CHAPTER ONE

Injury Prevention and Behavior

An Evolving Field

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Despite substantial gains in reducing some types of unintentional and violent injuries, these remain the leading cause of death from ages one to forty-four in the United States (Centers for Disease Control and Prevention, 2005). In fact, injuries are an increasing burden globally, with motor vehicle crashes projected to move from being the ninth leading cause of death in the world in 1990 to becoming the third leading cause of death by the year 2020 (Peden et al., 2004). Ironically, this projection comes at a time when we know more about effective prevention strategies than ever before. For example, the protective effect of seat belts, child auto restraint devices and bicycle helmets is irrefutable (National Highway Traffic Safety Administration, 2004; National Safe Kids Campaign, 2003; Marshall et al., 1998; Doll, Mercy, Bonzo, & Sleet, 2006). For these interventions, the challenge is to increase dissemination and adoption of preventive behaviors and practices. For other interventions less well researched, the challenges are in developing and testing promising interventions. In either case, the benefit of using, adapting, or applying behavior change theory, principles, and methods is clear.

There are numerous products, practices, and programs that can save lives, but many people have either not heard about them or have not accepted and

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adopted them. Many people do not see the need to change, do not perceive themselves to be at risk, or do not have access to affordable safety products or programs that could save their lives. Behavioral scientists can help remedy this situation.

In other cases, product or environmental redesign or new laws and regulations could benefit safety. For example, playgrounds could be designed in such a way as to reduce injury risk behaviors or minimize injury in a fall. Hazardous equipment at workplaces could be designed to minimize workers' unsafe behaviors and the likelihood of dangerous man-machine interactions. Here, roles for behavioral scientists include helping others to understand how to influence employers, city planners, product designers, and decision makers who have the authority to change the culture of safety. Studying the interaction among environments, products, and human behavior is an important role for behavioral scientists, as is facilitating the dissemination and adoption of best practices. Health psychology as a discipline has been slow to recognize this role in injury prevention, but this situation is improving (Spielberger & Frank, 1992; Sleet, Hammond, Jones, Thomas, & Whitt, 2004).

Just as behavioral scientists have made significant contributions to the prevention and control of other health-related behaviors (for example, human immunodeficiency virus and sexually transmitted diseases, asthma, overeating, smoking, and drug use), there are new opportunities to use their tools, skills, and concepts to address the problem of injuries. As DiLillo, Peterson, and Farmer (2002) point out, "More people are beginning to recognize that, for injury control to be effective, behavior must change among some groups, such as children, parents, legislators, manufacturers, and educators. . . . Furthermore, many of the constructs with which psychologists are most conversant (e.g. motivation, perception, learning) are thought by many to be the key determinants of injury-related behaviors" (p. 565).

In this chapter, we trace the development of injury prevention as a field and highlight the evolving role of behavior change. We start with a description of the magnitude of the injury problem in the United States, followed by a brief introduction to the principles of injury prevention. We conclude with a discussion and examples of behavior change that could reduce the toll of injuries.

The Injury Problem

Whether by violent or unintentional means, injury exacts a large toll on individuals, families, workplaces, and the community. Despite the presence of many effective interventions, there were more than 160,000 injury-related fatalities in the United States in 2002 (Centers for Disease Control and Prevention, 2005). In addition, in 2003, there were almost 30 million nonfatal incidents requiring emer-

gency department care (Centers for Disease Control and Prevention, 2005). In too many of these situations, effective interventions existed but were not available to or not used by practitioners or other end users.

Because injuries and violence disproportionately affect the young, their impact on years of potential life lost (YPLLs) is great. By the year 2020, motor vehicle crashes are projected globally to rank second behind ischemic heart disease in YPLLs, ahead of cerebrovascular disease, cancer, and HIV. Violence and suicide rank eleventh and thirteenth, respectively. Disability-adjusted life-years (DALYs), a measure of the population burden of nonfatal injuries, projected for the year 2020, indicate that motor vehicle crashes, violence, and self-inflicted injuries will be in the top fifteen causes of DALYs (Murray & Lopez, 1996).

In the United States, unintentional injuries represent the first leading cause of death for individuals ages one to thirty-four and the fifth leading cause of death overall. Homicide and suicide figure prominently as well and, when they are combined with unintentional injuries, make injuries the leading cause of death for ages one to forty-four (Centers for Disease Control and Prevention, 2005). Years of potential life lost are greater for injuries than for any of the other leading causes of death in the United States.

