

Critical Issues and Trends: Culture Change; Health Promoting Community Design

Crime Prevention and Active Living

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INTRODUCTION

The epidemic of obesity in American cities has alarmed public health professionals. Attention has been cast on the importance of leading an active life for good health, so questions have been raised about barriers to active living. One potential barrier is the concern many people have about crime. Is crime a barrier to active living, and if it is, what can be done about it? This paper draws from two fields—environmental criminology and urban planning—to provide evidence of how crime may reduce active living and what can be done to make the physical environment safer.

Environmental criminologists and urban planners start from complementary but different perspectives. Environmental criminologists focus on the development and prevention of crime patterns, particularly the interactions of offenders, potential victims, and others. Their interventions focus on the immediate environments of crime concentrations and manipulate these environments to alter offenders' perceptions of their prospects of success. Planners and urban designers are interested in the legitimate users of the city, who also may become crime victims. They examine how different social groups perceive the public spaces of everyday life, and how these spaces can be modified to encourage desirable activities.

This paper applies both perspectives to explore the relationships among crime, fear of crime, and active living. We begin by describing these relationships to establish a broad research framework. We then look at the factors that influence fear of crime and how they vary among groups and settings. Next we examine the literature on the relationship between physical characteristics of settings, opportunities to commit crimes, and fear of crime. Crime and fear are not

evenly distributed, even over similar places, so this is discussed in the fourth section. In the fifth part we examine criminal justice, the central role of police, and the theoretical perspectives offered by environmental criminology and situational crime prevention. We then turn to the effectiveness of situational crime prevention. We conclude by outlining a research agenda for increasing active living through reducing crime and fear of crime.

THE INFLUENCE OF CRIME ON PHYSICAL ACTIVITY

A complex interplay of promoting and constraining variables affect an individual's decision to walk, bike, or get involved in sports and exercise. Active living is caused by social relationships and the environmental characteristics of settings as well as individual capacities and experiences.¹ One such characteristic is the safety of the spaces that constitute the physical containers of activity—the neighborhood streets and parks, the jogging trails and bike paths. A significant portion of walking, cycling, and physical exercise takes place in public spaces, but if they are crime-ridden or perceived as unsafe people would not want to be there.^{2,3}

A research agenda on the relationship between crime and physical activity should begin with a hypothetical set of relationships. We propose the framework shown in Figure 1. Situational characteristics (factors immediately surrounding a location) create the opportunities for crime and disorder. Crime and disorder produce fear, which in turn reduces physical activity. At the same time, psychological, socio-demographic, and environmental factors influence the fear of crime among individuals and groups. In addition to these relationships, we can also expect several forms of feedback. Crime and disorder can have a direct impact on situational characteristics. Vandalism changes the physical characteristics of places. Fear can also stimulate changes in the situational characteristics, as would happen, for example, when concern about crime stimulates the installation of lighting. Physical activity might alter fear (e.g., if reduction in physical activity creates desolation and induces more fear). Conversely, increased physical activity brings more people to a setting and may reduce fear. The relevance and strength of each of the links shown in Figure 1 depend on the type of physical activity, the type of crime or disorder, and the nature of the particular situations being investigated.

With this framework in mind we pose four basic research questions:

1. Which factors influence fear of crime and disorder among different groups?

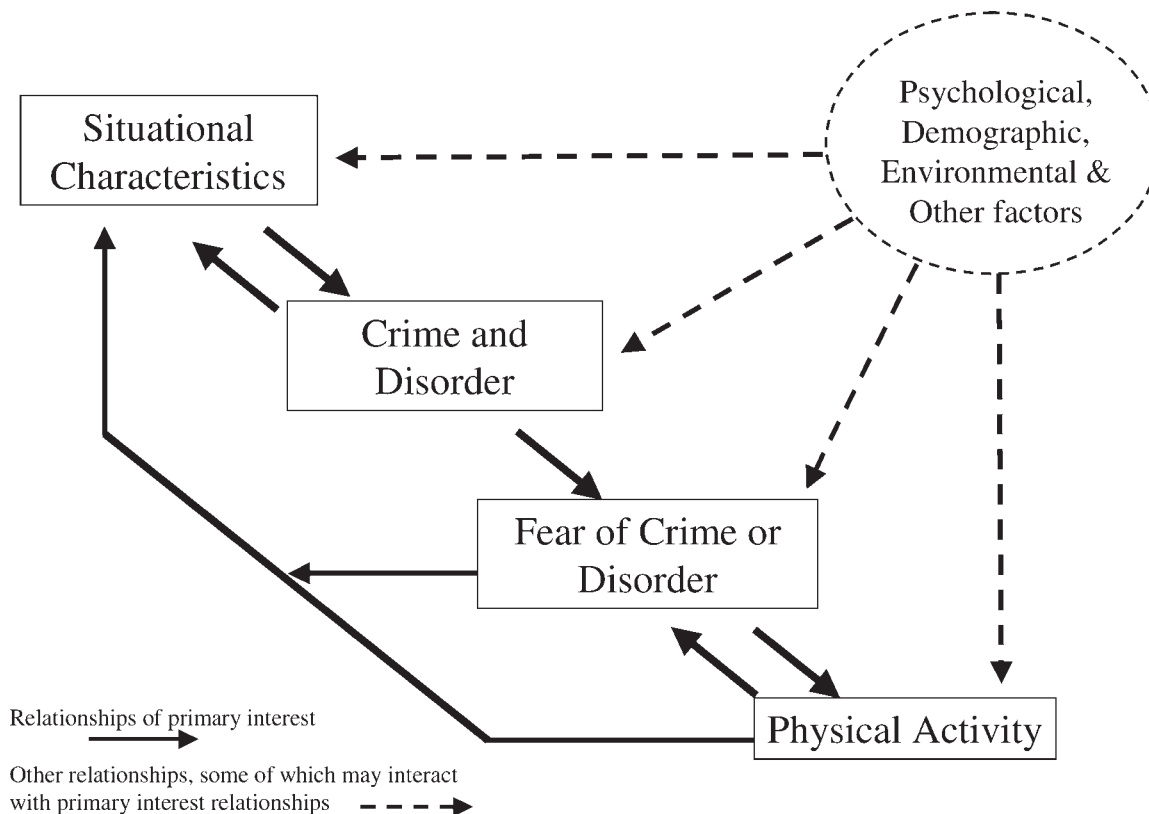
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Figure 1
How Crime May Influence Physical Activity



2. What are the fear-producing physical characteristics of places, and how do these characteristics create opportunities for crime?
3. How are crime and fear of crime distributed among sets of similar places of interest to active living research?
4. What works to reduce fear and crime?

In what follows we first examine the literature to determine preliminary answers to each of the four questions.

WHICH FACTORS INFLUENCE FEAR OF CRIME AND DISORDER AMONG DIFFERENT GROUPS?

