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ORIGINAL ARTICLE

Analyzing crime foreseeability: premises security litigation and the case of convenience stores and gas stations

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Abstract

Over the decades, the social and behavioral sciences have become increasingly integral to the assessment of crime foreseeability in criminal and civil court cases. This paper uses case examples from litigation involving convenience stores and gas stations to describe the analytical steps of a forensic criminological investigation to assess crime foreseeability. We describe the investigative tasks of a premise security lawsuit and address the challenges of examining and explaining the etiology of a criminal attack. A major goal is to demonstrate the translation of social science knowledge into actionable legal outcomes. The paper offers insights to enhance the investigative quality of forensic criminological assessments of crime and improve forensic applications of criminological theory and social science methods.

Keywords Crime · Crime foreseeability · Forensic criminology · Premises security · Convenience stores and gas stations

Introduction

In this paper, we describe the ways in which a forensic criminologist can apply criminological methods and analytical techniques to explain the etiology of crime events at convenience stores and gas stations, otherwise known as "congas" stores. As discussed by Kennedy (2013, 2014), Savard and Kennedy (2017), Petherick and Ferguson (2017), and Petherick et al. (2010), forensic criminology is an interdisciplinary field of study that uses behavioral and social science methods and theories to determine adjudicative or case-specific facts, and provide general contextual information to assist the courts in determining negligent behavior. Forensic criminology includes standard social science methods for collecting data and a rich body

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of criminological theories to render an opinion on crime foreseeability and security adequacy for a client (plaintiff or defendant). As consultants, forensic criminologists provide assistance to the courts in understanding the nature of crime, assessing crime data, and evaluating criminological evidence (Kennedy 2006; Kennedy and Homant 1988). Contributing to this burgeoning field, in recent years, scholars and researchers have published a number of books and articles that offer suggestions and advice on how to apply social science methods and theories to assist the courts in deciding litigation cases (Gotham and Kennedy 2019; Morewitz and Goldstein 2014; Forsyth 2014; Burns 2008; Hirsch and Quartaroli 2011; Weiner and Otto 2013).

For decades, researchers have discussed and debated the linkages among neighborhood-based conditions, store designs, place management activities, and security practices in generating or mitigating crime at convenience stores and gas stations. According to the National Association of Convenience Stores (NACS) (2017), there were 154,958 convenience stores in the United States as of December 31, 2017. Overall, nearly 80% of convenience stores (122,552 total) sold fuel. Convenience stores and gas station businesses tend to have cash on hand, offer food and refreshments, including alcohol sales, and are lightly staffed. The combination of easy access, shopping convenience, and high volume of patrons can provide fertile opportunities for potential offenders, potential victims, and weak guardianship to come into contact (White and Muldoon 2015, pp. 280–281). Cashiers working at gas stations and convenience stores face a higher rate of workplace violence than almost any other non-law enforcement profession, according to a 2011 report from the U.S. Department of Justice's Bureau of Justice Statistics (Harrell 2011). Police departments and others have long characterized convenient stores as "stop and rob" referring to how criminals can supposedly easily and often rob convenience stores.

Our chief concern in this paper is to demonstrate the usefulness of forensic criminology as a research tool that can reveal novel relational dynamics among crime events and the larger socio-spatial context in the assessment of crime foreseeability. We first describe the nature of crime and security efforts at convenience stores and gas stations. Next, we discuss the concept of foreseeability as it relates to premises liability for negligent security. Negligent security is a theory of premises liability law that victims of crime assert against owners and occupiers of land for failing to prevent foreseeable and avoidable criminal attacks from occurring. We then present two case examples of premises security litigation to demonstrate how a forensic criminologist can use social science methods to generate criminological knowledge to assist courts in making legal decisions. In doing so, we point to the strengths of triangulation, that is, multi-method analyses of crime foreseeability in which a forensic criminology leverages the unique strengths of different research methods to generate insights that may not be obtained using one method. In conclusion, we discuss several implications of our research and offer lessons for the practice of forensic criminology.

Crime and security practices at convenience stores and gas stations

The very features and design of convenience stores and gas stations that make them attractive for purchasing consumable products can make them attractive to motivated offenders looking to commit criminal activities. Convenience stores and gas stations tend to offer long business hours (compared to grocery stores and department stores) and are open on most holidays. In addition to their small size and extended hours, convenience stores and gas stations tend to have a small number of employees on hand and the majority of purchases in cash. The inventory of a convenience store and gas station is typically limited to high-convenience items and food basics that people commonly use and need quickly, such as toilet paper, soft drinks, gas, and microwavable and prepared foods. Clarke (1999) notes that consumable goods are at a higher risk of theft if they are CRAVED: Concealable, Removable, Available, Valuable, Enjoyable, and Disposable. Theft rates of products correlate with CRAVED indicators and various analyses indicate that locations that sell an abundance of CRAVED products can become crime attractors (Armitage et al. 2018; Smith and Clarke 2015, 2018; Smith 2018). In addition, the widespread adoption of mobile scan and payment systems in convenient stores and gas stations can create fertile opportunities for crime in which "scan and rob" becomes another avenue for offending (Beck and Hopkins 2017).

Over the decades, criminologists have learned through research that the crime vulnerability of convenience stores and gas stations is not universal and omnipresent but is contingent and situationally specific. That is, different premises will have different levels of crime risk due to neighborhood-based, locational and situational characteristics that can intensify or lessen the criminogenic nature of some convenience stores and gas stations. In their analysis of "risky facilities," Clarke and Eck (2007, p. 7) reported that a national survey from the National Association of Convenience Stores (1991) found that 6.5% of U.S. convenience stores experienced 65% of all convenience store robberies. In a comprehensive review of the literature from the 1980s and 1990s, Erickson (1998, p. 11) maintained that "nearly 80% of stores, in a particular year, do not have any robberies. In 1990, only 13% of convenience stores experienced one robbery, and only 7% had two or more than year." More recently, in a study of crime at convenience stores in Glendale, Arizona, White and Katz (2013) found that while only 15 Circle K stores in Glendale represented 23% of all convenience stores in the city, these stores were responsible for almost 80% of police calls for service at all convenience stores in the city in 2010. Several of these stores experienced more than 500 calls per year. The takeaway here is that only a small proportion of convenience stores have crime, with most stores having no crime at all (Altizio and York 2007; La Vigne 1994).

The location, security features, and character of a convenience store and gas station can entice offenders looking to exploit potential crime opportunities (e.g., weak guardianship) to achieve instrumental criminal goals. Assault rates tend to be higher at convenient stores and gas stations that sell alcohol (Costanza et al. 2001; Gorman et al. 2005; Gruenewald and Remer 2006; Livingston 2008; Parker

and Rebhun 1995; Roncek and Pravatiner 1989). Convenience stores located in socio-economically depressed areas can be sites of loitering and the potential for crime becomes more acute because of the inverse relationship between income and "street" crime (Greenberg and Rohe 1984; White 1990; Ellis et al. 2009, pp. 60–62). Some convenience stores and gas stations can be a hangout for youth, with crime as a side effect (Spellman 1995; Schlosser 2004, pp. 78–87; Scott 2004, pp. 5–6, 9; Block et al. 2004, pp. 211–217). In addition, many convenience stores and gas stations are located near highways and major transportation arteries, a situation that allows for an easy quick get-away after committing an offense. The possibility of a speedy escape for an offender arises from the fact that convenience stores are designed to be easily accessible (Calder and Bauer 1992; Duffala 1976; Nasar 1981). Corner locations make businesses more attractive targets because of the availability of four directions of escape rather than two (Kennedy 1991, p. 58).

Much criminological research has examined the use and effectiveness of different security efforts and programs at convenience stores and gas stores (for overviews, see Hunter 1999; Erickson 1998). During the mid-1970s, the 7-Eleven Corporation adopted security measures initially recommended by Crow and Bull (1975) based on, among other factors, the perspectives of armed robbers. Various physical changes to stores included posting signs regarding low cash; keeping windows free for employees to see outside vehicles and pedestrian movement, and for potential shoppers and pedestrians to see inside; moving the cash register to the front of the store; increasing lighting inside and outside; eliminating escape routes; and training employees in robbery prevention techniques (D'Addario 1982; Erickson and Lins 1998). As discussed by Erickson (1998, p. 4), from the point of view of robbery prevention, these countermeasures were designed to "persuade the robber there is little money available; maximize the perceived risks for the robber; maximize the probability of the robbery being witnessed; convince the robber he may be recognized; alter the escape routes or provide obstacles to a quick and easy exit." Chambers (1997, p. 3) concluded that the results of research undertaken by Crow and Bull (1975) supported "the concept that robbers select their targets and that physical and behavior changes at the store can significantly reduce robberies."

