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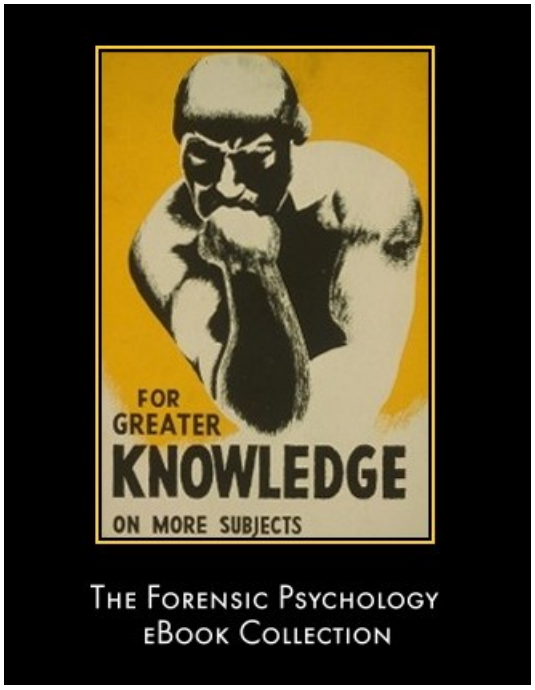

Presents

Predicting A Criminal's Journey To Crime

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Predicting a Criminal's Journey to Crime

Phil Canter sits at his computer desk at the Baltimore County Police Department's main office in Towson, Maryland. Canter calls up the menu for CrimeStat, a computer program that helps police organize data and analyze crime patterns. Canter makes a selection from the program, then calls up Regional Crime Analysis Geographic Information System (RCAGIS), another crime-fighting computer program.

Soon, a detailed street map of Baltimore County appears on the computer screen. With a few more keystrokes, Canter zooms in on one part of the county. Next, he pulls up a list of all sexually related home burglaries that have been reported in that area within the past 6 months. With a few more keystrokes, Canter locates the precise sites of each reported crime on the map, along with the area's buildings, waterways, and other manmade and natural features. Then he adds a list of known sexual offenders, separates them by method of operation, and keys in their last known addresses. Eventually, a list of possible suspects is generated.

Location: The Key to Solving Crimes?

The utility of these computer programs as crime-solving tools is promising. "We can use computer programs to analyze crime patterns and depict geographically where certain crimes are clustered, relate those crimes to the environment in which they occur, and identify where the potential suspects most likely live," says Canter, chief statistician for the Baltimore County Police Department. "That's as

important [to solving crimes] as a suspect's description. It helps police understand better the areas where crimes occur. And it lets them focus on suspects with the highest probability of [having committed] the crime."

In recent years, several police departments have added computer programs to their arsenal of anti-crime tools. Although still an imprecise science, computer programs have been or are being developed that can help police locate crime "hot spots," spatially relate a list of potential suspects to actual crimes, profile crimes geographically to identify where a serial criminal most likely lives, and even forecast where the next crime in a series might occur.

One of the oldest approaches to using computers to analyze crime patterns is known as geographic profiling. Developed in the late 1980's, geographic profiling involves the use of computer models to spatially analyze crime sites so that investigators can determine the most likely areas where an offender lives. "Geographic profiling assigns probability values to particular geographic areas," says D. Kim Rossmo, a research professor at Texas State University in San Marcos who helped develop the model. "It tells police where to look first."

Geographic profiling is most useful, Rossmo says, in cases where the same person or group of persons has committed a number of crimes such as murders, sexual assaults, robberies, bombings, or arsons. It is particularly helpful when offenders commit crimes at different sites, where two crimes are committed at once (such as a rape in which the victim's purse is also stolen), or in cases where an assault or theft victim's credit card is subsequently used at various locations.

In undertaking geographic profiling, Rossmo and other trained profilers typically review the case files and talk to police investigators to make sure that the case is an appropriate one for this specific approach. Next, profilers tour the crime sites to visualize what happened and see if anything was missed. Then they run the information through Rigel™, a computer software package that analyzes crime sites. The profiling process, which includes preparation of a written report identifying the most probable areas where an offender might live, usually takes about 2 weeks, he says. As a result, most profilers are only able to complete about 20 cases a year. As a practical matter, that limits opportunity to use geographic profiling to cases of local or national significance.

CrimeStat: Hitting Home

CrimeStat, one of the models used by Baltimore County's Canter, is a stand-alone spatial statistics program for the analysis of crime incident locations. Developed under grants from NIJ to Ned Levine and Associates, CrimeStat III Software is free and can be downloaded from the Internet at http://www.icpsr.umich.edu/NACJD/crimestat.html.

The program makes use of data derived from geographical information systems (GIS), which combine digital, computer-generated maps with data that can be displayed and manipulated. CrimeStat includes a component known as the journey-to-crime module, which is one aspect of the multifaceted geographic profiling technology.

CrimeStat builds on one simple concept: criminals have to start from somewhere when they set out to commit a crime. On the basis of the location of incidents committed by the serial offender, the journey-to-

crime module makes statistical guesses about where the criminal is likely to reside. Those guesses are based on the travel patterns of a sample of known serial offenders who committed the same type of crime. Based on the theory that most crimes are committed close to an offender's home, the module estimates the distance serial offenders travel to commit crimes and, by implication, the likely location from which they begin their "journey to crime."