Feelings of fear of crime are not described by “mathematical functions of actual risk but are rather highly complex products of each individual’s experiences, memories, and relations to space.”⁴ Psychological factors, such as prior experiences and memories, may influence one’s perception about safety. What we consider “unsafe” may also be influenced by media stories and accounts of others.⁵ In the absence of prior knowledge of a particular setting, judgment is likely to be based on preconceived ideas about similar settings and their occupants.⁶ In particular, a prior experience of victimization almost invariably leads to increased fear and assessment of risk.⁷ Fear may be produced also by parental admonitions, crime prevention classes at schools, and warnings by the police.

At the same time, fear varies significantly by socio-demographic characteristics and can impact diverse sub-populations differently. For example, fear of victimization is more widespread among women than men.^{8,9} This is highly relevant for active living research. The literature on physical activity in women has found that safety issues create barriers to becoming physically active.^{10,11} When income, vehicle ownership, and time constraints are controlled, women are expected to walk less than men because of crime fear. Indeed, in ten focus groups of minority women in California and Missouri, fear of the surroundings was mentioned by all groups as a detriment to exercising or being physically active outdoors.¹²

Women are more likely than men to avoid walking after dark^{13,14} and to drive or take a taxi rather than walk or use public transit because of fear for their safety.¹⁵⁻¹⁷ In some instances, women may completely avoid or confine their use of certain public spaces, or visit them if only accompanied by others. As a result, research has revealed an underrepresentation of women in public spaces.¹⁸⁻²⁰ Specific settings such as multistory parking structures, bus stops and stations, alleys, and underground passages may generate feelings of danger in women.⁶

Safety is a particular concern for minority women. A focus group study of African-American women revealed their belief that they are not provided the same protection to exercise freely in their communities as white women. Many were

reluctant to venture to public spaces for walking or physical activity because of fear for their safety.²¹ Perceived lack of safety was also claimed as a barrier for physical activity in focus group discussions with American Indian and Latina immigrant women.^{22,23}

Studies have, indeed, found more barriers to recreational walking and physical activity, including neighborhoods with high crime rates and fear for personal safety, among ethnic populations.^{24,25} Feelings of insecurity are also affecting the children of ethnic minorities. An assessment of after-school summer activities of children of ethnic minorities found that only 8% participated in nonschool sport programs. Parents cited lack of transportation, unavailability of suitable programs, and unsafe travel as reasons for low participation rates.²⁶

Age also emerges as an important factor that can modify perceptions of risk and fear of crime. While younger people (particularly males) are statistically more at risk for crime than older people, the latter tend to be more fearful. Parental concerns about safety affect children's walking and biking to school, and also their propensity to play outdoors.^{27,28} More than half of the children and adolescents, and more girls than boys, are not sufficiently active.²⁹ The Youth Risk Behavior Surveillance System reported that nationwide 4.4% of students missed at least one day of school during the preceding 30 days because they felt unsafe at school or traveling to school.³⁰

Older adults, for whom walking is the major physical activity, are more influenced by safety/security concerns than other age groups.^{2,31} Concerns about safety may lead older people to avoid specific routes or public spaces,^{32,33} while neighborhood safety and access to local facilities have been found to be important predictors of being active for the elderly.³⁴

Not surprisingly, some studies have shown that the perceived lack of safety is a barrier to recreational walking for low-income individuals,³⁵ who often live in residences with no backyards or adequate space to exercise. A national telephone survey found that twice as many low-income (31%) as moderate-income (15%) respondents identified worry about safety in their neighborhoods as an obstacle to physical activity.³⁶ Lower socioeconomic status is typically found to be associated with unsafe neighborhoods and transient domiciles.²⁴ A survey of Illinois residents found that residents of poor neighborhoods had higher levels of fear of crime and injury in public environments. Nevertheless, and despite their fear, they walked more than residents of affluent neighborhoods out of necessity.¹⁴

Fear of crime appears to be a salient concern for some socio-demographic groups, more than others. However, the relationship between fear of crime and physical inactivity is more tenuous for some groups (e.g., white males, younger people). As a review by Humpel et al. indicates, some researchers find insignificant links between perceived neighborhood safety and neighborhood inactivity, while others observe significant relationships.³⁷ These mixed results can be explained by the methodological inconsistencies that characterize the literature on this topic, which have been described by one of the authors in an earlier article.³

WHAT ARE THE FEAR-PRODUCING PHYSICAL CHARACTERISTICS OF PLACES, AND HOW DO THEY CREATE OPPORTUNITIES FOR CRIME?

The physical characteristics of a setting can affect perceptions of risk there. Since significant portions of walking and cycling take place in neighborhood streets, these activities are greatly influenced by the neighborhood context. Living in neighborhoods with high physical and/or social disorder generates stress and fear. Physical incivilities (e.g., deteriorated or abandoned buildings, litter, graffiti, etc.) or social incivilities (e.g., public drunks, beggars, panhandlers, homeless) produce feelings of risk and fear.³⁸⁻⁴⁰ Conversely, safe, and clean neighborhoods invite outdoor activity.⁴¹ The relationship of incivilities to actual crime is, however, hotly debated.⁴²⁻⁴⁴

People's fear of public spaces often appears to be situated in particular built environments. Two categories of spaces are particularly frightening: (1) enclosed spaces with limited exit opportunities such as multistory parking structures, underground passages, and subway stations; and (2) anonymous and deserted open spaces such as empty parks, forests, recreational areas, and desolate transit stops.⁶ The first are perceived as opportunities for criminals to trap their victims, while the second may allow potential offenders to conceal themselves and act outside the visual range of others. Of course, some boisterous, social places such as bars and gang hangout places can also be particularly scary to some groups. Fear-inducing factors in public environments include darkness, desolation, lack of opportunities for surveillance by the general public, lack of maintenance, and poor environmental quality.¹³ As Day explains, "people fear physical features, such as bushes, low lighting, and dark tunnels. Such features often limit the 'prospect,' or the ability to see into a place where someone may be hiding. Such features may also provide 'refuge' for a criminal to wait for a potential victim... Feared features are often high in 'boundedness' or limits on the ability to escape if danger arises... Feared places typically display some combination of low prospect, high refuge, and high boundedness."⁴⁵ Warr describes three environmental conditions that individuals perceive as "cues to danger": lack of familiarity with an environment, darkness, and the presence of others.⁴⁶ Being alone in a setting can produce stress and fear, but the presence of others can also be threatening, if they are of different race, gender, class, or age. The previous discussion is summarized in Table 1.