In short, criminologists have long known that the relationship among criminal events and convenience stores and gas stations is multifaceted and nuanced. Rather than assuming that convenience stores and gas stations in general are crime prone, criminologists recommend that we investigate the specific characteristics and contexts associated with crime opportunity at particular places (Gotham and Kennedy 2019). A forensic criminologist can draw on extant criminological research and methods to compare the socio-spatial characteristics of high crime stores to those of low crime stores that are suggestive of high or low crime foreseeability (Eck et al. 2007; Eck and Eck 2012). In addition, she or he can use comparisons of different convenience stores and gas stations to point to the role played by place management decision choices (e.g., store location; property characteristics; staff, training, and security; marketing strategies) in preventing criminal events or creating and exacerbating criminogenic conditions (e.g., Clarke and Bichler-Robertson 1998; Madensen and Eck 2008; Mazerolle et al. 1998).

The criminologist can also draw on at least four theories to explain why some convenience stores experience more crime than others: (1) Neighborhood hypothesis—stores in bad neighborhoods will produce more crime than bars in good neighborhoods; (2) Management hypothesis—management can influence who frequents the store and how they behave regardless of neighborhood characteristics; (3) Patron hypothesis—high crime convenience stores and gas stations are places where people who commit crime congregate; the amount of crime at a particular convenience store or gas station depends on the number of offenders who frequent the establishment; (4) Behavior setting theory—the characteristics of the patrons, neighborhood, and management will create a standard for behavior that will either generate encourage or discourage deviant actions (Madensen and Eck 2008, p. 112).

That is, crime is neither random nor evenly distributed across different convenience stores and gas stations. Thus, any analysis of why and how a crime event occurred at a particular convenience store or gas station will need to examine the criminal history of the property, socio-economic characteristics of the neighborhood, the level of security at the site, and the nature of the victim and offender.

Establishing a duty: investigating foreseeability in premises security cases

Attorneys often retain forensic criminologists to undertake investigations of crime foreseeability and to evaluate the criminogenic nature of commercial establishments and land-uses in lawsuits involving premises liability for inadequate/negligent security. In order to prove his or her case of premises liability for negligent security, a plaintiff must establish by a preponderance of the evidence that (1) the defendant owed the plaintiff a duty to protect him or her from reasonably foreseeable criminal assaults; (2) the defendant breached his or her duty by failing to act as the duty required; (3) the defendant's breach of duty was the cause-in-fact and proximate cause of injuries sustained by the victim of the assault; and (4) the plaintiff suffered harm or injury. The concept of harm translates to financial damages a court awards to a plaintiff. The party who initiates the lawsuit and requests compensation for harm must clearly establish proof of all four essential elements of a lawsuit mentioned above. A defendant will not be held liable if she or he owed no duty of care to the victim under the facts of the case; she or he exercised reasonable care in fulfilling their duty to the victim; or his or her actions or lack of actions did not cause the alleged damage or injury to the plaintiff.

In a case alleging negligent security, a plaintiff may claim that a property owner did not use ordinary care to protect business invitees from reasonably foreseeable risks of injury. Proving a defendant had a duty to prevent or minimize violent crime is fundamental in inadequate/negligent security cases (Kennedy 2006). The key factor in this inquiry is the concept of "foreseeability." In the U.S. civil court system, attorneys, judges, and juries may rely on the investigation and evaluation of a forensic criminologist to assess and determine the foreseeability of a crime given a specific set of facts. That is, a key question to address in a negligent security case is whether "there was sufficient information available that a reasonably prudent person

would have been aware of the danger" (Homant and Kennedy 1997, p. 5). While specific definitions of the legal concept of foreseeability vary by state, most states embrace a notion of foreseeability as "a reasonable or likely consequence of an act" (Black et al. 2009). Most jurisdictions use variations of this definition such as "reasonably likely to occur," "reasonable cause to anticipate," or "appreciable chance."

In order to provide guidelines on how to apply foreseeability to the fact pattern of a case, many jurisdictions embrace particular "tests" of foreseeability. While a definition of foreseeability is useful in orienting the forensic criminologist to the concept, a test of foreseeability suggests which analytical steps a court is likely to follow in order to determine whether a certain crime was foreseeable, and thus whether there exists a duty to protect (Calder and Sipes 1992; Jacobs 2005, 2006). For analytic purposes, a forensic criminologist should consider foreseeability as a continuous rather than a discrete variable and evaluate foreseeability on a continuum from not foreseeable to highly foreseeable (Homant and Kennedy 1997; Petherick et al. 2010, pp. 246–247; Voigt and Thornton 1996). In general, courts use four basic tests of foreseeability in premises liability for negligent security cases. These tests include the imminent harm test, prior similar acts test, totality of circumstances test, and the balancing test. Box 1 provides an overview and description of these four tests of crime foreseeability.

Box 1: Four tests of foreseeability

(1) Specific Imminent Harm Test A landowner does not owe a duty to protect patrons from the violent acts of third parties unless she or he is aware of specific imminent harm about to affect them. Major Cases: *Taboada v. Daly Seven*, Inc., 271 Va. 313, 626 S.E.2d 428 (2006); *Delta Tau Delta v. Johnson*, 712 N.E.2d 968, 973 (Ind.1999)

(2) Prior Similar Incidents Test In order to establish foreseeability requiring a landowner to take precautions against third-party crime, the plaintiff must establish a past history of similar criminal conduct on or near the premises. Major Cases: *Timberwalk Apartments, Partners, Inc.,* et al. *v. Cain* (972 S.W.2d 749 Tex. 1998); *Trammell Crow Cent. Texas, Ltd. v. Gutierrez,* 267 S.W.3d 9 (Tex. 2008); *Doe v. Wal-Mart Stores, Inc.*, 479 SE 2d 610—W. Va: Supreme Court of Appeals (1996)

(3) Totality of Circumstances Test This test looks to a host of factors such as the nature, condition and location of the land, the level of crime in the surrounding area, and any other factors that may alert the landowner to the likelihood of crime. Major Cases: *Isaacs v. Huntington Memorial Hospital* 211 Cal.Rptr. 356, 695 P.2d at 659; *Clohesy v. Food Circus Supermarkets, Inc*., 694 A. 2d 1017—NJ: Supreme Court 1997; *Richardson v. QuikTrip Corp*., 81 S.W.3d 54 (Mo. Ct. App. 2002)

(4) The Balancing Test This test seeks to address the interests of both business proprietors and their customers by balancing the foreseeability of harm against the burden of imposing a duty to protect against criminal acts of third persons. Major Cases: *McClung v. Delta Square Ltd. Partnership*, 937 S.W.2d 891 (Tenn. 1996); *Posecai v. Walmart Stores, Inc*. 753 So.2d 762, 767-68 (La. 1999)

Below, we analyze forensic criminological reports from two litigation cases to demonstrate the uses and applications of social science methods and theories in the applied setting of the civil court system. In the context of a premises security lawsuit, a forensic consultant will review and analyze various data sources produced during the discovery process of the litigation or otherwise obtained through

research, investigation, and/or other legal means. The forensic criminology can review and analyze the different data to identify the individual-level and contextual factors that may be responsible for the criminal event.

Analysis and assessment of crime foreseeability

Case example: assault of a gas station customer

The second author was retained by a plaintiff's attorney to consult on a case involving an assault of a man at a gas station. The man was traveling with his wife from Alabama to Texas and stopped in order to refuel and use the restroom facilities. While he was pumping gas, the store employees decided to close the business earlier than the usual closing time. The employees locked the building doors and turned off the canopy lights over the gas pumps. When asked by the customer to turn the lights back on and unlock the doors so he could finish pumping gas and use the facilities, the gas station employee refused to do so. A verbal disagreement erupted as a local resident appeared on the scene riding his bicycle. He then assaulted the customer. The offender was prosecuted for the attack and the victim initiated a negligent security suit against the gas station owner.

Before arriving at any opinions in this matter, the forensic criminologist reviewed depositions of five individuals; reviewed the complaint and answers to interrogatories as well as franchise documents; analyzed printouts of Calls For Service (CFS) from the local police department and other records of prior incidents/calls; read the police investigative report concerning this matter; conducted two site visits to the property, one in the evening and another the following morning; studied relevant socio-economic census data for the property and surrounding area; and reviewed visual recordings of the event. The forensic criminologist assesses the foreseeability of crime based on the location of a property, the nature of business conducted there, and the history of crime at the property itself.

Nature of the neighborhood: analyzing socio-economic characteristics

In this case involving an assault of a gas station customer, the forensic criminologist begins the analysis and assessment of crime foreseeability by comparing the median household income for the blockgroup in which the crime occurred with the median household income for the state, the county, the city, and the census tract. After listing the address and census tract and blockgroup location of the gas station, the forensic criminologist describes the median household income for the blockgroup for a three-year period. Next, the forensic criminologist compares this income figure to the median income for the entire state, county, city, and census tract. The median household income for the blockgroup where the gas station was located was $21,725. This compares to a median household income for the entire state of $44,874; county of $51,462; city of $37,325; and for census tract of $31,289. Thus, the median household income for the blockgroup was much

less than the state-level median income and median household income for the county. The report concludes that "the neighborhood around the congas stations was much more economically depressed by comparison."