Injury rates vary by geography, individual characteristics, and type of injury. For example, Fingerhut and Warner's analyses of U.S. data (1997) found the following:

- Unintentional injury death rates were higher in nonmetropolitan counties than in metropolitan counties, whereas the opposite was true for homicide rates.
- Injury death rates were higher for males than females in all age groups except infancy.
- Of violent crimes reported in the National Crime Victimization Survey, 43 percent were crimes against women, and women are more likely than men to be victimized by an intimate partner.
- For infants and children under age fifteen, motor vehicles, fires and burns, drowning, suffocation, and firearms accounted for 80 percent of all injury deaths.
- For males ages fifteen to twenty-four, the firearm death rate was 32 percent higher than the motor vehicle injury death rate.
- Among those over the age of seventy-five, three out of five injury hospitalizations were due to fractures, half of which were hip fractures, and for those over age eighty-five, falls caused one-third of all injury deaths.

A complete discussion of injury epidemiology is beyond the scope of this chapter. Interested readers are referred to existing textbooks (Barss, Smith, Baker, &

Mohan, 1998; Baker, O'Neill, Ginsburg, & Li, 1992; Robertson, 1992; Christoffel & Gallagher, 1999; McClure, Stevenson, & McEvoy, 2004) and national databases available online (Centers for Disease Control and Prevention, 2005; National Center for Health Statistics, 2005). (See Appendix this volume.)

The development of modern injury prevention is typically credited to the work of William Haddon (a physician and engineer) who, beginning in the late 1960s, pulled together efforts of Hugh DeHaven (a physiology researcher), John Gordon (an epidemiologist), and James Gibson (an experimental psychologist) and refined the definitional and conceptual issues related to injury (Christoffel & Gallagher, 1999). Injuries are defined as "any unintentional or intentional damage to the body resulting from acute exposure to thermal, mechanical, electrical, or chemical energy or from the absence of such essentials as heat or oxygen" (National Committee for Injury Prevention and Control, 1989, p. 4). Of these, mechanical or kinetic energy contributes the most to injuries and is a concept that the public and professionals in the field need to understand. The impact on the human body of kinetic energy that results from any number of events (falling, crashing a car, or being shot, for example) will be a function of the mass and velocity involved. Understanding the basics of this concept will help the new mother understand why holding her baby in her lap in a car is a dangerous idea. In a 35 mile per hour crash into a rigid object, a twenty-pound baby will travel with a force of as much as eight hundred pounds and would be ripped out of anyone's arms (Christoffel & Gallagher, 1999). The goal of vehicle crush zones, air bags, seat belts, and car seats is to reduce the impact of the crash on the human body by absorbing some of the energy from the crash, slowing the transfer of energy over a longer period of time, and distributing the crash forces over a larger area of the body (Barss et al., 1998). According to Stevenson, Ameratunga, and McClure (2004, p. 37), "The conceptualization of energy as the causal agent has been acclaimed as the essential explanation for the dramatic success of injury control over the last 40 years."

Injury Prevention

Injury prevention opportunities have historically been conceptualized in three ways: Haddon matrix and countermeasures, passive versus active strategies, and the three E's (education, ergonomics, and enforcement).

Haddon Matrix and Countermeasures

The Haddon Matrix classifies injury by phases and factors, as described here. First, Haddon identified three phases of the injury problem (Barss et al., 1998; see also Chapter Seven, this volume):

Pre-event: Before the crash (or other injury event). What affects the likelihood that it will occur?

Event: During the crash (or other injury event). What affects the likelihood that someone will be injured?

Postevent: After the crash (or other injury event). What affects the outcomes once an injury has occurred?

Second, each of these has host, agent and vehicle, and environmental factors that are relevant to the injury and offer many opportunities for prevention.