While physical features of places can generate feelings of risk and fear, some studies have also shown that crime and the physical environment are related in a systematic, observable, and controllable manner. Studying street crime in Oakland, California, Angel noted that "the physical environment can exert a direct influence on crime settings by delineating territories, reducing or increasing accessibility by the creation or elimination of boundaries and circulation networks, and by facilitating surveillance by the citizenry and the police."⁴⁷

Research on the microenvironment of crime settings has shown that both the possibility of surveillance of a site by bystanders and signs of care that give the appearance that

Table 1
Modifiers of Fear and Perceptions of Risk

Socio-Psychological	Socio-Demographic	Environmental
Experiences and memories	Gender	Geographic setting
Prior victimization	Race/ethnicity	Physical incivilities
Familiarity with setting	Age	Social incivilities
Media stories	Poverty	Boundedness
Admonitions	Disability	Surveillance opportunities
		Lighting level

there are natural guardians who may intervene can discourage potential criminals. In their study of crime in Chicago's rapid transit stations, Block and Davis observed that high levels of guardianship in high-traffic stations had a positive effect on reducing crime incidents.⁴⁸

Studies have shown that certain inherent features of microenvironments affect the likelihood of crime. For example, it is easier for criminals to commit crimes near major streets.⁴⁹ The more escape routes in the vicinity of a site, the easier it is for them to escape.⁵⁰ The surrounding land uses can also affect crime, with certain land uses (e.g., liquor stores, taverns, pawn shops, pool halls, vacant lots, and abandoned buildings) considered to be "crime generators."⁵¹⁻⁵⁵ Similarly, it has been shown that certain urban form and bus stop characteristics influence transit crime. For example, crime rates at Los Angeles bus stops were higher at bus stops near alleys and midblock passages (corroborating the idea that crime is high where there are avenues for escape) and near multifamily housing, liquor stores, check-cashing establishments, vacant buildings, and buildings marked by graffiti and litter. For violent crime, the proximity of bus stops to check-cashing establishments and alleys had the strongest positive correlation with crime rates.⁵⁶ In contrast, some features of the built environment are viewed as having the potential to deter crime.

While the previous findings are indicative of a strong relationship between certain urban form features and opportunities for crime, it needs to be emphasized that these features are not inherently unsafe. It is rather that certain environmental and design qualities of places (e.g., narrowness, darkness, lack of ground floor activities, lack of windows opening up onto a street or public area, etc.) that make them susceptible to crime. Therefore, good design can make a big difference for real and perceived safety. The last section of this paper discusses strategies for safer public spaces.

HOW IS CRIME AND FEAR OF CRIME DISTRIBUTED AMONG PLACES OF INTEREST TO ACTIVE LIVING RESEARCH?

The distribution of crime in places is always heavily skewed. Crime events tend to concentrate in "hot spots," or a relatively limited number of sites.⁵⁷ Consider bus stop crime as an example. About half of all reported bus stop crimes in Los Angeles are committed within a 13-square-mile area that includes downtown and adjacent neighborhoods to the west.⁵⁸ These downtown and inner-city bus lines pass

through some of the most crime-ridden neighborhoods of the city. So it is no surprise that bus stops in these areas are crime-ridden. Still, within the same overall area, even along the same bus line, bus stops have very different crime volumes (Figure 2). If we take ridership data into account and normalize crime incidence per capita, we still find that some bus stops are much more dangerous than others even though they are in close proximity and along the same bus routes. Some bus stops seem to be immune to crime, while others are hot spots of criminal activity. It is clear that environmental attributes around bus stops play major roles in their susceptibility to crime.⁵⁹

Another example can be seen in the distribution of crime in city parks. Typically some parks are more crime-ridden than others. One reason might be size; large urban parks may attract more crime than small neighborhood parks simply because they cover more land and have more features. It turns out, however, that if we control for size, we still find high-risk locations. An illustration of this can be seen in a study of the distribution of crime risk in the city of Chula Vista, California (Figure 3).

It is not clear if feared spaces are indeed the most dangerous spaces. Nevertheless, the loose coupling between fear and actual crime makes this a question we need to answer empirically. It might be the case that a rank ordering of places by crime would look different than a rank ordering of the same places by a fear index. Despite being subjective, however, perceptions have the power to alter individual behavior. Therefore, for active living research, reducing the perception of risk is as important as reducing actual crime and risk. The last part of our paper addresses this issue.

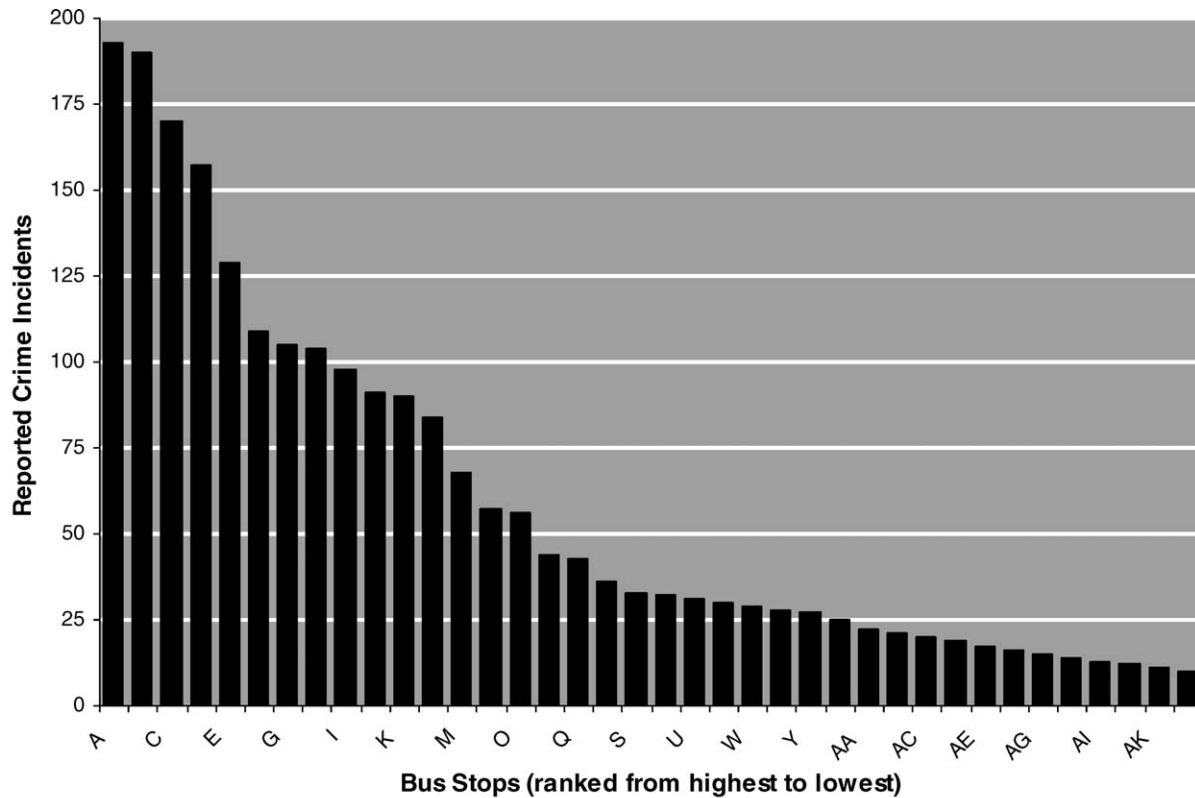
WHAT WORKS TO REDUCE FEAR AND CRIME?