The forensic criminologist buttresses the analysis of census data with a visual inspection of the surrounding neighborhoods. A visual inspection is important as an additional data collection tool and can be useful in corroborating data gathered through different research methods. Relevant factors to evaluate in a visual inspection include lighting, lines of sight, places of concealment, remoteness, accessibility, security measures, conditions, etc. According to the forensic criminological investigation:

> My visual inspection of the neighborhoods immediately south and west of the congas station confirmed what the economic data indicated. Many of the homes are small, wooden structures with poor upkeep. There are a number of trailer homes in poor condition and a small, run-down apartment building located just down the street from the stations. There were, however, pockets of pride and stability in the area in the form of brick family homes whose owners maintained them well. Overall, however, the neighborhoods contiguous to the [gas station] are economically disadvantaged. Unfortunately, there is an inverse correlation between income and street crime; the lower the income, the higher the crime rate (citation to Ellis et al. 2009, pp. 60–61).

The socio-economic environment is the context within which to evaluate crime foreseeability because spatial–temporal factors can suggest opportunities for motivated offenders to victimize targets at particular properties (for a comprehensive overview and discussion, see Gotham and Kennedy 2019). Decades of social science scholarship and criminological research show that neighborhoods with low household income and high poverty rates tend to have higher rates of violent crime than affluent neighborhoods (Ellis et al. 2009, pp. 36–37; Hsieh and Pugh 1993; Pratt and Cullen 2005). Other neighborhood socio-economic factors that correlate with crime include high levels of unemployment, low levels of home ownership or vehicle ownership, frequent residential turnover, meager and few business and cultural amenities, high levels of physical disorder and environmental decay (e.g., graffiti, dilapidated and burnt buildings, abandoned vehicles and appliances, trash and litter), and high levels of social disorder (e.g., open and flagrant drug sales and drug use, prostitution, and unemployed persons loitering) (Sampson et al. 1997). Many of these socio-economic factors are associated with weak guardianship and thereby with enhanced opportunities for criminal events through the convergence of suitable targets and motivated offenders (see Gotham and Kennedy 2019, pp. 75–77).

Analyzing prior similar crime incidents

Criminological research and courts recognize that the similarity of past criminal events at or near a business can be a predictor of future criminal events (Calder and Sipes 1992; Kennedy 2006, 2013, 2014). Collecting data on prior similar crime incidents is part of a broader, comprehensive crime analysis to assess crime foreseeability and thus inform the courts on whether a property owner may be liable for

negligent security. A plaintiff must show that past crime incidents are sufficiently similar, numerous, and geographically and temporally proximate to the premises to provide adequate notice to a reasonable individual that a violent crime may occur. That is, courts will assess the foreseeability of a crime event based on whether there were prior, similar crimes in the same location. The existence of prior similar incidents provides the evidence that the owner or possessor knew or should have known about the dangerous condition that resulted in the litigated incident. In the absence of prior similar incidents, a property owner may not be obligated to anticipate the criminal activities of third persons or take security precautions.

In this case, concerning the attack on a gas station customer, the forensic criminologist receives ten pages documenting police activity at the gas station. The report notes that sometime in the past, the gas station owner had decided to hire security officers to surveil and patrol the gas station. According to the forensic criminological investigation:

> I did note a number of problems at the [property]. For example, in a three-year period prior to the attack on [the gas station customer], there were police entries concerning five reports of drugs, seven reports of assault, five "disturbances" and one threat at the two properties. Drug activity on or near a property is often an indicator of violence potential [citation to Goldstein 1985]. Thus,…it would seem [gas station owner's] initial decision to provide for security personnel at [the gas station] was well taken. In this case, I am of the opinion that the criminal act in question was foreseeable to [gas station owner].

Both the courts and extant criminological research suggest that prior criminal assaults on a defendant's property can make another assault reasonably foreseeable. That said, several incidents of non-violence (e.g., property vandalism) on the defendant's premises do not make a violent crime at that same location reasonably foreseeable (Voigt and Thornton 1996, p. 176). In addition to collecting data on prior similar incidents, a forensic criminologist should gather other crime data including property crime data. High levels of non-violent crime on or near the property—theft, shoplifting, car break-ins—can suggest opportunities for more serious crimes against customers. In addition, according to Voigt and Thornton (1996, p. 176) "although the numbers of minor property crimes may not be valid indicators of future crimes of violence, they can indicate the relative adequacy of security." The nature of third-party criminal events and past crime incidents on or near the premises generally dictate and prescribe the level of security necessary at the premises.

Evaluating levels of security and the advantages of methodological triangulation

In premises liability cases, foreseeability is an element of both duty and causation. That is, foreseeability is factor in the analysis of whether the property owner owed a duty to the injured person, and whether the alleged failures of the property owner to provide adequate protection caused the injury. Thus, in some cases, the question of negligence centers on whether the premises owner should have provided security measures that would have reduced the probability of a certain type of criminal attack. In jurisdictions that follow the totality of circumstances test, the absence of

prior similar incidents does not mean that the business owes no duty to protect its customers against third-party criminal acts. A business owner's adoption of a written security plan with a security policy, security budget, and set of security procedures can suggest a recognition of a need to implement security measures to protect customers from reasonably foreseeable criminal events. Providing security lighting, contract or proprietary security guards, and target hardening and access control measures (e.g., warning signs, fencing, electronic monitoring systems, intrusion detection devices) can indicate that the premises owner is aware of security problems and is taking action to safeguard the property.

After considering the issue of duty to protect and the question of foreseeability, a forensic criminologist will consider whether a business owner defendant breached or violated the duty. A forensic criminologist will conduct an analysis of the breach of the duty of care by examining the presence or absence of adequate security at the premises. In a negligent security case, the plaintiff may allege that the defendant's security (in)actions were negligent and in violation of the appropriate standard of care. Here, forensic criminologists should research any standards promulgated by various professional associations, the defendant's own policies, community practices, and learned treatises (Gotham and Kennedy 2019, pp. 55–60; Kennedy 2006). A forensic criminologist's analysis should typically focus on the steps taken by the defendant to protect the plaintiff from, or warn the plaintiff about, the possibility of criminal activity.

In this case, the forensic criminologist provides an evaluation of the levels of security at the gas station and notes the connections between the lack of reasonable security measures and the plaintiff's harm.

> It is obvious to me that no franchisor would tolerate the damage done to its brand by franchisee employees who turn off canopy lights before closing time especially while a customer is handling gasoline. This constitutes a safety hazard to the customer as well as the incivility of denying that customer access to restroom facilities. Because of the large glass windows across the front of the store and video evidence of her actions inside the store, [the clerk] could also have seen the arrival of [offender], an individual who was a frequent loiterer and known to the police.
>
> Still, she denied [the customer] entry into the store. This same clerk later refused to cooperate with police officers investigating the attack on [the customer]. Such disregard for the safety of customers suggests inattention by the store's owner… to reasonable personnel practices such as proper hiring, training, retention, and supervision of employees. In effect, [the clerk] abandoned the [customer] in an unfamiliar parking lot as they handled a hazardous substance under reduced lighting conditions in the presence of a grown man known to be a loiterer (with frequent police contacts).
>
> Another violation of the standard of care concerns the termination of guard services without ascertaining whether there had been a concomitant decrease in the threat conditions which prompted their hiring in the first place. Canceling guard services for strictly economic reasons or because

> of an impending sale of properties places economic concerns over the safety of invitees. This is a violation of the standard of care in that a threat had been acknowledged and preventive measures such as posting guards were having a positive effect, yet these measures were terminated without a diminution in threat level. If incidents had been reduced because of the presence of security, it is illogical to conclude that security was no longer needed. This is not to say that guard protection, once instituted, must be continued indefinitely. If a threat level no longer exists or has substantially diminished, it may be entirely appropriate to cancel guard service or to substitute other protective measures. This was not the case in this instance.

In this case, the forensic criminologist uses a strategy of triangulation to gather data from several different sources and methods to assess the credibility and validity of the claims being made in the case. Triangulation is strategy of "checking different data against each other to elaborate, refine, or evaluate a particular interpretation of evidence or an inference draw on from evidence" (Ragin 1994, p. 186). We can understand triangulation "as a way of using independent pieces of information to get a better fix on something that is only partially known or understood" (p. 100). In a forensic criminological analysis, the investigator recognizes that each type of crime data has strengths and limitations. Consequently, in order to overcome the limitations of a single data source, a social scientist should use two or more methods to evaluate plaintiff and defendant claims, measure crime trends, and examine the various factors in the determination of crime foreseeability.