Haddon (Haddon & Baker, 1981) then identified ten countermeasures that would prevent or interrupt the transfer of energy:

- Eliminating the production of the hazard
- Reducing the amount of energy contained in the hazard
- Preventing the release of the hazard
- Modifying the rate or spatial distribution of the hazard
- Separating the hazard in time or space from those to be protected
- Separating the hazard from those to be protected by a material barrier
- Modifying the relevant basic qualities of the hazard
- Making individuals more resistant to the hazard
- Countering the damage already done by the hazard
- Stabilizing, repairing, and rehabilitating the individual damaged

These countermeasures do not link specifically to the different phases of the Haddon matrix, although there are countermeasures appropriate for each cell. For example, four-sided pool fencing would separate people from the hazard and thus work at the pre-event phase by modifying the physical environment. Of course, simply installing a four-sided fence (modifying the environment) is not the complete solution. To ensure the fence keeps out unauthorized visitors, it must be of sufficient height to ward off climbers, and the gate to the fence must be self-closing and self-latching. Even environmental countermeasures must account for behavioral interactions that might negate or reduce their effectiveness.

Passive Versus Active Strategies

Passive strategies are those that require no action on the part of the individual being protected (for example, shatter-resistant windshields), whereas active strategies require some individual action (for example, buckling a seat belt; Haddon & Baker, 1981). Passive strategies have consistently been given preference in developing injury prevention programs, largely due to their remarkable success in other

areas of public health (for example, water fluoridation or vaccination) However, even air bags, once hailed as the penultimate passive strategy, require the concomitant use of active strategies: buckling the seat belt and seating children in the rear of the vehicle (Sleet, 1984; Gielen & Sleet, 2003). While passive strategies are still preferred for their obvious appeal, many require some active behavioral interaction (Gielen & Sleet, 2003; Sleet & Gielen, 2004). For example, the passive strategy of child-resistant caps on medicines requires caregivers to replace the caps; smoke alarm batteries must be changed; factory-set hot water heater temperatures must not be manually raised. Although passive, all of these intervention strategies require some human interaction to achieve their full safety potential.

The Three E's

The original concepts behind the three E's (education, ergonomics, and enforcement) was put forth in 1973 by Susan Baker in the tenth edition of Sartwell's *Preventive Medicine and Public Health* (Baker, 1973; Pearn, Nixon, & Scott, 2004). In 1989, the National Committee for Injury Prevention and Control adopted a similar paradigm, labeling these approaches as education, engineering, and enforcement. Table 1.1 summarizes suggested criteria for these three strategies to be effective.

TABLE 1.1. CRITERIA FOR EFFECTIVE USE OF INJURY PREVENTION STRATEGIES.

Education	Engineering	Enforcement
Audience must be:	Modification must be:	Law or regulation must be:
Exposed to the appropriate information	Effective and reliable	Widely known and understood by the public
Understand and believe the information	Compatible with the environment	Acceptable to the public
Have resources and skills to take action on the information	Result in products that dominate the marketplace	Probability (or perceived probability) of enforcement is high
Derive benefit (or perceive a benefit) from taking action	Acceptable to the public	Punishment is (or is perceived to be) swift and severe
Be reinforced to maintain the change over time	Easily understood by the public	
	Properly used by the public	

Source: Based on Sleet and Gielen (1998).

Education was the mainstay of early injury prevention efforts because it was consistent with an orientation to injury causation that focused on the individual's behavior. At the time, it was believed that information and education on risks of injury might be sufficient to change behavior. Educational approaches were also relatively inexpensive compared to more intensive efforts (Pearn et al., 2004; Stevenson et al., 2004). Historically, education referred simply to awareness or information campaigns. Early safety campaigns, which were largely ineffective, focused on preaching safety, arousing inappropriate levels of fear, and victim blaming (Gielen & Girasek, 2001). Just as the injury field was evolving, so too was the health behavior change field, and early injury prevention education did not incorporate scientific advances in learning or behavior change theory or what was known from health communication research. More recent educational approaches have met with greater success, most often when they incorporate improved access to recommended safety products, use theory-based approaches, and apply principles of community participation (DiGuiseppi & Roberts, 2000; Towner, Dowswell, Mackereth, & Jarvis, 2001; Klassen, MacKay, Moher, Walker, & Jones, 2000). As noted in Table 1.1, contemporary approaches to using education recognize that providing information is only one element. Addressing an audience's beliefs, skills, resources, and need for continued reinforcement are additional necessary elements.

Ergonomics, engineering, and product design refer to modifying the built environment, equipment, homes, toys, and clothes, and these strategies have met with much success. For example, safer highways and automobiles have been credited with being instrumental to the reduction in motor vehicle injuries in the United States (Bonnie, Fulco, and Liverman, 1999). Engineering changes that eliminate, reduce, or modify the transfer of energy are well illustrated in the numerous other successful injury prevention examples, among them child-resistant packaging of medications, smoke alarms, bicycle helmets, energy-absorbing surfaces, and flame-resistant child sleepwear. These strategies are wholly consistent with and underscore the importance of the scientific advances that led to appreciating energy transfer as the key causal factor in injury.