Criminal Justice Systems

Criminal justice systems are some of the first institutions that people turn to when trying to reduce the threat of crime. They are defined by the set of institutions that process offenders to determine what laws have been broken, who is legally responsible, and what should be done with them: police, prosecution, public and private defenders, judges, probation, corrections, parole, and various ancillary institutions dealing with offender treatment and rehabilitation. Criminal justice systems vary by city, county, and state, but all are structured by the criminal legal code.

Some features of criminal justice systems have important implications for active living research. First, criminal justice

Figure 2
Skewed Crime Risk at Los Angeles Bus Stops



Source: Los Angeles County Metropolitan Transportation Authority, data analyzed by the authors

is largely about processing people. The contribution of criminal justice systems to the reduction of crime is chiefly through incapacitation (locking up active offenders so they cannot commit more crimes), deterrence (providing a credible threat to compel obedience to the law), or rehabilitation (applying services designed to convince offenders that they should not violate the law). Each of these strategies is somewhat effective in general, but they are all costly.⁶⁰⁻⁶²

Second, for any given crime, most offenders are not touched by criminal justice systems, and those who are do not tend to penetrate the system very far.⁶³ This implies that the earlier stages of the criminal justice systems are more important for active living than the later stages.

Third, criminal justice systems are not designed to reduce, nor are they capable of reducing, crime in specific situations that could promote active living. The useful impacts of criminal justice systems are spread rather widely, and in the most severely crime-impacted neighborhoods, the utility of relying exclusively on the criminal justice system to produce safety is questionable.

Fourth, the opportunities to commit crime are not addressed by the criminal justice system as a whole. Leaving

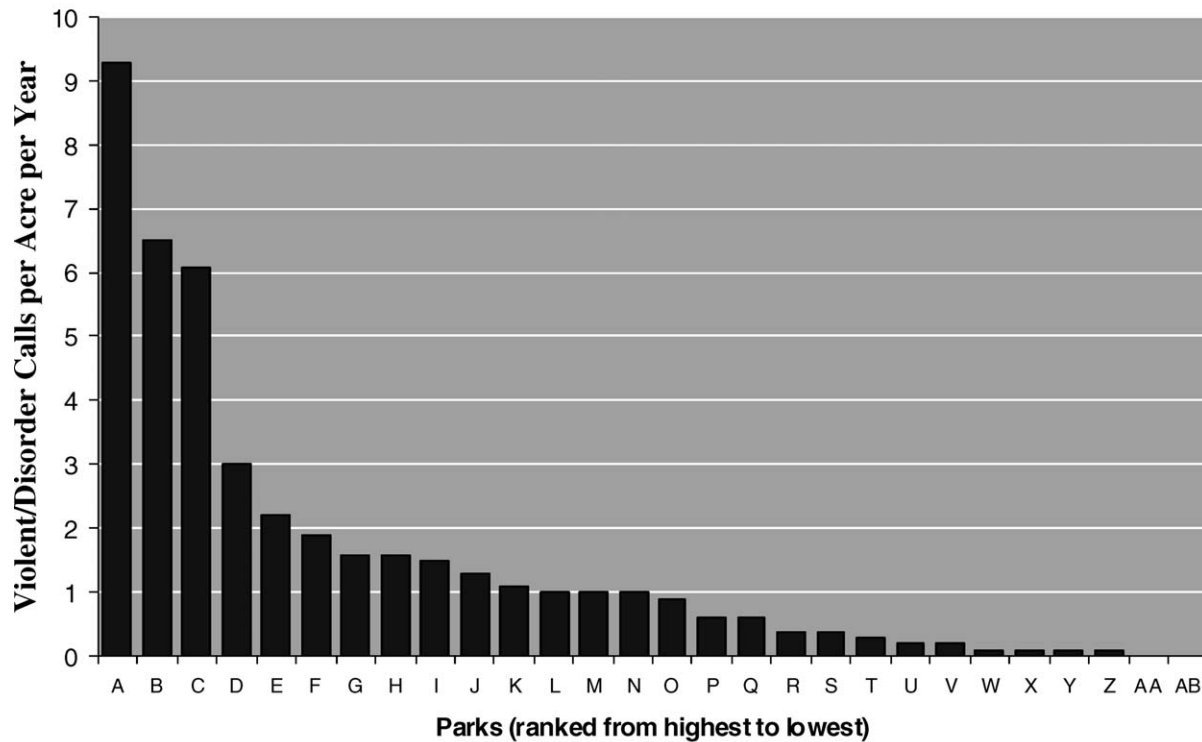
crime opportunities unaddressed simply attracts new offenders, even when old offenders have been removed by a criminal justice strategy. Police are the only part of the criminal justice system that routinely addresses crime opportunities.

Problem-Oriented Policing

Policing is usually much closer to crime problems, and through interventions with communities and other organizations can have large effects on crime. As we will show, the most effective prevention strategies are directed at high-crime locations. There is increasing evidence that benefits from such actions diffuse out to prevent crime at nearby hot spots and the surrounding areas.⁶⁴

Over the last four decades there has been a slow gradual shift in how policing is conducted: from the police as the gatekeepers to criminal justice systems to the idea that police have a broader prevention function. Thus, police and sheriff's departments are viewed as the only local general-purpose agency addressing problems that other institutions and people have failed to address.^{65,66} Crime is the most obvious one.

Figure 3
Skewed Crime Risk in Chula Vista Parks
 (over 2 acres)



Adapted from Stedman, 2005

This broader view of policing, referred to as “problem-oriented policing,”⁶⁷ promotes the systematic analysis of problems to identify potential solutions (often unrelated to law enforcement) and partnerships with other organizations to address these problems. Over the last two decades researchers and practitioners favoring a problem-oriented approach have developed a knowledge base of how to address specific problems. The review of evidence from evaluations of police crime reduction efforts showed that the more focused and the greater the range of actions available, the greater the likelihood that a police strategy reduces crime.⁶⁸ Problem-oriented policing—with its emphasis on systematic analysis, search for the most appropriate solutions, and use of partnerships with other organizations—appears to be the most effective strategy of those examined.⁶⁹

Environmental Criminology

This application of basic scientific principles to crime connects problem-oriented policing to environmental criminology, which explains crime patterns and develops methods for reducing opportunities for committing crimes. Environmental criminology is concerned with how physical and social environments create opportunities for crime; it is comprised of three theoretical perspectives, which are important for active living research because they help

explain the spatial and temporal distributions of crime, and these distributions may impinge on people’s abilities and willingness to engage in active life styles.