As part of an overall strategy of assessing crime foreseeability, deposition testimony can be a relevant factor in helping to rebut and disconfirm or confirm and deepen insights gathered from other data sources and methods. In this case, the store clerk pointed out in her deposition that there were "a lot of fights" in the parking lot occurring both night and day, and the perpetrator loitered around the store frequently. The gas station owner referred to a history of customers being assaulted, fights in the parking lot, rowdiness of youngsters, and the "hoodlum element" moving on after uniformed security was implemented. A local police officer indicated in deposition that police officers who had worked security at the store before their services were terminated were there to keep the "riffraff" out.

In short, by using the strategy of triangulation to compare different data sources, a forensic criminologist can evaluate the overall quality of the evidence and thereby help validate or refute particular claims. Forensic criminological investigation is akin to "translational criminology" (National Institute of Justice 2011) in which a forensic criminologist can bring criminological knowledge to the courts to assist judges and jurors in understanding the facts of a case and thereby help them to render a legal decision. Overall, while scholars and researchers understand that triangulation can be an important strategy for advancing criminological theory (Noaks and Wincup 2004; Wincup 2017; Anderson et al. 2011; Maruna 2010; Bachman and Schutt 2016), we wish to point out that triangulation can be an excellent technique for gaining a deeper

understanding of the factors that may affect crime foreseeability in a negligent security case.

Case example: shooting of a night clerk at a convenience store

This case concerns allegations of negligent security brought by a night clerk who was shot while working one night at a convenience store. On the night of the shooting, three culprits entered the store and proceeded to commit robbery. After the night clerk was unable to open the register quickly enough and amidst some shoving by the assailants, one of whom was armed, the clerk was shot several times and severely wounded. This convenience store robbery was the first in a crime spree in which the offenders robbed about ten more convenience stores in the following months. They were eventually caught and convicted of robbery and attempted murder. As a result of the violent incident at this convenient store, the night clerk filed a negligence complaint against the owner of the convenience store for inadequate security. In this case, the forensic criminologist reviews several depositions, video footnote taken of the robbery/shooting, three expert reports, census tract household income data, and crime data from FBI-Uniform Crime Reports (UCR) for representative years.

Analyzing crime rates

In cases involving allegations of inadequate or negligent security, a crime rate permits a forensic criminologist to "produce a precise estimate of the risk of a specific offense being committed against a specific individual at a specific place over a specific time period" (Sherman, et al. 1989, p. 42). Rates and ratios are key factors in understanding the criminogenic nature of a geographical area (Gotham and Kennedy 2019, pp. 77–83; Voigt and Thornton 1996; Vellani 2010, p. 32). Plain numbers of crime events, such as robberies, murders, or rapes may have little meaning in themselves, lacking a context in which a criminologist can situate and interpret them. Calculating crime rates supplies such a context, by transforming numerical crime data in terms of the population at risk and the relevant time period. Jacobs (2005, p. 20) notes that a crime rate provides "a scientifically acceptable way to assess the objective probability" of a crime happening to someone at a particular place. Crime rates are illustrative of crime risks and "[w]ithout such an estimate," according to Jacobs (2005, p. 20), "litigants may lack an empirical basis for determining how dangerous something is to somebody and whether that danger is ordinary and reasonable or extraordinary and unreasonable." Crime rates allow one to compare crime across different geographical areas and at various facilities. Crime rates also allow the researcher to speak of "low" or "high" crime areas through comparisons of properties of similar design and operations in the same city

To assess the criminogenic nature of the neighborhood where a crime occurred, a forensic criminologist can undertake a rate analysis of major violent crimes summarized by category and location of the criminal event. To compute the crime rate, a forensic criminologist can compare the volume of offenses experienced against

the population of the area. With this information, the forensic criminologist can compare crime across scales—e.g., neighborhood, intersection, or city. Whenever comparing crimes between two cities, however, the researcher must take into consideration the fact that city A may have more assaults than city B simply because there are more people in city A. To control for disparate population size, a forensic criminologist normally determines the crime rate per 100,000 people. The simple formula, which divides the number of crimes by the number of people and multiplies by 100,000, will allow the forensic criminologist to compare crime rates across cities and other geographical areas. According to the forensic criminological investigation of the shooting at the convenience store:

> [This convenience store] often deals in cash, just as do many other small businesses such as pizza shops, hairdresser shops, liquor stores, gas stations, bars, etc. Any such business can be robbed because there is generally only a clerk between a criminal and the money he seeks. The quality of a neighborhood is also relevant as stores in lower income areas may be victimized more frequently. [This convenience store] is located in a census tract with a median family income of $70,456 in 2017. This is certainly not a slum. [The City] had a violent crime rate of only 293 for 100,000 in 2013 compared to [adjacent city's] rate of 2,566 per 100,000 the previous year. In fact, the Violent Crime Rate for [the City] in 2012 was 308 per 100,000 compared to the U.S. average of 388 per 100,000. Further analysis did not reveal a sudden jump in crime in [the City] after [the adjacent city] forced retailers to close during later evening hours. In fact, the number of robberies in [the City] dropped from 62 in 2012 to 49 in 2013 to 45 in 2014. [Thus, this convenience store] is not located in a crime-ridden neighborhood.

Calls for service (CFS) and narrative police incident reports

Forensic criminologists may also request records of local police department calls for service (CFS) at the site and the immediate vicinity as well as narrative police incident reports. The calls for service data received should include the offense number, date of call, time of call, address of caller, and how the call was initially coded by law enforcement (e.g., murder, assault, trespassing, etc.). Criminological research suggests that CFS data can be one indicator of crime foreseeability. For example, Sherman (1987) noted that CFS data can suggest locations where crime is concentrated. As he put it, in his classic study of Minneapolis:

> The classic stranger-to-stranger crimes of robbery, rape, and auto theft are very likely to recur if they ever occur at all at a given location. Only 4% of the locations in Minneapolis had any of these calls for police service. But a location with one call had a 26% chance of having a second call within a year. A location with two calls had a 41% chance of having a third call, and a location with three calls had a 58% chance of generating a fourth call within a year (1987, p. 22)

Other researches by Sherman et al. (1989) and Weisburd and Mazerolle (2000) support the use of CFS reports as indicators of future crime in an area and, consequently, attest to their value in an analysis of foreseeability.

That said, there are limitations with CFS data and a forensic criminologist should not rely exclusively on CFS because these data can sometimes be inappropriate and misleading and some incidents may have nothing to do with crime. We address the limitations of the CFS because a security expert for the plaintiff in this case submitted a table of all CFS for 4 years at the convenience store, alleging that these data suggested a high foreseeability of crime at the premises. The problem here is that CFS can include vehicle stops on the street, and in this case, included latrine stops, building checks, 911 hang ups, and lock outs. Technical errors, 911 misdials, hang-up calls, pranks, lonely heart calls, and exaggerated emergency calls are just a few of the problems associated with interpreting CFS. For example, in this case, one CFS report of a strong-arm robbery at the convenience store was actually a shoplifting incident wherein the thief lost his shirt while struggling to escape from the store.

Savard and Kennedy (2014, p. 267) point out that "police incident reports may provide a clearer picture about the nature and types of crime occurring on a property compared to police calls for service." The latter may over or undercount crime, whereas police incident reports provide actual crime known to police and a qualitative understanding of a particular incident. Several researchers including Sampson (2004), Boba (2009, p. 85), Klinger and Bridges (1997), Vellani and Nahoun (2001, p. 29) recognize that CFS should not be used alone as a measure of prior crime and should be accompanied by narrative police incident reports. Lersch (2004, p. 13) notes that CFS "are a rather crude measure of the level of criminal activity in an area" and "one of the drawbacks of using calls for service as a primary measure of the level of crime in an area is that citizen reports of criminal activity are often not valid" (p. 14) (for a summary and comprehensive analysis of the various measurement errors in CFS, see Klinger and Bridges 1997). Actual narrative police incident reports are the "gold standard" for proper analysis of crime foreseeability at a given property. The International Association of Professional Security Consultants (2014) and the ASIS International (2003), *General Security Risk Assessment Guideline,* both endorse the use of narrative police incident reports to evaluate crime risk.

Analysis of environmental cues: crime prevention through environmental design (CPTED)

The techniques of Crime Prevention Through Environmental Design (CPTED) can be useful to a forensic criminologist in investigating whether the design and physical features of the built environment played a role in the etiology of a criminal event. Over the decades, researchers and practitioners have expressed a range of CPTED techniques and principles (Armitage 2018; Atlas 2013; Cozens and Love 2015). In the field of forensic criminology, CPTED suggests that place managers can limit the likelihood of criminal events by modifying the physical features of the premises and surrounding area. These methods can include, among others, the use of placement of activities involving money transactions in areas with high levels of activity and with surveillance opportunities; use of clear windows, lighting, and video surveillance

to detect and record unwelcome intruders; and image/space management efforts to promote a positive image with property upkeep (Armitage et al. 2018; Atlas 2013; Crowe and Fennelly 2013; for an overview, see Ceccato and Armitage 2018).

