 7.9% | 4.2%9 | 25.5% | 14.6% |  |  | 24.4% | 5.2% | 2.2% |
| Percent Below Poverty Level | 30.4% | 13.6% | 14.0% | 20.3% | 21.9% |  |  | 12.3% | 12.5% | 11.1% |

7 Population estimates and the number of yearly violent crimes was obtained from *Crime in the United States* (2012) from the U.S. Department of Justice, Federal Bureau of Investigation's Uniform Crime Reporting (UCR) Program for year 2012. Violent crime data includes four offense types: murder, forcible rape, robbery, and aggravated assault. Due to noncompliance with data collection methodology of Minnesota, forcible rape totals are not provide by the UCR and therefore were collected from the State of Minnesota's UCR (2012). Data on percent African-American and below poverty level were obtained from the U.S. Census Bureau for years 2009 – 2013. Poverty rates for Tel Aviv-Yafo were obtained from *Jerusalem: Facts and Trends* (2010)for year 2008. Other data for Tel Aviv-Yafo obtained was obtained from the government of Tel Aviv’s website: <http://www.tel-aviv.gov.il/TheCity/Documents/שנתון%202013/TheBook/Docs/מבנה%20דמוגרפי/לוחות%20הפרק%201.pdf>

8 The violent crime rate for Tel Aviv comes from the Ministry of Public Security’s Index of Serious Crimes, and was provided by the Ministry. The Index includes murder, assault, manslaughter, attempted murder and serious injury. Caution should be used in comparing this to the UCR statistics for violent crimes in US cities (see fn 8).

9 Reflects the percent of the population that is Arab.

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1. 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). [↑](#footnote-ref-1)
2. Crime trends are based only on geocoded data from the three American cities because the geocoding rates are very high and this allows us to isolate 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. [↑](#footnote-ref-2)
3. In 15.5% percent of the articles, multiple units were identified.  In such cases, we counted the article as including each of the units that were noted.  Accordingly, the percentage estimates in the figure represent the percent of the total number of empirical articles that included that unit. [↑](#footnote-ref-3)