The *rational choice* perspective describes how offenders make decisions and the environmental influences that can alter them. Potential offenders make decisions based on their perceptions of five basic criteria: (1) risk: Can I get away with it?; (2) effort: How difficult is it?; (3) reward: What do I get from it?; (4) provocations: Is there a strong prompt to commit it?; and (5) excuses: Can my actions be defended to others? Though offenders may attach different weights to each of these criteria, any given offender will have a greater likelihood of committing a crime the less risk and effort and the more reward, provocations, and excuses involved.^{70,71}

Moving from the offender’s decision to the immediate context of the decision, we enter the realm of *routine activity theory*.⁷² Its core principle is that crimes are highly probable when willing offenders are at accessible places at the same time as desirable targets and effective controllers are unavailable.⁷³ There are three types of controllers. Handlers are people who are emotionally connected to offenders and have an interest in keeping them out of trouble (e.g., parents, coaches, siblings, or spouses). Guardians are people interested in the protection of the target, such as the owner or friend of the target, or someone employed to watch the

target, such as a security guard or a police officer. Place managers are people whose interest is in the smooth functioning of the location. They are often owners of the place or people employed by the owner, such as store clerks, maintenance personnel, lifeguards, and park attendants. Managers control place access and manipulate both the physical and social environments of places.^{74,75}

The third perspective, *crime pattern theory*, describes the contexts of crime places as well as the movement patterns of offenders and targets and their spatial and temporal distribution. Research has shown that the search for crime targets has many of the same characteristics as legitimate shopping. In particular, travel distances from offenders' homes to crime sites follow the same distribution—most crimes are concentrated near home, and the frequency of crime declines rapidly with distance—and most offenders select targets around their normal travel routes.^{76,77} Crime tends to concentrate where offenders and targets are concentrated.

Situational Crime Prevention

While the three perspectives describe the creation of crime events and patterns from the most micro level (individual decision-making) to intermediate levels (place characteristics) and macro levels (neighborhoods, cities, and regions), *situational crime prevention* modifies places and larger areas to reduce opportunities for crime. It asserts that the physical and social characteristics of places and spaces determine offenders' decisions, and suggests that prevention will be more effective if a careful analysis of the microenvironment is undertaken prior to developing a prevention program. While many interventions may seem possible, only a few will fit a particular situation. The primary difference between situational crime prevention and problem-oriented policing is that the first is agnostic as to which institutions should apply this approach.⁷⁸

Situational crime prevention is largely compatible with prevention strategies familiar to planners, particularly defensible space and crime prevention through environmental design (CPTED). Defensible spaces indicate environments displaying environmental characteristics which allow citizens to assume authority for ensuring their safety.⁷⁹ CPTED strategies are environmental design interventions seeking to make places less vulnerable to crime (e.g., adequate lighting, elimination of hiding spots). These strategies are subsets of situational crime prevention, as the latter can be applied to product design, white-collar crime, and other forms of crime that defensible space and CPTED cannot be applied to. There are some differences, however. While situational crime prevention looks at crime opportunities through the eyes of the offender, the other two strategies often take the viewpoints of other actors (e.g., how pedestrians view the safety of walking along a particular street). These differences reflect different perspectives to the same problems. But they may also reflect the difference between attempts to reduce crime and efforts to reduce fear of crime. This raises an important question. Which perspective is most critical to active living research? If situational crime prevention reduces crime but has little influence on fear, and other perspectives influence fear, but have limited impacts on crime, then both

perspectives must be incorporated in active living research dealing with crime, disorder, and fear.

The following case study illustrates the application of situational crime prevention by the Chula Vista Police Department. In this case study, citizens had complained to the police that disorder and drug-related crime in the park inhibited their use of this public space. The police agency partnered with two other city agencies in response to citizen complaints. They discovered that several parks had higher reports of violence and disorder than most parks (see Figure 3). This violence was associated with alcohol use in the park, but regulation of alcohol could not be achieved without authorization by the city council. The analysis also showed that poor lighting and overgrown shrubbery contributed to the problem. Solutions were park-specific and addressed each of the choice criteria of offenders. The package of interventions is summarized in Table 2.

This case illustrates how problem-oriented policing can apply situational crime prevention to enhance active living. Other crime problems impeding active living would require different types of interventions. The important lessons from this case study are not the specific interventions but rather the collaboration among different agencies, analysis to create tailor-made solutions, and application of systematic thinking drawn from situational crime prevention, environmental criminology, and environmental design.

TOWARDS EFFECTIVE PLACE INTERVENTIONS

This example serves to illustrate that many dimensions of the physical environment should be considered in developing appropriate interventions for safer places, such as (1) the characteristics of the population and its relevant needs as well as fears, (2) the characteristics of the setting, and (3) the desired types of activity. While crime prevention is situational and should be tailored to the social and spatial specificities of each neighborhood or setting, we can also offer certain basic principles for effective place interventions at spaces that have the potential to support active living.

First, we need to focus on the worst first—the locations with the most crime or risk of crime. Interventions at low-crime places are usually ineffective for the simple reason that it is very hard to drive crime lower, but also because the low statistical power of studies of places with low base rates makes it difficult to detect the outcomes of small prevention effects.

Second, it is important to conduct a careful analysis of places to locate features that have a large influence on crime or fear of crime: the dark corners, shady underpasses, untrimmed bushes, or graffiti-filled playgrounds. This is at the heart of both situational crime prevention and problem-oriented policing and is probably the single most important explanation for the success of these strategies.

Third, we should apply interventions with evidence of effectiveness whenever possible. A number of syntheses of evidence point to successful and unsuccessful interventions.^{80,81} Police crackdowns at hot spots, for example, show considerable evidence of effectiveness,⁸² but this wears off quickly with time.⁸³ Closed-circuit television and lighting have also been demonstrated to be effective at crime and disorder concentrations.⁸⁴ One of the most powerful inter-

Table 2
Example of Application of Situational Crime Prevention in Chula Vista Parks

Situational Interventions	Intervention at Parks	How It Works
Reducing rewards Remove excuses	Banning alcohol Posting signs	Removes important reason for hanging out—ability to drink with others Legitimacy of public drinking is removed and removal is clearly communicated
Increasing risk Increasing effort	Enforcing alcohol ban Removing cover, changing lighting and other physical changes	Offenders face substantially increased chance of arrest Makes it harder to hide and reduces places suitable for hanging out (also increases risk)
Removing provocations	Enforced ban on alcohol	Removes stimulus for violence among drinkers and reason to litter parks with drink cans and bottles

ventions is the stimulation of place managers to improve regulation of conduct at places.⁸⁰ Importantly, research has consistently shown that place-focused interventions only occasionally shift crime to nearby locations; usually they do not.^{85,86} Nevertheless, there is much more that we do not know about crime prevention effectiveness, and some places of particular concern to active living researchers, such as parks, have not been studied in sufficient detail.