In the excerpt below, the forensic criminologist provides a summary of a visual site inspection of the premises paying attention to the use and quality of lighting, paths for pedestrian and vehicular traffic, location and control of premises entrances, and other features that may enhance the surveillance potential of the site by capable guardians.

> I inspected the premises of the [convenience] store on the evening of May 3 and toured the immediate neighborhood on the morning of May 4. My evening store visit revealed a well-lit parking lot illuminated by spotlights, a large [convenience store] sign, building lights, and ambient lighting from the public street. There are no convenient escape routes alongside the building, which is a robbery deterrent feature. The entire front of the store is glass, virtually from top to bottom; and the interior, including the cashier location, is in clear view of passers-by. An ATM inside the building brings in additional foot traffic as does the location itself in the middle of [the] … business district. In terms of the neighborhood tour, this part of [the town] is older but sufficiently maintained. I saw no abandoned buildings or boarded up homes as the area remains quite viable and can best be described as a solid heterogeneous, working class neighborhood.

The forensic criminological report for this case notes that an inventory of security measures at this convenience store shows that store owners used CPTED principles as a crime prevention tool. According to the report:

> Three components of CPTED include territoriality, access control, and natural surveillance. Territoriality involves clearly defining private from public property and conveying an image that a property is cared for (graffiti removed, refuse pickup, etc.) and will be monitored. Access control limits the ways in and out of a store and surveillance refers to the ability to detect and record unwelcome intruders through clear windows, CCTV, and good lighting. The [convenience store] program also covers cash control through frequent use of a timed-access drop safe, appropriate signage, and the availability of panic alarms. "Night ride" inspections by corporate personnel provide advice on security measures at sensitive times. [E]mployees are trained in robbery/violence deterrence measures…[that instruct]…employees how to handle aggressive customers, shoplifting, gasoline "drive offs," and robberies as well as how to respond to emergencies.
>
> Police are encouraged to visit [convenience store] frequently because of the availability of coffee and restrooms. A door entry bell signals that someone has entered, and door height markers are available to estimate an escaping robber's height. [The corporate franchisor] provides for a hot line and incident reporting system and frequently distributes security-related information flyers

and posters. In addition, corporate security consultants are made available on a regular basis to the franchisee.

CPTED suggests that the socio-spatial organization and physical environment of some places can give off powerful behavior cues that can either motivate offenders to commit crimes or deter them from initiating a criminal event. Social and physical cues—lack of natural surveillance, absence of place managers, and prominent crime targets—can suggest to potential offenders that the risks are low and the reward could be high for committing an opportunistic crime. Other environmental cues such as access control, image maintenance, security awareness, and specific target hardening measures may increase the effort and risk of offending as well as reduce the rewards associated with the commission of a crime (Armitage 2018). Properties designed with security and crime prevention in mind will consider the layout of the property, lighting, access points, sight lines, and other factors, with the purpose of creating a space where the offender feels more vulnerable to detection (Ceccato and Armitage 2018).

CCTV as investigative tool

At times, security experts may imply in their expert witness reports that video surveillance (e.g., closed-circuit television, CCTV) can be an effective crime deterrent and that a crime could have been prevented had the premises owner used CCTV. Much criminological research suggests that the linkages among CCTV and crime deterrence are implicit and unclear (Welsh and Farrington 2003; Gill and Spriggs 2005; Gill et al. 2007; Gill 2018; Ratcliffe et al. 2009). According to Piza et al. (2014a, p. 238) summary of the research on CCTV:

> CCTV has not produced consistent benefits and, in many instances, there has been little or no evidence of crime reductions. Given these findings, it is difficult to anticipate the performance of CCTV upon installation. While previous works have called for the identification of precise contexts in which CCTV best performs, little has been developed in the sense of "best practices" (citations omitted)

In this case involving a shooting of a night clerk, security experts for the plaintiff victim faulted the convenience store for not providing remote video monitoring of the store's surveillance system as a reasonable deterrent to prevent armed robberies. Likely, this would require pushing a button only when and if the clerk feels safe enough to do so. The forensic criminological report provides a rebuttal to the plaintiff's claim that enhanced video surveillance could have had a deterrent effect.

> At this point in time, I have not encountered any reputable studies which establish the deterrence value of remote monitoring. Absent such proof, remote monitoring would not constitute a standard of care. I also suggest that remote monitoring is not a widespread industry practice. I do know, however, that [this convenient store] provides internal security cameras which record robberies and are useful in the investigation of crimes. Also, [this convenient store]

> provides video monitors installed in ceilings so that all entering customers will realize they are on camera and being recorded. Theoretically, this may deter many robbers from carrying out their intentions.

As a surveillance technology, CCTV can be useful as a post hoc data collection tool in forensic investigations of crime foreseeability. In this case involving the shooting of the night clerk, a granular analysis of the robbery and shooting is possible due to the overhead camera that recorded the crime. As two robbers were grabbing merchandise, the night clerk with his back to the counter, began moving to his right, possibly towards the panic or alarm button under the counter. The third robber shot the night clerk just as he raised his right arm. The shooting may have been precipitated by the third robber's belief that the clerk was attempting to push the alarm button. According to the forensic criminological investigation:

> I do opine that [the victim's] injuries were caused most immediately either by his attempt to push a panic alarm button and/or by the shooter's irrational decision to shoot [the victim] based on the shooter's nervous fearfulness or his perverse thrill seeking [citation to Jacobs and Cherbonneau 2017; Katz 1988]. I do not know for certain if [the victim] reached for a panic alarm under the counter against all previous training or against common sense … The ground truth of this matter will have to be decided by judge or jury and not by forensic expert witnesses.
>
> Serious or fatal injury to a robbery victim is a relatively rare event…Only about one in 500 robberies, for example, leads to the death of the victim…In fact, victims who resisted were forty-nine times more likely to be killed than those who cooperated [citation to Cook 1985, pp. 480–489].

In this case, the CCTV recording of the shooting shows the actions of the victim at the moment of the shooting and provides an additional piece of evidence in the assessment of crime foreseeability. Turvey (2013, p. 444) suggests that whatever the circumstance, forensic criminologists should conduct a victimology—e.g., analysis of the relationship between an injured person and an offender—to determine whether and how victim actions or traits and contextual factors played a role in the victimization. As discussed by Voigt and Thornton (1996, p. 187), typologies of victims usually have two bases: (1) the relative responsibility of the victim for the crime (i.e., "to what degree is the victim culpable for the actions of the offender") and (2) the relative vulnerability of the victim to crime (i.e., "what social conditions or environments lead to more or less risk of crime for the person"). A forensic criminologist can use these two factors—responsibility and vulnerability—to explain the relationship between the offender and the victim. Voigt and Thornton (1996, p. 187) identify three typologies of victims:

- Complete innocence—the most commonly accepted category of victimization that includes people who did nothing that conceivably could have provoked the criminal action.

- Unintentional facilitation—unwittingly, carelessly, or negligently making it easier for a crime to occur
- Victim precipitation—when a person "willfully initiates the encounter with the eventual offender, directly enticing, challenging, insulting, provoking, or even initially assaulting the person" (p. 187)

Based on the CCTV recording, the actions of the victim appear to be an example of unintentional facilitation. That is, the night clerk's movements during the robbery were likely construed as a threat by the perpetrators of the robbery and resulted in his injuries from the use of a weapon. In this case, in the three-year period prior to the shooting, the convenience store had experienced one armed robbery per year with no reported injuries. The prior number of armed robberies is not significant from a security standpoint; however, the fact that no prior injuries occurred is significant in that it could be that store employees were following recommended procedures during those robberies. That is, the training materials provided to employees at this convenience store include instructions on what actions to take during a robbery. The instructions stress cooperation and sacrificing of money and goods to prevent injuries to both store patrons and employees.

In short, the forensic investigation in this case of the shooting of a night clerk has two implications for the use and application of CCTV systems. First, CCTV systems can be useful data gathering tools since they "can observe crime incidents in progress" (Piza et al. 2014b, p. 1020). While much debate surrounds the deterrence effect of CCTV, we believe that forensic criminologists can use CCTV as an investigative tool for checking and corroborating other data in the assessment of rime foreseeability.