The presumption underlying this analysis is that offenders, when confronted with more than one possible location for committing a burglary, will select the one with the greatest potential payoff and the least travel time. This pattern may vary, however, by type of crime. For example, although most rapes, burglaries, assaults, and other crimes of opportunity fit this pattern, more deliberative crimes—like auto thefts and commercial robberies—may occur farther from home, maximizing the offender's potential reward and decreasing his or her risk of being recognized. By plotting the location of crimes committed by a serial offender and then using a model of travel distance to estimate the offender's likely area of origin, the program attempts to lead law enforcement officers to the offender's own neighborhood.

But Do They Really Work?

Beyond serving as research projects and interesting toys for crime analysts, the key question remains: Do sophisticated computer programs work? The answer isn't a simple "yes" or "no." Daniel Helms, a crime analyst with the National Law Enforcement and Corrections Technology Center (NLECTC) in Denver, believes they do. Computer models "are not a magic bullet, but they are powerful tools [that] give

police a better starting place for following up leads and checking out lists of known offenders," he says.

To illustrate his point, Helms cites the case of the Las Vegas, Nevada, police who used CrimeStat and other computer models to identify a probable area where a serial killer lived. Based on that information, police canvassed a large apartment complex in that area and questioned residents if they had seen anyone who matched the description of the killer. Normally, the police might have overlooked that apartment complex because it was not the residence of any known suspect; however, because of the information provided by CrimeStat, they staked out the complex and ultimately arrested a suspect. In this case, CrimeStat gave police an "insight into crime and criminals not available before," Helms says.

The case of the "blue bandana bandit" in Glendale, Arizona, is another example of the value of computer models in solving crimes. In this case, police knew that a suspect wearing a blue bandana had committed a series of robberies at a chain of convenience stores. Glendale crime analysts and police detectives used a geographic information system to plot where the robberies had occurred and then used CrimeStat to predict where the next one might take place. Police staked out that convenience store and made an arrest.

Critics Weigh In

But not all crime analysts are convinced that geographic profiling and other computer models work that well. Richard Block, a professor of sociology and criminal justice at Loyola University in Chicago who

works on CrimeStat and other computer models, questions their utility. “[Computer models] have not been adequately tested to know whether they will work better than a detective’s intuition,” he observes. “This is a very new field that is still being developed.”

The belief that no computer model, however effective, will eliminate the need for good old-fashioned police work is shared by critics and proponents alike. “Police still need to use their own intuition and other information when investigating crimes,” Phil Canter acknowledges. “Computer models supplement what detectives find on their own. They can provide insights into the travel patterns of criminals, but we should not take them as gospel.”

Effectiveness Depends on Law Enforcement Input, Acceptance

A related problem, Canter notes, is that CrimeStat and other computer programs depend on the accuracy and thoroughness of the information obtained by law enforcement officers. Sometimes the most basic GIS data are incorrect, especially the addresses of known offenders and other suspects. Too often, notes Brian Hill, a police department crime analyst in Glendale, Arizona, officers have to rely on self-reported data from unreliable witnesses and suspects.

Additionally, many police officers are not familiar or experienced enough with sophisticated computer programs to use CrimeStat and other programs effectively. Using these programs requires training as well as an ability to understand technical manuals and interpret statistical results. “You can’t just plug in the computer and start the

program," NLECTC's Helms adds. "You have to understand how it works."

Origins of Journey May Vary

More importantly, offenders may not always start their journey to crime from home, says Derek Paulsen, assistant professor of criminal justice at Eastern Kentucky University in Richmond. In some cases, criminals may start from their workplace, or a friend's or relative's home. Alternatively, the journey may start from a spot where the individual hangs out—which may also be the place where he or she purchases drugs. And because criminals tend to move so often, an address that is correct one day may be out of date the next. These variables directly impede analysts' abilities to identify a criminal's journey to crime. Applying this theory is more complicated than drawing a straight line from a suspect's home to a crime site.

Moreover, today's mobile society makes predicting where offenders started their journey to crime based on known crime sites very difficult. Take, for example, the case of the snipers who launched a series of random shootings in 2002 that terrorized Washington, DC, and its suburbs, killing 10 people and wounding another 3. Despite using geographic profiling and other computer models in one of the most intense police manhunts in U.S. criminal history, the suspects were identified based on clues provided by one of the snipers about a seemingly unrelated case in Alabama. Moreover, despite implementation of a massive law enforcement dragnet for the two suspects, they were ultimately caught after an alert motorist saw them sleeping in their car—50 miles from the closest crime scene.

The sniper case also illustrates the limits of any computer program to adequately analyze the complexity of human behavior, says Ronald Wilson, program manager of the Mapping and Analysis for Public Safety (MAPS) program at NIJ. “There is a lot in human behavior that cannot be accounted for by mathematical models,” Wilson notes, pointing to the more intelligent criminals who deliberately try to vary their methods of operation to confuse or foil police.

Looking Into the Future

How long will it take before sufficient research and testing have been completed and CrimeStat and other computer programs can be recommended for use by police departments? Loyola University’s Block predicts they may be sufficiently accurate and reliable to use in a year or two. “They have a lot of promise,” he says. “They are a potentially very useful tool in solving crimes.”

In the end, however, no single police technique will work every time for every case. In some cases, computer programs may provide the key to solving crimes; in others, however, traditional police work will make the difference. “If we can better understand crime as a series of trips in time, space, and distance,” observes Ned Levine, “maybe we can begin to predict where crimes will be committed and where the offenders came from.” To accomplish this goal, however, more complex and realistic computer programs must be developed.

THE END

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