We know far less about effective fear reduction strategies. Nevertheless, there are reasons to believe that the same type of strategies that are effective at reducing crime and disorder can also reduce fear. Crime and disorder contribute to fear, so reducing crime and disorder could also reduce fear. But as an anonymous reviewer suggested, some high-profile, localized crime reduction strategies can also have the paradoxical effect of increasing fear, by undermining the residents' sense of their neighborhood as a safe place.⁸⁷ In such circumstances, outreach efforts to inform the public about the declines in crime and disorder are required to assure that fears abate. One of the earliest problem-oriented policing efforts was specifically designed to reduce fear,⁸⁸ and the evaluation of this effort showed success at obtaining this objective, as well as crime and disorder reduction.⁸⁹

HOW SHOULD ACTIVE LIVING CRIME PREVENTION RESEARCH PROCEED?

We began this paper describing in Figure 1 how active living is related to crime, fear of crime, and other factors. We will close by using Figure 1 to help summarize our findings and make recommendations for future research.

Situational Characteristics and Crime/Disorder

Environmental criminology provides robust theoretical perspectives for understanding the relationship between the environment (built and social) and misbehavior (crime and disorder). These perspectives complement urban planning and environmental design theories. Together, these fields have amassed a strong body of research showing that crime and disorder are outcomes of individual actions in environmental contexts. As active living research is interested in particular environments, additional research is needed to specify how such salient environments as parks, pedestrian routes, trails, recreational facilities, and similar places influence crime. Additionally, we need to look carefully at how psychological and demographic characteristics of

potential place users influence these relationships (e.g., whether the relative composition of males and females influences disorder in parks and whether this varies by type of park). We should also examine how crime and disorder influence situational characteristics (i.e., we cannot assume one-way causation, from environment to crime).

Crime/Disorder and Fear

There is considerable research examining the link between crime/disorder and fear. Much of it details the differing reactions by socio-demographic variables. Nevertheless, much work needs to be done to specify the way crime effects fear. Particularly, how much and what types of crime have the greatest impact on fear? How rapidly does fear increase with increases in crime or disorder, and what is the functional form (i.e., does fear rise linearly or in accordance with some nonlinear response function)? There are important policy implications here. If fear is hyperresponsive to crime, then small fluctuations in crime will have big impacts on fear. But if fear is only slightly sensitive to crime, then small crime fluctuations are not critical impediments to active living. We also know very little about how fear might abate following declines in crime. How long does it take for people to notice increased safety, and what is the minimal crime reduction needed to spark a significant reduction in fear? We would expect answers to these questions to vary by environment, demographic, and psychological factors.

Fear and Physical Activity

The literature shows that fear of crime is salient for active living, but the link between fear and physical activity needs to be further clarified. We know little about (1) how much fear is required to limit physical activity, (2) how fast fear alters physical activity, or (3) how rapidly physical activity recovers following fear reduction. If people adopt sedentary habits once fearful of using a place, these habits may be hard to break. If so, then preventing fear becomes critical, as rehabilitating a place in the minds of the public will be difficult.

Physical Activity and Situational Characteristics

Though theories suggest that physical activity might improve situational characteristics of places, thus making them less crime-prone, the research on this feedback process is primarily cross-sectional and nonexperimental, so we must be cautious when drawing conclusions. Active living may not

be simply the outcome of a series of relationships, but an important part of this process. Research on physical activity as a variable that changes the environment, and thus influences crime and disorder, would further demonstrate the importance of active living for creating and maintaining a dynamic and healthy society.

This research agenda is based on the idea that the relationship between crime and physical activity may be dynamic. If crime influences physical activity and physical activity influences crime, it will be important to examine these relationships over time rather than rely solely on cross-sectional studies. Further, we cannot assume that there are common and quickly reached equilibriums, stable levels of physical activity or crime that become established soon after a change. Indeed, we will want to determine if such equilibriums exist, and under what circumstances. Conducting research to answer such questions is extremely difficult with standard research tools. Recently, however, computer simulations have been applied to urban systems.⁹⁰ Simulations allow us to determine the behavior of the system. For example, we would want to know whether reducing crime in a park creates a stable situation that increases park use for a long time or whether crime, fear, and use fluctuate in a chaotic pattern. Simulations can also help show whether small changes in crime can precipitate large-scale changes in physical activity. This has implications in both directions. Do we need to be attentive to very small increases in crime to prevent catastrophic reductions in physical activity, or is physical activity immune to all but the largest changes in crime? Can we achieve large increases of physical activity by modest reductions in crime or fear of crime, or do we have to create virtually crime free areas first? Such questions provide fertile ground for future research.