Second, the surveillance footage in this case corroborates longstanding research that has documented offender willingness to operate illegally in sight of CCTV (Butler 1994; Ditton and Short 1998; Gill and Turbin 1998; Gill 2018). During interviews with prisoners, Gill and Loveday (2003 p. 19) found that most offenders did not consider CCTV as a serious deterrent because "offenders appear to believe that the notification of an incident [via CCTV] carries no guarantee that the police are able to respond quickly." Other work by Piza et al. (2014a, b), Armitage et al. (2018, pp. 136–137, 140), and Strome et al. (2018) finds that the mere presence of a camera does not generate deterrence unless the offenders know that the camera coverage will be accompanied by a real threat of apprehension. According to research by Hunter et al. (2018, p. 92): "The flaws in formal security such as blind spots of CCTV cameras, alongside the unintentional human errors in the behavior of security/retail staff…are…easily discerned and negated/exploited by…offenders."

Moreover, research suggests that the deterrence and apprehension function of CCTV varies by place. Strome et al.'s (2018) examination of the relationship between situational deployment factors and the deterrence effect of public view monitors finds that display height and border color were significant factors affecting the noticeability of cameras in retail environments. These findings corroborate those of Piza et al. (2014a, p. 238) who find that "CCTV effect is contextual, somewhat influenced by a camera's environmental backcloth, line-of-sight, ability to generate proactive enforcement, and the targeted crime type."

Our analysis suggests that CCTV can provide visual evidence for use in criminal investigations and aid attorneys and prosecutors in crime data collection and analysis (Ashby 2017). In this case of the shooting of the night clerk, the offenders may have believed that their actions would not result in arrest and capture even when recorded on CCTV. CCTV is ubiquitous in convenience stores and the fact that the offenders eventually robbed another ten convenience stores in the following months suggests that CCTV was not a deterrent. The crime preventive and deterrent effect of CCTV is one of several anticipated outcomes of video surveillance. Our analysis supports calls by Hollis (2019) and Piza et al. (2019, p. 152) to develop "a body of research on the investigatory benefits of CCTV" that can "expand the focus of CCTV evaluations to include more outcome measures than crime prevention." Findings from our forensic criminologist investigation highlight the utility of security cameras in identifying criminal offenders, confirming the sequence of events leading to a crime, and corroborating other data on the actions of victims and offenders in the commission of crime.

Conclusion

Our goal in this paper has been to show how a forensic criminologist can apply social science methods and analytical techniques to generate criminological knowledge to assist courts in the assessment of crime foreseeability. Our analysis of two cases of litigation involving allegations of negligent security suggests that theoretical and methodological insights from the social sciences may help inform jury deliberations concerning factual ingredients of crime foreseeability. Courts have long expressed the need for high quality, relevant, and reliable evidence to determine the foreseeability of a crime (Calder and Sipes 1992). By adopting a systematic approach to the analysis of evidence, a social scientist can collect a variety of data and use a rich body of criminological theories to render an opinion on the foreseeability of a criminal event. Our areas of investigation have included the following analytical steps: measuring and analyzing the socio-economic characteristics of the neighborhood and premises where the crime occurred, analyzing prior similar crime, comparing crime rates, analyzing calls for service and narrative police incident reports, investigating environmental cues using the insights of CPTED, and using CCTV as an investigative tool.

Premises security litigation defies blanket generalizations and cases involving crimes at convenience stores and gas stations cannot be easily classified or categorized. Laws and foreseeability tests vary by jurisdiction and courts will judge each case on its own merits with an understanding that properties, victims, and offenders are unique in their own ways. Voigt and Thornton (1996, pp. 188–189) point out that each case "involves an act or event, its relationship to a particular space, and the degree to which the owner or manager of the space and the victim are, in part, responsible for the unfortunate occurrence." This conception assumes that crimes are "*events* which occur at specific locations in *space* and *time*, involving specific persons and/or objects" (Cohen and Felson 1979, p. 589, emphasis in original).

Despite their diversity and different insights, what unites many negligent security cases is the importance of place and locational opportunities in the generation of the crime event (Weisburd et al. 2018). A forensic criminologist thus "imagines a world where a single act or event is embedded in a complex array of spatial, temporal, historical, and interpersonal contingencies and conditions" (Voigt and Thornton 1996, p. 189). A major lesson is that forensic criminological investigations should include socio-spatial and environmental factors, as well as measure the geographic and temporal proximity of crime, in the analysis of crime foreseeability. Failure to address these factors can limit the quality of a forensic investigation, lead to erroneous or irrelevant observations, and bias the interpretation of the findings.

Finally, our analysis in this paper suggests that forensic social scientists could enhance the quality and thoroughness of forensic criminological investigations by using the strategy of triangulation. Triangulation is not simply the act of combining multiple methods, theories, or data sources in the conduct of research. Rather, triangulation is a strategy of investigation that compares and contrasts different sources of evidence to uncover convergences, divergences, discrepancies, or complementary findings that might have remained hidden or concealed if the forensic scientist had relied on one data source or method alone. Triangulation is an iterative process of collecting and analyzing data generated in a negligent security case to answer whether a crime was reasonably foreseeable. Different data sources can have varying levels of quality and strengths. Triangulating data and methods is a technique to evaluate the quality, strengths, and weaknesses of different data sources and methods. In a negligent security case, the idea behind triangulation is that the convergence of multiple data sources and methods upon a single conclusion (e.g., high or low foreseeability of criminal event) better supports that conclusion than just relying on one method or one data source. In short, the strategy of triangulation can enhance the quality, thoroughness, and validity of the forensic criminological investigations and thereby lead to a holistic and rich contextual understanding of the etiology of a criminal event.

References

Altizio, A., and D. York. 2007. Robbery of Convenience Stores: Problem-Oriented Guides for Police: Problem Specific Guides Series No. 49. Washington, DC: Office of Community Oriented Policing Services, U.S. Department of Justice.

American Society of Industrial Security (ASIS) International. 2003. General Security Risk Assessment Guideline. Alexandria, VA: American Society of Industrial Security (ASIS) International.

Anderson, J.F., K. Reinsmith-Jones, and N.J. Mangels. 2011. Need for Triangulated Methodologies in Criminal Justice and Criminological Research: Exploring Legal Techniques as an Additional Method. *Criminal Justice Studies* 24 (1): 83–103.

Armitage, R. 2018. Burglars' Take on Crime Prevention Through Environmental Design (CPTED): Reconsidering the Relevance from an Offender Perspective. *Security Journal* 31 (1): 285–304.

Armitage, R., C. Joyce, and L. Monchuk. 2018. Crime Prevention Through Environmental Design (CPTED) and Retail Crime: Exploring Offender Perspectives on Risk and Protective Factors in the Design and Layout of Retail Environments. In *Retail Crime. Crime Prevention and Security Management*, ed. V. Ceccato and R. Armitage. Basingstoke: Palgrave Macmillan.

Ashby, M.P. 2017. The Value of CCTV Surveillance Cameras as an Investigative Tool: An Empirical Analysis. *European Journal on Criminal Policy and Research* 23 (3): 441–459.

Atlas, R.I. 2013. *21st Century Security and CPTED: Designing for Critical Infrastructure Protection and Crime Prevention*. New York: CRC Press.

Bachman, R.D., and R.K. Schutt. 2016. *Fundamentals of Research in Criminology and Criminal Justice*. Thousand Oaks, CA: Sage Publications.

Beck, Adrian, and Matt Hopkins. 2017. Scan and Rob! Convenience Shopping, Crime Opportunity and Corporate Social Responsibility in a Mobile World. *Security Journal* 30 (4): 1080–1096.

Black, H.C., B.A. Garner, and B.R. McDaniel. 2009. *Black's Law Dictionary*, vol. 126. St. Paul, MN: West Group.

Block, J., et al. 2004. Fast Food, Race and Ethnicity, and Income: A Geographic Analysis. *American Journal of Preventive Medicine* 27 (2004): 211–217.

Boba, Rachel. 2009. *Crime Analysis with Crime Mapping*, 2nd ed. Los Angeles: Sage Publications.

Burns, Stacy Lee. 2008. Demonstrating 'Reasonable Fear' at Trial: Is it Science or Junk Science? *Human Studies* 31: 107–131.

Butler, G. 1994. Shoplifters' Views on Security: Lessons for Crime Prevention. In *Crime at Work: Studies in Security and Crime Prevention*, ed. M. Gill, 56–72. London: Perpetuity Press.

Calder, J.D., and J.R. Bauer. 1992. Convenience Store Robberies: Security Measures and Store Robbery Incidents. *Journal of criminal justice* 20 (6): 553–566.

Calder, J.D., and D.D. Sipes. 1992. Crime, Security and Premises Liability: Toward Precision in Security Expert Testimony. *Security Journal* 3 (2): 1–16.

Ceccato, V., and R. Armitage. 2018. Practical Challenges and New Research Frontiers in Retail Crime and Its Prevention. In *Retail Crime. Crime Prevention and Security Management*, ed. V. Ceccato and R. Armitage. Basingstoke: Palgrave Macmillan.