The relationship of these strategies to behavior is in some cases obvious (as in the consistent and proper use of the safety product) and less so in other cases (as in behavioral responses to safety features of vehicles or use of safety products). For efficacious engineering solutions to be effective for the larger population, they must be widely available, accepted, and properly used. For example, early safety enhancements in motor vehicles were often available only in expensive cars, leaving large segments of the population unprotected. Air bags provide another example: they must first be designed properly and then used properly to provide

protection: the air bag on-off switch must be reset after use, belted passengers should sit twelve or more inches from the air bag, and small children should be seated in the back seat away from the air bag. These examples illustrate the notion of an active approach to passive protection.

Enforcement involves safety legislation and regulations that are used to modify products, environments, and individual behavior. Mandatory standards for products, roadways, and vehicle designs have been successful, despite often being controversial because of their cost to industry. For example, a device fitted to a disposable cigarette lighter to make it child resistant may cost the lighter industry from four to twelve cents per lighter, but may save two hundred burn deaths annually. Perhaps most relevant for this chapter is legislation that mandates certain personal behaviors, such as using seat belts, car seats, and motorcycle helmets. Safety legislation works but is often opposed because it interferes with individual freedoms. (Schieber, Gilchrist, & Sleet, 2000; see also Chapter Twenty, this volume). According to Pearn et al. (2004), legislation is typically the last strategy introduced and only after failed educational and voluntary ergonomic efforts to reduce a hazard. Legislative approaches require attention to issues of education, implementation, and enforcement so that the public is aware of and accepts the law. Although many safety laws are not consistently enforced and police often have considerable latitude in enforcement, widespread visible enforcement can increase public perceptions of the negative consequences of noncompliance (Gielen & Girasek, 2001).

Behavior Change and Injury Prevention

Behavior change is reemerging as an important element in injury prevention as our understanding of injury is now more complex and dynamic. The most recent Institute of Medicine report on injury (Bonnie, Fulco, and Liverman, 1999) highlighted psychosocial research as one of three promising areas for the injury field and recommended intensified research into "differences in risk perception, risk taking, and behavioral responses to safety improvements among different segments of the population, particularly among those groups at highest risk of injury" (p. 6). In addition, an even broader focus on behavior is relevant for several reasons, as previously described in Gielen and Girasek (2001).

First, legislative strategies often require behavioral compliance by those who are to be protected; examples are seat belt use and car seat use). Second, passive protection is often not absolute and requires behavioral adaptation by those who are to be protected. McLoughlin (1997) notes that air bags will continue to provide passive protection in crashes, "provided that vehicle occupants practice the necessary safe behaviors" (p. 245). Furthermore, even when new and safer prod-

ucts become available, existing unsafe products will still be in circulation and the public will need to modify or replace them. Baby cribs and walkers are good examples. Both have been made safer—cribs by reducing slat spacing and corner protrusions and walkers by eliminating the wheels—yet many older, unsafe ones are still available through hand-me-downs and yard sales. Finally, for some injury problems, technological or engineering solutions are not readily available or are unacceptable to the public. For example, there are numerous types of choking hazards for children, and it is infeasible, if not, impossible to redesign them all (Shield, 1997). Four-sided pool fencing is an example of an environmental modification that can meet with public resistance (Wintemute & Wright, 1990) because it interferes with the aesthetics of a residential pool. While the search for more and better passive protections continues, we must never lose sight of the human behavioral components.

The Haddon model, which has guided the field so effectively in terms of countermeasure conceptualization and development, may need to be extended and enriched to more adequately account for the importance of behavior on the effectiveness of countermeasures (Lonero et al., 1994; Gielen et al., 1992; Runyan, 1998). Behavior change, traditionally confined to only the first "E," education, is increasingly recognized as relevant to engineering, legislation, and enforcement. First, safety legislation frequently is used to modify individuals' safety behaviors. Second, policy and environmental modifications depend on the behavior of decision makers, and there is a critical need to better understand how to influence their behavior. Third, educating individuals to change their personal safety behaviors ignores the potential of also educating individuals to become change agents—to help advocate for and support policy and environmental modifications. Table 1.2 provides a summary of the relevant behavior change issues for the host, agent or vehicle, and environmental determinants of injury. (For a full discussion of these issues, see Gielen & Girasek, 2001.)