References

1. Transportation Research Board. *Special Report 282: Does the Built Environment Influence Physical Activity? Examining the Evidence*. Washington, DC: Transportation Research Board, Committee on Physical Activity, Health, Transportation, and Land Use; 2005.
2. Center for Disease Control and Prevention. Neighborhood safety and the prevalence of physical activity—selected states, 1996. *MMWR Morb Mortal Wkly Rep*. 1999;47:143–146.
3. Loukaitou-Sideris A. Is it safe to walk? Neighborhood safety and security considerations and their effects on walking. *J Plan Lit*. 2006;20:219–232.
4. Koskela H. Bold walk and breakings: women's spatial confidence versus fear of violence. *Gender, Place, and Culture*. 1997;4:304.
5. Koskela H, Pain R. Revisiting fear and place: women's fear of attack and the built environment. *Geoforum*. 2000;31:269–280.
6. Valentine G. Women's fear and the design of public space. *Built Environ*. 1990;16:288–303.
7. Ferraro K. *Fear of Crime: Interpreting Victimization Risk*. Albany, NY: State University of New York Press; 1995.
8. Gordon M, Riger S. *The Female Fear*. New York, NY: The Free Press; 1989.
9. Day K. Constructing masculinity and women's fear in public space in Irvine, California. *Gender, Place, and Culture*. 2001;8:109–127.
10. King AC, Castro C, Wilcox S, et al. Personal and environmental factors associated with physical inactivity among different racial-ethnic groups of U.S. middle-aged and older-aged women. *Health Psychol*. 2000;19:354–364.
11. Johnson CA, Corrigan SA, Dubbert PM, Gramling SE. Perceived barriers to exercise and weight control practices in community women. *Women Health*. 1990;16:177–191.
12. Eyster AA, Baker E, Cromer L, et al. Physical activity and minority women: a qualitative study. *Health Educ Behav*. 1998;25:640–652.
13. Atkins S. *Critical Paths: Designing for Secure Travel*. London, UK: Design Council; 1989.
14. Ross CE. Walking, exercising, and smoking: does neighborhood matter? *Soc Sci Med*. 2000;51:265–274.
15. Stanko E. *Everyday Violence: Women's and Men's Experience of Personal Danger*. London, UK: Pandora; 1990.
16. Wekerle G, Whitzman C. *Safe Cities: Guidelines for Planning, Design and Management*. New York, NY: Van Nostrand Reinhold; 1995.
17. Lynch G, Atkins S. The influence of personal security fears on women's travel patterns. *Transportation*. 1988;15:255–277.
18. Cranz G. Women in urban parks. *Journal of Women in Culture and Society*. 1980;5:79–95.
19. Cooper Marcus C, Francis C, eds. *People Places: Design Guidelines for Urban Open Space*. New York, NY: Van Nostrand Reinhold; 1990.
20. Loukaitou-Sideris A. Urban form and social context: cultural differentiation in the uses of neighborhood parks. *J Plan Educ Res*. 1995;14:89–102.
21. Wilbur J, Chandler P, Dancy B, et al. Environmental, policy, and cultural factors related to physical activity in urban, African-American women. *Women Health*. 2002;36:17–28.
22. Thompson JL, Allen P, Cunningham-Sabo L, et al. Environmental, policy, and cultural factors related to physical activity in sedentary American Indian women. *Women Health*. 2002;36:59–74.
23. Evenson KR, Sarmiento OL, Macon ML, et al. Environmental, policy, and cultural factors related to physical activity among Latina immigrants. *Women Health*. 2002;36:43–57.
24. Seefeldt V, Malina RM, Clark MA. Factors affecting levels of physical activity in adults. *Sports Med*. 2002;32:143–168.
25. Amesty SC. Barriers to physical activity in the Hispanic community. *J Public Health Policy*. 2003;24:41–58.
26. Seefeldt V, ed. *Recreating Recreation and Sports in Detroit, Hamtramck and Highland Park: Final Report to the Skillman Foundation*. Detroit, Mich: The Skillman Foundation; 1995.
27. Transportation Research Board. *Special Report 269: The Relative Risks to School Travel*. Washington, DC: Transportation Research Board. 2002.
28. Valentine G, McKendrick JH. Children's outdoor play: exploring parental concerns about children's safety and changing nature of childhood. *Geoforum*. 1997;28:219–235.
29. King AC, Rejeski WJ, Buchner DM. Physical activity interventions targeting older adults. A critical review and recommendations. *Am J Prev Med*. 1998;15:316–333.
30. Kann L, Warren CW, Harris WJ. Youth risk behavior surveillance—United States, 1993. *MMWR Surveill Summ*. 1995;44(SS-1):1–55.
31. Organization for Economic Cooperation and Development. *Safety of Vulnerable Road Users (DSTI/DOT/RTR/RS7(98)1FINAL)*. Paris, France: Directorate for Science, Technology, and Industry, Scientific Expert Group on the Safety of Vulnerable Road Users; 1998.
32. Brownson RC, Houseman RA, Brown DR, et al. Promoting physical activity in rural communities. *Am J Prev Med*. 2000;18:235–241.
33. Troped PJ, Saunders RP, Pate RR, et al. Associations between self-reported and objective physical environmental factors and use of a community rail-trail. *Prev Med*. 2001;32:191–200.
34. Booth ML, Owen N, Bauman A, et al. Social-cognitive and perceived environmental influences associated with physical activity in older Australians. *Prev Med*. 2000;31:15–22.
35. Craig CL, Brownson RC, Cragg SE, Dunn AL. Exploring the effect of the environment on physical activity: a study examining walking to work. *Am J Prev Med*. 2002;23(2S):36–43.
36. Moore BJ, Glick N, Romanowski B, Quinley H. Neighborhood safety, child care, and high costs of fruit and vegetables identified as barriers to increased activity and healthy eating and linked to overweight and income [abstract]. *FASEB J*. 1996;10:A562.
37. Humpel N, Owen N, Leslie E. Environmental factors associated with adults' participation in physical activity. *Am J Prev Med*. 2002;22:188–199.
38. Taylor RB, Gottfredson SD, Brower S, Block S. Crime and fear: defensible space, local social ties, and territorial functioning. *J Res Crime Delinq*. 1984;21:303–331.
39. Skogan WG. *Disorder and Decline: Crime and the Spiral Decay in American Neighborhoods*. New York, NY: MacMillan; 1990.

