Child Pedestrian Injury Interventions: A Systematic Review

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Children’s Pedestrian Injuries

- 5,300 American pedestrians are killed annually; 85,000 are injured
- 33% of injured pedestrians are children
- Almost 10% of all injured pedestrians are between the ages of 5-9
The Problems

- Crossing the street safely is a complex cognitive, perceptual, and motor task.
- School-aged children frequently negotiate street environments unsupervised but lack the cognitive, perceptual, and impulse-control skills to do so safely.
- We have a poor understanding of the behavioral factors that influence child pedestrian safety.
Study Objective

- Conduct a systematic review of individual-level behavioral strategies to reduce child pedestrian injury
- Did not include engineering strategies
- Did not include community-level strategies
- Six strategies emerged
**Parental Instruction**

- **Pros**
  - Parents have ample opportunity to train children
  - Early evidence of efficacy

- **Cons**
  - Parents tend not to teach children pedestrian safety

- **Empirical findings**
  - No rigorous evaluations available
School Instruction

○ **Pros**
  ● Large portion of child pedestrian injuries occur near schools
  ● Qualified educators and receptive students are present

○ **Cons**
  ● Schools have limited resources and time
  ● Effective training (individualized or small groups) is highly labor intensive

○ **Empirical findings**
  ● Well-designed, well-delivered classroom instruction offers moderate improvement
  ● Individualized or small-group lessons at streetside locations appear to be effective, especially for ages 7-9
Crossing Guards/Walking School Bus

○ Pros
  ● Large portion of child pedestrian injuries occur near schools
  ● Maintain safety besides training children in safety
  ● Qualified educators and sometimes older students are present at schools

○ Cons
  ● May give false sense of security and safety
  ● May lead toward protecting children rather than training them
  ● Crossing guards only protect children at guarded crosswalks

○ Empirical findings
  ● Effective if done properly
  ● Any skilled pedestrian can do the task adequately, including older children
Streetside Training

○ Pros
  ● Offers repeated practice with feedback
  ● Most effective strategy currently known

○ Cons
  ● Highly laborious, demanding of resources
  ● Long-term skill retention is unclear among younger children (ages 5-6)

○ Empirical findings
  ● Appears to be effective for ages 7-9
  ● Appears to have some efficacy for ages 5-6, although long-term retention in this age group is questionable
  ● Appears that any skilled pedestrian can teach skills adequately
Instruction via Video or Internet

○ Pros
  ● Minimal adult involvement
  ● Requires minimal resources (financial and other)

○ Cons
  ● Efficacy unproven

○ Empirical findings
  ● Some evidence of increased knowledge
  ● Minimal evidence of change in actual pedestrian behavior
Virtual Reality

- **Pros**
  - Minimal adult involvement required
  - Repeated practice possible without risk
  - Can be tailored to child’s ability level
  - Surprisingly affordable

- **Cons**
  - Efficacy unclear
  - Some expense, especially at start-up

- **Empirical findings**
  - Early evidence is promising
  - Large-scale RCT currently underway to evaluate virtual reality, streetside training, and video/online training compared to no-training control (children ages 7-8)
Conclusions

- Pedestrian injury is a significant public health burden.
- Crossing streets safely is a complex cognitive, perceptual, and motor task.
- Children cross streets alone with some frequency, and are vulnerable to serious injury.
- A range of behavioral strategies is available to teach children pedestrian safety.
- Individualized streetside training is most effective, but extremely time- and labor-intensive.
- Virtual reality offers a promising alternative since it encompasses repeated practice and feedback without the resource-intensive nature of streetside training.
- Multifaceted approaches, including training of children but also road and traffic engineering, community-based change, and driver awareness, are recommended.
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