Chambers, R.W. 1997. Convenience Store Security Standards and Trends. Chapter 13. In *Premises Security and Liability: A Comprehensive Guide from the Experts*, vol. 1, ed. Jurg W. Mattman, Steve Kaufer, and Jean Chaney. Workplace Violence Research Institute: Laguna Beach, CA.

Clarke, R.V. 1999. *Hot Products: Understanding, Anticipating and Reducing Demand for Stolen Goods, Police Research Series Paper 112*. London: Home Office.

Clarke, Ronald, and Gisela Bichler-Robertson. 1998. Place Managers, Slumlords and Crime in Low Rent Apartment Buildings. *Security Journal* 11: 11–19.

Clarke, R., and J. Eck. 2007. *Understanding Risky Facilities*. Washington, DC: U.S. Department of Justice.

Cohen, L.E., and M. Felson. 1979. Social Change and Crime Rate Trends: A Routine Activity Approach. *American Sociological Review* 44: 588–608.

Cook, P. 1985. Is Robbery Becoming More Violent? An Analysis of Robbery Murder Trends Since 1968. *Journal of Criminal Law and Criminology* 76 (1985): 480–489.

Costanza, C.E., W.B. Bankston, and E. Shihadeh. 2001. Alcohol Availability and Violent Crime Rates: A Spatial Analysis. *Journal of Crime and Justice* 24: 71–78.

Cozens, P., and T. Love. 2015. A Review and Current Status of Crime Prevention Through Environmental Design (CPTED). *Journal of Planning Literature* 30 (4): 393–412.

Crow, W., and J. Bull. 1975. *Robbery Deterrence: An Applied Behavioral Science Demonstration*. LaJolla, CA: Western Behavioral Science Institute.

Crowe, T.D., and L.J. Fennelly. 2013. *Crime Prevention Through Environmental Design*. Amsterdam: Elsevier.

D'Addario, F. 1982. *A Curious Confederacy. Security Management* 25 (5): 92–102.

Ditton, J., and E. Short. 1998. When Open Street CCTV Appears to Reduce Crime: Does it Just Get Displaced Elsewhere? *CCTV Today* 5 (2): 13–16.

Duffala, D.C. 1976. Convenience Stores, Armed Robbery, and Physical Environmental Features. *American Behavioral Scientist* 20: 227–246.

Eck, J., R. Clarke, and R. Guerette. 2007. Risky Facilities: Crime Concentration in Homogeneous Sets of Establishments and Facilities. *Crime Prevention Studies* 21 (2007): 225–226.

Eck, J.E., and E.B. Eck. 2012. Crime Place and Pollution. *Criminology and Public Policy.* 11 (2): 281–316.

Ellis, L., K. Beaver, and J. Wright. 2009. *Handbook of Crime Correlates*. Cambridge, MA: Academic Press.

Erickson, Rosemary. 1998. *Convenience Store Security at the Millennium*. Alexandria, VA: National Association of Convenience Stores.

Erickson, R., and S. Lins. 1998. Stores Learn to Inconvenience Robbers: 7-Eleven Shares Many of Its Robbery Deterrent Strategies. *Security Management* 42: 49–53.

Forsyth, Craig J. 2014. The Work of the Sociologist as Mitigation Expert in Cases of Violent Crime. In *Handbook of Forensic Sociology and Psychology*, ed. Stephen J. Morewitz and Mark L. Goldstein, 21–27. New York: Springer.

Gill, M. 2018. The Challenges to Preventing Losses in Retailing: Views from Retail Loss Prevention Managers and Directors. In *Retail Crime: Crime Prevention and Security Management*, ed. V. Ceccato and R. Armitage. Basingstoke: Palgrave Macmillan.

Gill, M., J. Bryan, and J. Allen. 2007. Public Perceptions of CCTV in Residential Areas: It Is Not As Good As We Thought It Would Be. *International Criminal Justice Review* 17 (4): 304–324.

Gill, M., and K. Loveday. 2003. What Do Offenders Think About CCTV? *Crime Prevention and Community Safety: An International Journal* 5 (3): 17–25.

Gill, M., and A. Spriggs. 2005. Assessing the Impact of CCTV. Home Office Research Study No. 292, London, UK.

Gill, M., and V. Turbin. 1998. CCTV and Shop Theft: Towards a Realistic Evaluation. In *Surveillance, Closed Circuit Television, and Social Control*, ed. C. Norris, J. Moran, and G. Armstrong. Brookfield, VT: Ashgate.

Goldstein, P. 1985. The Drug/Violence Nexus: A Tripartite Conceptual Framework. *Journal of Drug Issues* 15 (1985): 493–506.

Gorman, D.M., L. Zhu, and S. Horel. 2005. Drug 'Hot-Spots', Alcohol Availability and Violence. *Drug and Alcohol Review* 24: 507–513.

Gotham, Kevin Fox, and Daniel Bruce Kennedy. 2019. *Practicing Forensic Criminology*. Boston, MA: Academic Press.

Greenberg, S.W., and W.M. Rohe. 1984. Neighborhood Design and Crime: A Test of Two Perspectives. *Journal of the American Planning Association* 49: 48–61.

Gruenewald, P.J., and L. Remer. 2006. Changes in Outlet Densities Affect Violence Rates. *Alcoholism: Clinical and Experimental Research* 30: 1184–1193.

Harrell, Erika. 2011. U.S. Department of Justice Office of Justice Programs Bureau of Justice Statistics. 2011. Workplace Violence, 1993-2009. National Crime Victimization Survey and the Census of Fatal Occupational Injuries. NCJ 233231. Washington, DC: U.S. Department of Justice. www.bjs.govandcontentandpubandpdfandwv09.pdf#9.

Hirsch, M.L., and T.A. Quartaroli. 2011. If It Please the Court: Sociologist as Expert Witness in a Civil Rights Case. *Journal of Applied Social Science* 5 (2): 33–39.

Hollis, M.E. 2019. Security or Surveillance? Examination of CCTV Camera Usage in the 21st Century. *Criminology & Public Policy* 18 (1): 131–134.

Homant, Robert B., and Daniel B. Kennedy. 1997. Foreseeability of Crime as a Factor in Premises Liability for Negligent Security. Chapter 2. In *Premises Security and Liability: A Comprehensive Guide from the Experts*, vol. 1, ed. Jurg W. Mattman, Steve Kaufer, and Jean Chaney, 1–13. Laguna Beach, CA: Workplace Violence Research Institute.

Hsieh, Ching-Chi, and M.D. Pugh. 1993. Poverty, Income Inequality, and Violent Crime: A Meta- Analysis of Recent Aggregate Data Studies. *Criminal Justice Review* 18: 182–202.

Hunter, Ronald D. 1999. Convenience Store Robbery Revisited: A Review of Prevention Results. *Journal of Security Administration.* 22 (1): 1–13.

Hunter, J., L. Garius, P. Hamilton, and A. Wahidin. 2018. Who Steals from Shops, and Why? A Case Study of Prolific Shop Theft Offenders. In *Retail Crime: Crime Prevention and Security Management*, ed. V. Ceccato and R. Armitage. Basingstoke: Palgrave Macmillan.

International Association of Professional Security Consultants (IAPSC). 2014. Forensic Methodology. Alexandria, VA: International Association of Professional Security Consultants (IAPSC).

Jacobs, Bruce A. 2005. When is Crime Foreseeable? For the Defense. June 18–20, 2005. 47(6): 19–20, 57–58.

Jacobs, Bruce A. 2006. Foreseeability and Duty of Care in Third-Party Premises Liability. 35 Brief 54 Winter. 2005–2006.

Jacobs, B.A., and M. Cherbonneau. 2017. Nerve Management and Crime Accomplishment. *Journal of Research in Crime and Delinquency* 54 (2017): 617–638.

Katz, J. 1988. *Seductions of Crime: Moral and Sensual Attractions in Doing Evil*. New York, NY: Basic Books.

Kennedy, Daniel, B. 1991. Inadequate Security and Premises Liability. Trial. June 1991, 56–59.

Kennedy, Daniel B. 2006. Forensic Security and the Law. In *The Handbook of Security*, ed. M. Gill, 118–145. New York: Palgrave Macmillan.

Kennedy, D.B. 2013. Applications of Forensic Sociology and Criminology to Civil Litigation. *Journal of Applied Social Science* 7 (2): 233–247.

Kennedy, Daniel B. 2014. Evolving Practice Parameters of Forensic Criminology. In *Handbook of Forensic Sociology and Psychology*, ed. Stephen J. Morewitz and Mark L. Goldstein, 1–27. New York: Springer.

Kennedy, D., and R. Homant. 1988. Predicting Custodial Suicides: Problems with The Use of Profiles. *Justice Quarterly* 5: 401–416.

Klinger, D.A., and G.S. Bridges. 1997. Measurement Error in Calls-for-Service as an Indicator of Crime. *Criminology* 35 (4): 705–726.