While the injury burden remains unacceptably high, there are notable successes in changing individual behavior. For example, the dramatic reduction in motor vehicle injuries and deaths has been declared one of the ten greatest public health accomplishments of the twentieth century (Centers for Disease Control and Prevention, 1999a). Although the number of vehicle miles traveled has multiplied ten times since the 1920s, the annual death rate has decreased 90 percent (Centers for Disease Control and Prevention, 1999b). Modifications to roadways and vehicles, increased use of seat belts and child safety seats, and decreased rates of drunk driving are the most frequently mentioned and well-documented reasons for the sharp decline in motor vehicle fatality rates (Centers for Disease Control and Prevention, 1999b; Nichols, 1994; Graham, 1993; Waller, 2001; Rivara & MacKenzie, 1999; Zwerling & Jones, 1999). Each of these successful interventions

TABLE 1.2. INTEGRATING BEHAVIOR CHANGE WITHIN THE EPIDEMIOLOGICAL FRAMEWORK FOR INJURY CONTROL.

	Host	Agent or Vehicle or Vector	Environment
Target audience for behavior change	At-risk individuals, public at large	Manufacturers, engineers, business leaders	Policymakers, law enforcement officials, engineers, media, health care providers
Behavior change goals	Modify personal risk behaviors; advocate for change in products, environments, and laws	Make safer products; make products easier to use safely; make safety products more accessible	Make safer environments; support and enforce safety legislation; promote public awareness and safety-enhancing social norms
Examples	Auto restraint use, drunk driving, use of safety products	Safer vehicles, child-resistant containers, smoke alarms	Safer highways, auto-restraint legislation, helmet legislation, media portrayals of injuries and risk behaviors

Source: Reproduced with permission from Gielen and Girasek (2001).

has important behavioral components. For example, the National Highway Traffic Safety Administration (2003) reports that the number of alcohol-related fatalities per year dropped from 26,000 in 1982 to 17,419 in 2002, and the alcohol-related fatalities per 100 million vehicle miles traveled declined from 1.46 in 1982 to 0.53 in 2002. In response to large-scale federal education programs, modest increases in voluntary seat belt use were observed: from 11 percent in 1980 to 15 percent in 1984 (Nichols, 1994). With mandatory seat belt legislation in place, overall national use rates have risen to 75 percent in 2002 (National Highway Traffic Safety Administration, 2004). By 1985 all fifty states (and the District of Columbia) had laws requiring the use of car safety seats (Nichols, 1994), and 99 percent of infants and 94 percent of toddlers are riding restrained (National Highway Traffic Safety Administration, 2004). These successes would not have been achieved had it not been for the use of a comprehensive, multidisciplinary approach that included strong behavioral science contributions. These advances also exemplify the importance of taking an ecological approach to injury prevention (see Chapter Six, this volume).

Another example focuses on the policy environment that changed dramatically with the introduction of laws requiring changes in the behaviors of restraint

use and drunk driving. The organizational environments of workplaces changes with requirements for using seat belts when driving for the job. The inter- and intrapersonal influences on these behaviors have also changed. Individuals are aware of the need to buckle up and not drink and drive through a variety of influences: the media, pediatric counseling, school programs, and social norms, for example. Taken together, these influences have changed the behaviors of millions of people and dramatically influenced the prospects of improved motor vehicle safety. Regarding drunk driving, for example, Graham (1993, p. 524) noted that in a relatively short time, "changes in social norms, in part spurred by such citizen activist groups as MADD, have apparently achieved what many traffic safety professionals believed was virtually impossible: a meaningful change in driver attitudes and behaviors resulting in a reduction of traffic fatalities."

There is an increasing number of meta-analyses and systematic reviews of the literature on evaluated interventions for injury prevention, some of which are focused on specific behavior change goals or approaches. For example, the Cochrane Collaboration has published reviews on a variety of injury prevention topics (www.thecochranelibrary.com). The Centers for Disease Control and Prevention–supported Task Force on Community Preventive Services has conducted systematic reviews of interventions to reduce motor vehicle injuries (Task Force on Community Preventive Services, 2005). Childhood injury prevention strategies have also been systematically reviewed (Klassen et al., 2000; Bruce & McGrath, 2005; Chapter Twelve, this volume), as have health promotion approaches to injury prevention (Towner, Dowswell, Simpson, & Jarvis, 1996). Readers interested in more examples of successful behavior change interventions and in learning about future research needs are referred to these sources as well as to the many other chapters in this book.

