

## Education versus environmental countermeasures

R Schieber, M Vegega

Is it really an either-or proposition?

An important debate arose repeatedly during a recent interdisciplinary, international child pedestrian safety conference concerning the relative value of pedestrian education and skills training versus engineering modifications.<sup>1</sup> Health educators and psychologists, particularly Drs Andrea Gielen from the United States and James Thomson from Scotland, acknowledged that, even though classroom education had not been particularly successful in improving pedestrian safety behavior among young children,<sup>2-4</sup> skills training had strong merit. Crashes between child pedestrians and motor vehicles declined after classroom education, but the degree of pedestrian behavioral change was not large.<sup>5-6</sup> By comparison, correct behavior for certain road crossing skills had increased up to 40%–70% among children exposed to skills training interventions in the United Kingdom,<sup>7-8</sup> and to 30%–50% of lower elementary school-children exposed to such training in the United States.<sup>9</sup> This positive outlook could be described as “the cup being half full”. The other point of view (“the cup being half empty”) was presented by Drs Ian Roberts and Fred Rivara, who argued that no single educational program had demonstrated sufficient impact on the majority of students to merit endorsement and widespread dissemination.

Indeed, a recent systematic review of community based education studies aimed at reducing child pedestrian injuries concluded that such programs have modest and limited benefit, and that “even after training, young children remain at substantial risk for pedestrian injuries”.<sup>10</sup> One consequence of that position is to suggest abandoning any future attempt to educate or train children in street crossing, and in its place, to emphasize the institution of environmental (roadway) changes and the passage and enforcement of pro-pedestrian laws and ordinances, such as enforcement of speed laws.

This difference of opinion is critical because it is one of the most divisive among experts in this field. The problem arises because, for pedestrians, the margin of error is so small. When a vehicle strikes a child pedestrian, the child is

likely to sustain an injury, whether severe or not, because the difference in momentum between the vehicle and child is so great, due more to differences in mass than on velocity. Although relatively few injured children die, one might imagine that a non-fatal injury could have been fatal had the child been struck more directly instead, or had he rolled under the car or been dragged. As traffic density and vehicle speed increase, so does the risk to any given child pedestrian, assuming other risk factors remain constant. Furthermore, children are frequently put at risk, because at some time during the day, all children are pedestrians, if only to walk through a parking lot to their parent’s vehicle, or to chase a ball from the front yard. During such activities, children may not even think of themselves as pedestrians, because at such times, they think they are playing, not walking, when in fact they are doing both.

Given this enormous risk, to what extent does a child’s behavior in traffic need to improve in order to judge a program to be a prevention success? Is a 20%, or even 50%, improvement sufficient? And is such correctly performed pedestrian behavior generalizable to all traffic environments the child is likely to encounter? What constitutes successful prevention via environmental change? For example, what reduction in speed from traffic calming measures is sufficient?

It is becoming increasingly clear to the injury research community that merely learning about traffic has no certain bearing on a child’s street crossing behavior. For this reason, the large number of pedestrian education classroom courses may not accomplish their objectives, or may even seem unnecessary, unless accompanied by practical skills training. Even so, some classroom education may still be needed to give children the cognitive groundwork they need to master the skills training. In other words, classroom education may be necessary but not sufficient for safety. Once taught, the child must be helped to generalize such skills training, lest he or she be able to deal with only one traffic situation. This may be one reason that

training at a miniature safety town may not be sufficient, although it might be a place to start.

The pedestrian safety field lacks the promise of a single magic bullet solution. The prevention of child pedestrian injuries is a multifactorial problem involving, at least, individual characteristics of the child, environmental design, and mutual dependence between the child and his or her environment.<sup>11</sup> Indeed, during this conference, educators, traffic engineers, and planners all agreed that their own field did not presently provide the entire solution. Those advocating environmental interventions noted that education of adults as supervisors had merit, while those advocating for training acknowledged that their programs did not ensure safety for all children.

How then might this issue be resolved? First, we should honestly appraise all types of programs directed at pedestrian safety, whether they promote education, skills training, engineering, law enforcement, or a combination of these. All types of intervention should be held to the same standard of evaluation. One should not merely assume that engineering strategies will work because educational strategies do not. Second, cross disciplinary discussions need to continue among experts to relate and compare their findings, including strengths and limitations of each type of program, and help each other to improve them.

Third, we should consider what would happen if we abandoned all attempts of any one approach. For example, the likely consequence of abandoning pedestrian safety education of young children in school is that parents and caregivers would, by default, bear more responsibility for such teaching, even though they may be poorly equipped to do so. Or, children might teach themselves by trial-and-error, a potentially deadly means. Eventually children must learn how to interact safely with traffic, including how to cross the street, just as they learn to ride a bicycle, because such actions are an inevitable part of growing up. If pedestrian safety education and skills training begins at a later stage of childhood, would children, by themselves or through the instruction of caregivers, learn incorrect or incomplete safety strategies? Would important teachable moments be lost? Would teaching and training at a later stage of childhood be easier if children received certain types of instruction at a younger age? What proportion of our resources and energy should be devoted to teaching and training pedestrian skills, rather than teaching safety for other potential causes of injury? These issues need to be considered if injury prevention professionals around the world are to commit

to developing a comprehensive, interdisciplinary approach to reduce pedestrian injuries among children.

An understandable concern is whether, in the ever increasing competition for federal, state, and local funding, the "next dollar" should be spent on an engineering intervention versus education and training program. One solution might be to spend some funding on each. This suits the position that, in the end, the best solutions are probably those that involve a mix of both environmental change and pedestrian skills training programs. However, serious attention needs to be spent on enlarging the total amount of funding available, not just dividing up the same amount differently. In doing so, the complex societal problem of child pedestrian safety is more likely to acquire a longlasting solution.

And finally, to what extent does such a debate apply to other areas of injury prevention, whether for children or adults? For many areas (for example, bicycling safety, drowning prevention) public health professionals have long recognized that multidisciplinary efforts are likely to be more successful than any single type of effort alone.<sup>10</sup> Perhaps a multidisciplinary, multifaceted approach should be our standard for pedestrian injury prevention programs. This would also provide a more neutral tone for

bringing experts with diverse professional backgrounds together. Consequently, it may help us achieve our goals, held in common by all experts, more quickly.

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#### Authors' affiliations

**R Schieber**, Division of Unintentional Injury Prevention, National Center for Injury Prevention and Control, Centers for Disease Control and Prevention (CDC), US Public Health Service, US Department of Health and Human Services, Atlanta, Georgia

**M Vegega**, Office of Traffic Injury Control Programs, National Highway Traffic Safety Administration, US Department of Transportation, Washington, DC

Correspondence to: Dr Richard A Schieber, National Center for Injury Prevention and Control, Centers for Disease Control and Prevention; 4770 Buford Highway, NE Mailstop K-63; Atlanta, GA 30341, USA; rbs4@cdc.gov

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