La Vigne, N. 1994. Gasoline Drive-Offs: Designing a Less Convenient Environment. In *Crime Prevention Studies*, vol. 2, ed. R.V. Clarke, 91–114. Monsey, NY: Criminal Justice Press.

Lersch, K. 2004. *Space, Time, and Crime*. Durham, NC: Carolina Academic Press.

Livingston, M. 2008. Alcohol Outlet Density and Assault: A Spatial Analysis. *Addiction* 103: 619–628.

Madensen, T., and J. Eck. 2008. Violence in Bars: Exploring the Impact of Place Manager Decision-Making. *Crime Prevention and Community Safety* 10 (2008): 111–125.

Maruna, S. 2010. *Mixed Method Research in Criminology: Why Not Go Both Ways? In Handbook of Quantitative Criminology*, 123–140. New York: Springer.

Mazerolle, L.G., C. Kadleck, and J. Roehl. 1998. Controlling Drug and Disorder Problems: The Role of Place Managers. *Criminology* 36 (2): 371–404.

Morewitz, Stephen J., and Mark L. Goldstein (eds.). 2014. *Handbook of Forensic Sociology and Psychology*. New York: Springer.

Nasar, J.L. 1981. Environmental Factors and Commercial Burglary. *Journal of Environmental Systems* 11: 49–56.

National Association of Convenience Stores. 1991. *Convenience Store Security Report and Recommendations*. Alexandria, VA: National Association of Convenience Stores.

National Institute of Justice. 2011. What is Translational Criminology? *National Institute of Justice Journal*. Issue 268. https://www.nij.gov/journals/268/Pages/criminology.aspx. Accessed 16 Nov 2019.

National Association of Convenience Stores (NACS). 2017. Scope of the Industry: U.S. Convenience Store Count. www.convenience.organdResearchandFactSheetsandScopeofIndustryandIndustryStoreCount. Accessed 13 Dec 2018).

Noaks, L., and E. Wincup. 2004. *Criminological Research: Understanding Qualitative Methods*. Los Angeles, CA: Sage Publications.

Parker, R.N., and L.A. Rebhun. 1995. *Alcohol and Homicide: A Deadly Combination of Two American Traditions*. Albany, NY: State University of New York (SUNY) Press.

Petherick, W., and C. Ferguson. 2017. Forensic Criminology as a Research Problem: Using Traditional Processes in a Forensic Context. In *Liquid Criminology: Doing Imaginative Criminological Research*, ed. Michael Hviid Jacobsen and Sandra Walklate, 65–78. Abingdon: Routledge (Taylor and Francis Group).

Petherick, Wayne, Claire Ferguson, and Brent Turvey (eds.). 2010. *Forensic Criminology*. Boston, MA: Academic Press.

Piza, E.L., J.M. Caplan, and L.W. Kennedy. 2014a. Analyzing the Influence of Micro-level Factors on CCTV Camera Effect. *Journal of Quantitative Criminology* 30 (2): 237–264.

Piza, E.L., J.M. Caplan, and L.W. Kennedy. 2014b. Is the Punishment more Certain? An Analysis of CCTV Detections and Enforcement. *Justice Quarterly* 31 (6): 1015–1043.

Piza, E.L., B.C. Welsh, D.P. Farrington, and A.L. Thomas. 2019. CCTV Surveillance for Crime Prevention: A 40-Year Systematic Review with Meta-analysis. *Criminology & Public Policy* 18 (1): 135–159.

Pratt, T.C., and F.T. Cullen. 2005. Assessing Macro-Level Predictors and Theories of Crime: A Meta-analysis. *Crime and justice.* 32: 373–450.

Ragin, Charles C. 1994. *Constructing Social Research*. Newbury Park, CA: Pine Forge Press.

Ratcliffe, J., T. Taniguchi, and R. Taylor. 2009. The Crime Reduction Effects of Public CCTV Cameras: A Multi-Method Spatial Approach. *Justice Quarterly* 26 (4): 746–770.

Roncek, D.W., and M.A. Pravatiner. 1989. Additional Evidence that Taverns Enhance Nearby Crime. *Sociology and Social Research* 73: 185–188.

Sampson, Rana. 2004. *Misuse and Abuse of 911*. Washington, D.C.: U.S. Department of Justice.

Sampson, R.J., S.W. Raudenbush, and F. Earls. 1997. Neighborhoods and Violent Crime: A Multilevel Study of Collective Efficacy. *Science* 277 (5328): 918–924.

Savard, D.M., and D.B. Kennedy. 2014. Crime and Security Liability Concerns at Shopping Centers. In *Corporate Security in the 21st Century: Theory and Practice in International Perspective*, ed. K. Walby and R. Lippert, 254–275. New York: Springer.

Savard, Dennis M., and Daniel B. Kennedy. 2017. On the Applications of Forensic Criminology. *Journal of Physical Security* 10 (1): 8–29.

Schlosser, E. 2004. *Fast Food Nation: The Dark Side of the All-American Meal*. New York: Harper.

Scott, M. 2004. *Disorderly Youth in Public Places*. Washington, DC: U.S. Department of Justice.

Sherman, L. 1987. Checking Telephone Calls Can Answer Questions of Liability. *Security* 24 (7): 21–22.

Sherman, L.W., P.R. Gartin, and M.E. Buerger. 1989. Hot Spots of Predatory Crime: Routine Activities and the Criminology of Place. *Criminology* 27 (1): 27–56.

Smith, B.T. 2018. Understanding Shoplifting of Fast-Moving Consumer Goods: An Application of the CRAVED Model. *Security Journal* 31 (2): 428–450.

Smith, B.T., and R.V. Clarke. 2015. Shoplifting of Everyday Products that Serve Illicit Drug Uses. *Journal of Research in Crime and Delinquency* 52 (2): 245–269.

Smith, B.T., and R.V. Clarke. 2018. Can We Ever Know Which Objects Thieves Most Desire? Lessons from Studying Shoplifted Fast-Moving Consumer Goods. In *Retail Crime. Crime Prevention and Security Management*, ed. V. Ceccato and R. Armitage. Basingstoke: Palgrave Macmillan.

Spellman, W. 1995. Once Bitten, Then What: Cross-Sectional and Time-Course Explanations of Repeat Victimization. *British Journal of Criminology* 35 (1995): 366–383.

Strome, S.K., R. Hayes, and K. Grottini. 2018. Situational Determinants of Enhanced Public View Monitor (ePVM) Noticeability in Retail Environments: A Randomized Controlled Trial. *Security Journal* 31 (3): 749–763.

Turvey, B.E. 2013. *Forensic Victimology: Examining Violent Crime Victims in Investigative and Legal Contexts*. Boston, MA: Academic Press.

Vellani, K. 2010. Crime Analysis for Problem Solving Security Professionals in 25 Small Steps. Karim H. Vellani. www.popcenter.organdlibraryandreadingandpdfsandcrimeanalysis25steps.pdf. Accessed 12 Jan 2018.

Vellani, K., and J. Nahoun. 2001. *Applied Crime Analysis*. Boston: Butterworth-Heinemann.

Voigt, L., and W. Thornton. 1996. Sociology and Negligent Security: Premises Liability and Crime Prediction. In *Witnessing for Sociology: Sociology in Court*, ed. Pamela Jenkins and Steve Kroll-Smith, 167–193. Westport: Praeger.

Weiner, I.B., and R.K. Otto (eds.). 2013. *Handbook of Psychology: Forensic Psychology*, vol. 11, 2nd ed, 3–15. Hoboken, NJ: Wiley.

Weisburd, D., S. Amram, and M. Shay. 2018. Shopping Crime at Place: The Case of Tel Aviv-Yafo. In *Retail Crime. Crime Prevention and Security Management*, ed. V. Ceccato and R. Armitage. Basingstoke: Palgrave Macmillan.

Weisburd, D., and L.G. Mazerolle. 2000. Crime and Disorder in Drug Hot Spots: Implications for Theory and Practice in Policing. *Police quarterly* 3 (3): 331–349.

Welsh, Brandon, and L. David Farrington. 2003. Effects of Closed-Circuit Television on Crime. *Annals of the American Academy of Political and Social Science* 587 (2003): 110–135.

White, Garland. 1990. Neighborhood Permeability and Burglary Rates. *Justice Quarterly* 7 (1990): 57–67.

White, M.D., and C.M. Katz. 2013. Policing Convenience Store Crime: Lessons from the Glendale, Arizona Smart Policing Initiative. *Police Quarterly* 16 (3): 305–322.

White, Garland F., and Caitlin V. Muldoon. 2015. Convenience Stores and Routine Activities in a Summer Tourist Destination. *Criminal Justice Studies* 28 (3): 280–296.

Wincup, E. 2017. *Criminological Research: Understanding Qualitative Methods*. Thousand Oaks, CA: Sage Publications.