40. Perkins DD, Abraham A, Richard R, Taylor RB. The physical environment of street crime. *J Environ Psychol*. 1993;13:29–49.
41. LaGrange R, Ferraro K, Supancic M. Perceived risk and fear of crime: role of social and physical incivilities. *J Res Crime Delinq*. 1992; 29:311–334.
42. Wilson JQ, Kelling GL. Broken windows: the police and neighborhood safety. *Atlantic Monthly*. 1982;249(3):29–38.
43. Harcourt BE. *Illusion of Order: The False Promise of Broken Windows Policing*. Cambridge, Mass: Harvard University Press; 2001.
44. Taylor R. *Breaking Away from Broken Windows: Baltimore Neighborhoods and the Nationwide Fight Against Crime, Crime, Fear, and Decline*. Boulder, Colo: Westview Press; 2001.
45. Day K. Fear of crime and the physical environment. In: Zelinka A, Brennan D. *Safescape: Creating Safer, More Livable Communities Through Planning and Design*. Washington, DC: American Planning Association Planners Press; 2001:7.
46. Warr M. Dangerous situations: social context and fear of victimization. *Soc Forces*. 1990;68:891–907.
47. Angel S. *Discouraging Crime Through City Planning*. Berkeley, Calif: Center for Planning and Development Research; 1968.
48. Block R, Davis S. The environs of rapid transit stations: a focus for street crime or just another risky place? In: Clarke D, ed. *Preventing Mass Transit Crime*. Monsey, NY: Criminal Justice Press; 1996: 238–257.
49. Brantingham PL, Brantingham PJ. Nodes, paths, and edges: considerations on the complexity of crime and physical environment. *J Environ Psychol*. 1993;13:3–28.
50. Poyner B. *Design Against Crime*. London, UK: Butterworth; 1983.
51. Byrne J. Cities, citizens, and crime: the ecological/non-ecological debate reconsidered. In: Byrne J, Sampson RJ, eds. *The Social Ecology of Crime*. New York, NY: Springer Verlag; 1986:77–101.
52. Greenberg S. Fear and its relationship to crime, neighborhood deterioration and informal social control. In: Byrne J, Sampson RJ, eds. *The Social Ecology of Crime*. New York, NY: Springer Verlag; 1986:47–62.
53. Roncek DW, Maier PA. Bars, blocks and crimes revisited: linking the theory of routine activities to the empiricism of ‘hot spots.’ *Criminology*. 1991;29:725–753.
54. Spelman W. Abandoned buildings: magnets for crime. *J Crim Just*. 1993;21:481–495.
55. Block RL, Block CR. Space, place, and crime: hot spot areas and hot places of liquor-related crime. In: Eck J, Weisburd D, eds. *Crime and Place*. Monsey, NY: Willow Tree Press; 1995.
56. Loukaitou-Sideris A, Liggett R, Iseki H. Measuring the effects of built environment on bus stop crime. *Environ Plann B*. 2001;28:255–280.
57. Eck JE, Clarke RV, Guerette RT. Risky facilities: crime concentration in homogeneous sets of establishments and facilities. In: Farrell G, Bowers KJ, Johnson SD, Townsley M, eds. *Imagination for Crime Prevention*. Monsey, NY: Criminal Justice Press. In press.
58. Loukaitou-Sideris A. Hot spots of bus stop crime: the importance of environmental attributes. *J Am Plann Assoc*. 1999;65:395–411.
59. Loukaitou-Sideris A, Liggett R. On bus stop crime. *Access*. 2000; 16:27–33.
60. Cullen FT, Sundt JL. Reaffirming evidence-based corrections. *Criminology and Public Policy*. 2003;2:353–358.
61. Spelman W. The limited importance of prison expansion. In: Blumstein A, Wallman J, eds. *The Crime Drop in America*. Cambridge, UK: Cambridge University Press; 2000:97–129.
62. Wright BRE, Caspi A, Moffitt TE, Paternoster R. Does the perceived risk of punishment deter criminally prone individuals? Rational choice, self-control, and crime. *J Res Crime Delinq*. 2004;41:180–213.
63. Ruth H, Reitz KR. *The Challenge of Crime: Rethinking Our Response*. Cambridge, Mass: Harvard University Press; 2003.
64. Clarke RV, Weisburd D. Diffusion of crime control benefits: observations on the reverse of displacement. In: Clarke RV, ed. *Crime Prevention Studies*. Monsey, NY: Criminal Justice Press; 1994:165–184.
65. Goldstein H. Improving policing: a problem-oriented approach. *Crime Delinquency*. 1979;25:236–258.
66. Scott MS. Policing for prevention: shifting and sharing the responsibility to address public safety problems. In: Tilley N, ed. *Crime Prevention Handbook*. Cullompton, Devon: Willan; 2005.
67. Goldstein H. *Problem-Oriented Policing*. New York, NY: McGraw-Hill; 1990.
68. Weisburd D, Eck JE. What can police do to reduce crime, disorder and fear? *Ann Am Acad Polit SS*. 2004;593(May):42–65.
69. National Research Council. *Fairness and Effectiveness in Policing: The Evidence*. Washington, DC: National Academies Press; 2004.
70. Clarke RV, Eck JE. *Crime Analysis for Problem Solvers: In 60 Small Steps*. Washington, DC: Office of Community Oriented Policing; 2005.
71. Cornish DB, Clarke RV. Opportunities, precipitators and criminal decisions: a reply to Wortley’s critique of situation crime prevention. In: Smith MJ, Cornish DB, eds. *Theory for Practice in Situational Crime Prevention*. Monsey, NY: Criminal Justice Press; 2003:41–96.
72. Cohen L, Felson M. Social change and crime rate trends: a routine activity approach. *Am Sociol Rev*. 1979;44:588–605.
73. Felson M. *Crime and Everyday Life*. 3rd ed. Thousand Oaks, Calif: Sage; 2002.
74. Eck JE. Police problems: the complexity of problem theory, research and evaluation. In: Knutsson J, ed. *Problem-Oriented Policing: From Innovation to Mainstream*. Monsey, NY: Criminal Justice Press; 2003:67–102.
75. Felson M. Those who discourage crime. In: Eck JE, Weisburd D, eds. *Crime and Place*. Monsey, NY: Criminal Justice Press; 1995:53–66.
76. Brantingham PL, Brantingham PJ. Environment, routine, and situation: toward a pattern theory of crime. In: Clarke RV, Felson M, eds. *Routine Activity and Rational Choice*. New Brunswick, NJ: Transaction; 1993:259–294.
77. Rengert GF. The journey to crime. In: Bruinsma G, Elffers H, Keijser JD, eds. *Punishment, Places and Perpetrators: Developments in Criminology and Criminal Justice Research*. Cullompton, Devon: Willan; 2004: 169–181.
78. Clarke RV. *Situational Crime Prevention: Successful Case Studies*. 2nd ed. Albany, NY: Harrow and Heston; 1997.
79. Newman O. *Defensible Space: Crime Prevention Through Environmental Design*. New York, NY: MacMillan; 1972.
80. Eck JE. Preventing crime at places. In: Sherman LW, Farrington D, Welsh B, MacKenzie DL, eds. *Evidence-Based Crime Prevention*. New York, NY: Routledge; 2002:241–294.
81. Poyner B. What works in crime prevention: an overview of evaluations. In: Clarke RV, ed. *Crime Prevention Studies*. Monsey, NY: Criminal Justice Press; 1993:7–34.
82. Braga AA. The effects of hot spots policing on crime. *Ann Am Acad Polit SS*. 2001;578(November):104–125.
83. Sherman LW. Police crackdowns: initial and residual deterrence. In: Tonry M, Morris N, eds. *Crime and Justice: A Review of Research*. Chicago, Ill: University of Chicago Press; 1990:1–48.
84. Welsh BC, Farrington DP. Surveillance for crime prevention in public space: results and policy choices in Britain and America. *Criminology and Public Policy*. 2004;3:497–526.
85. Hesselting RBP. Displacement: a review of the empirical literature. In: Clarke RV, ed. *Crime Prevention Studies*. Monsey, NY: Criminal Justice Press; 1994:197–230.
86. Weisburd D, Wyckoff LA, Ready J, et al. Does crime just move around the corner? A controlled study of displacement and diffusion in two crime hot spots. *Criminology*. In press.
87. Brindinball B, Jesilow P. Weeding criminals or planting fear: the evaluation of a weed and seed project. *Crim Justice Rev*. 2005; 30:64–89.
88. Taft PBJ. *Fighting Fear: The Baltimore County C.O.P.E. Project*. Washington, DC: Police Executive Research Forum; 1986.
89. Cordner GW. Fear of crime and the police: an evaluation of a fear-reduction strategy. *J Police Sci Admin*. 1986;14:223–233.
90. Batty M. *Cities and Complexity: Understanding Cities with Cellular Automata, Agent-Based Models, and Fractals*. Cambridge, Mass: MIT Press; 2005.