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BASIC FACTS

HOW FREE COMPUTER SOFTWARE AND REGULARLY COLLECTED DATA CAN BE USED TO EXPLORE CRIME IN URBAN ENVIRONMENTS

by Robert Zuchowski, Loyola University New Orleans

Crime happens in some urban neighborhoods much more than in others – as police and researchers have known for a long time. The geography of crime has long been of interest and core findings today remain much as they were in the early part of the 20th century. But now much more can be learned with the aid of computer tools such as Geographic Information Systems software and electronic capacities to collect and store large amounts of data. My research uses these advances in computer technology and data collection to analyze spatial patterns of crime in the city of New Orleans – and my preliminary findings highlight the relevance of racial and income inequalities.

Geographic Information Systems and Big Data

As computer systems go, Geographic Information Systems are not particularly complex and they can be used by many people, not just tech-savvy individuals. Without understanding the technical details, most people already use smart phone and navigation technologies based in geographical information that can be manipulated electronically. In the most basic sense, geographic information systems have been around for a long time – think of wall maps with push pins representing unique places. Nevertheless, modern geographic information technology has two prominent benefits over its predecessors:

- Computerized technologies are readily available in both commercial and open-source form. Policymakers at all levels of government can use this software, regardless of budgeting concerns – and many others, including scholars and interested citizens, can use these systems as well.

- Many types of information and data can be connected, not just because of computerization but also due to the advent of *big data* – a concept that refers to information routinely collected as a part of normal organization operations and amassed at a large scale. By storing and manipulating such data, policymakers and officials can analyze geographically linked information about matters ranging from economics to health and the incidence of crimes.

Geographic Information Systems allow users both to explore patterns and do more *inferential* analyses. Inferential applications are generally done by advanced users, but descriptive explorations can be completed by anyone with a basic understanding of point-and-click computer programs. Such explorations can be as simple as matching city maps with various color shadings to represent the socioeconomic characteristics of different areas. Easily produced maps provide a valuable new way to look at information and make policy decisions – such as where to direct police or public health resources in a city.

The Geography of Crime

From studies of crime in France in the 1830s to hundreds of the more recent studies, researchers have repeatedly shown that communities and neighborhoods inhabited by people with different social and economic characteristics have different levels of crime. Some of the socioeconomic and demographic characteristics frequently found to be associated with higher crime levels include racial heterogeneity, poor quality housing, high levels of poverty, unusual proportions of single and female-headed households, and high concentrations of juveniles. These factors are *not* associated with higher levels of crime in a geographic area because they directly create crimes. Instead, alone or in combination, such factors signal an area that is more likely to be *socially disorganized* – that is, a community or neighborhood with weak social ties and institutions of the sort that keep most people safe and focused on constructive pursuits. Socially disorganized neighborhoods and communities generate more criminals and allow criminals to commit infractions more readily.

Where Crimes Happen in New Orleans

I started my research on New Orleans by collecting data on calls for police service from the official city website. This information includes a description of each crime incident plus the time, date, and geographic location. My data may be considered a form of Big Data, because they are automatically collected and stored by the New Orleans Police Department, which in its normal operations records up to half a million incidents each year. In addition, I collected and coded socioeconomic and demographic data for groups of neighboring New Orleans blocks from the U.S. Census Bureau's American Community Survey dataset. For the analysis, I used a combination of open-source geographic information software programs that are readily and freely available online with accompanying tutorials, lessons, communication forums, and walk-through guides. Together, the programs provide many opportunities for spatial analysis.

My preliminary findings reveal key social and economic correlates of crime in New Orleans:

- Most basically, the analysis shows New Orleans residents are very much sorted into different neighborhoods by race, economic standing, and susceptibility to crimes. Some areas of the city have high concentrations of whites, while others are mostly black. Race is correlated with socioeconomic advantage or disadvantage, and places with many low-income residents, disproportionately black, experience higher levels of crime. These patterns are similar to those documented for many other metropolitan areas in the United States.

- As expected, the social characteristics and dynamics of various areas within the city are strongly associated with crime. New Orleans communities with many minority and low-income residents tend to be more socially disorganized – and certain crimes happen much more frequently in those areas. Places with a higher density of non-white residents and a lot of lower-income housing have significantly higher rates of homicides and residential burglaries. The race and income of residents does not, in itself, cause such serious crimes. But instabilities and weak social ties in less privileged neighborhoods give freer rein to them.

My analysis and others like it will continue to pinpoint the places within New Orleans and other cities where crimes of particular types are most likely to happen. Aided by powerful new technologies that can analyze huge arrays of data, this work can lay the basis for improved resource allocations and better responses by authorities responsible to ensure public safety and address the social breakdowns that allow crime to plague some neighborhoods more than others.