Conclusion

This chapter has provided a brief overview of the connection between behavioral science and injury prevention, reviewed the injury problem, discussed the advances made in injury prevention through the use of well-established epidemiological principles and methods, and described the role of behavior change in advancing injury prevention goals. Over the past twenty years, there have been substantial advances in reducing injuries and notable improvements in some safety behaviors. There are also broader roles for behavioral science to play in injury prevention. For example, we need to develop a better understanding of and ability to intervene in behaviors of decision makers who affect public safety through the products they manufacture, the laws and regulations they pass and enforce,

and the influential communications they deliver to the public through the media. We also need to build stronger alliances with the public, so that it becomes more aware of the opportunities for injury prevention and the policies and programs that serve communities to make everyone safer.

Models, theories, and behavior change strategies that can help reduce preventable injuries historically have been underfunded, underused, and underrepresented in injury prevention research and practice. Nevertheless, there has been growing interest in the application of behavioral science to injury prevention in recent years. For example, the Centers for Disease Control and Prevention has issued requests for proposals related to theory-based approaches to injury prevention. It has also provided funds to each of its injury control research centers around the country to conduct training and research specifically related to behavioral science and injury prevention. The theme of the American Psychological Association's 2001 initiative, "Psychology Builds a Healthy World," focused on the opportunity to improve health and prevent injuries through the contributions of psychology (Sleet, Hammond, Jones, Thomas, & Whitt, 2004). Prevention strategies for both violence and unintentional injuries were included in *Integrating Behavioral and Social Sciences with Public Health,* a collaborative initiative of the American Psychological Association and the American Public Health Association (Gielen & Girasek, 2001). At the 2002 World Conference on Injury Prevention and Control in Montreal, Canada, and again at the 2005 National Injury Prevention Conference in Denver, Colorado, special sessions on behavioral approaches to injury and violence prevention were included. Special issues of scholarly journals have been devoted to behavioral and educational aspects of injury and violence prevention (Gielen, 2002; Sleet & Bryn, 2003; Liller & Sleet, 2004), and systematic reviews of prevention strategies have highlighted the need for more effective educational approaches to behavior change and studies with enhanced rigor (Task Force on Community Preventive Services, 2005; Zaza et al., 2001; DiGuiseppi & Roberts, 2000).

Future challenges for behavior change in injury prevention include the application and testing of behavior change theories to different injury problems in diverse communities. Many examples of such applications are presented in this book. While legislation may have been credited with motivating many of the behavioral changes benefiting safety, the most successful examples have also involved education—not only to prepare the public but also to ensure that laws are not repealed or overturned. Although there is little evidence that education alone works to change behavior, it can be a powerful initiator of and reinforcer for change.

There are fewer examples of theory-based efforts to change safety behaviors voluntarily. Also, the population that has yet to adopt recommended or mandated safety behaviors can be expected to be more difficult to reach; they often repre-

sent subgroups of the population that have limited access to safety information and products. Little is known about the safety practices, beliefs, and needs of the many diverse groups of society, and it is unlikely that broad, general information campaigns alone will be successful in persuading them to adopt safety practices. Fortunately, such campaigns, once the mainstay of educational approaches in injury prevention, are less often used; instead tailored programs using well-researched and effective behavior change methods are employed (Nansel et al., 2002; Gentilello, Ebel, Wickizer, Salkever, & Rivara, 2005; McDonald et al., 2005; Gielen et al., 2002; Ebel, Koepsell, Bennett & Rivara, 2003).

This is an exciting time to examine injuries from a behavioral perspective. A substantial knowledge base for applying behavioral science to injury and violence prevention is developing, as evidenced by the scholarly work presented in the remainder of this book. Whereas injury prevention initiatives during the past forty years have tended to focus on the risk factors, the three E's, and passive solutions, strategies in the future are likely to focus increasingly on problems that require additional behavior change expertise. Applying the behavioral theories, methods, and approaches described in this book can go a long way toward understanding how and when behavior change can be facilitated to decrease injury.

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