

Classroom based instruction such as the Green Cross Code has been found to have had little effect on behaviour and child casualty rates. New approaches are emerging which focus on practical training, and which should begin as soon as children start school.

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What Teachers need to know about child pedestrian safety: Pointers for your next lesson

New approaches focus on practical training and should begin as soon as children start school

Child pedestrian road accidents are 56% higher in the UK compared with other European countries.

Child pedestrian road accidents, responsible for a quarter of deaths among children, are 56% higher in the UK compared with other European countries.

The International Road Traffic Accident Database shows that in 1995 the average death rate per 100,000 population for child pedestrians in European countries was 0.9 whereas in Great Britain it was 1.2. This contrasts with Britain's overall performance in road safety, with the casualty rate among the lowest in the world.

The problem may get worse in future, given increased government emphasis on children walking to school, with many local authorities having a 'walk to school' week.

Increased car use

Paradoxically, the reduction in child pedestrian casualty figures achieved before the nineties may be due to increased car use due to the dangerous road environment (Hillman et al, 1990). Between 1971 and 1991 the percentage of 7 and 8 year old children travelling to school alone dropped from 80% to 9%. Unfortunately this also reduced opportunities to practise pedestrian skills.

Road accident rates rise with age, peaking at about twelve years of age. Boys, and children from lower socio-economic groups, display higher rates, though these may be due to greater exposure. Such children are allowed more freedom on the roads without adult supervision.

Increased exposure is associated with higher accident rates, though Demetre (1997) argues that safe behaviour can only be attained through a degree of exposure on real roads. Also evidence exists linking accidents with dimensions which could be labelled 'problem behaviour', for example delinquency, deprived background, dangerous behaviour, and aggression.

West et al (1999) obtained measures of anti-social behaviour such as theft, violence, vandalism, fighting, and bullying, using self-report, parent, and teacher ratings, in a sample of 581 children. Problem behaviour was found to be a strong predictor of road accidents. Most accidents involving older children (11-16 years of age) occur while crossing or waiting to cross the road, while with younger children they tend to occur while playing (Christie, 1995).

Reducing casualty rates

Government attempts to reduce casualty rates can broadly be divided into engineering and educational. No-one who drives in a city can have failed to notice a range of traffic calming measures such as narrowing roads, creating more pedestrian 'islands', and the infamous speed 'hump'. Educational measures have traditionally been conducted in the classroom using the Green Cross Code, or Stop, Look, Listen, Think, for under 7 year olds.

However, as Thomson et al (1996) point out

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in a comprehensive review, the aim of such teaching is to provide general information about the dangers of traffic, and to encourage children to have safer attitudes. Children were told what to do rather than being shown how to do it. The assumption was that safer behaviour would follow, though there is no research evidence of this.

Child development theory

Major theorists in child development (e.g. Piaget, 1985, Gibson, 1969, and Vygotsky, 1978) point to learning acquisition occurring in the opposite direction, that is, beginning with the concrete (action), and moving on to more abstract conceptualisations. Also, as Thomson et al (1996) point out, rule-based teaching, as in the Green Cross Code, takes little account of the complexities of the road environment. It would not be safe even for adults to use, if adhered to slavishly.

In addition, the teaching of road safety has, in common other aspects of education, been heavily influenced by Piagetian theory, which proposes that cognitive development takes place in an ordered series of four stages. Transition to a higher stage results from the interaction between internal biological structures and external stimulation (eg teaching).

Therefore little can be achieved through education without maturation of these internal structures - that is, until the biological time switch is activated. In line with this, Sandels (1975), for example, suggests that young children (ie less than 7-8 years of age) lack the necessary cognitive capacity to cope with pedestrian skills.

However, more recently, the inflexibility of Piagetian theory has been questioned (e.g. Smith, 1993), and evidence suggests that though the process holds true, there is much more flexibility over what can be attained at specific ages through education or environmental stimulation.

Research programme

The Department of Transport has embarked on a programme of research aimed at increasing understanding of children's road accidents, and their capabilities at different stages of development.

The programme began with a review of existing research by Thomson et al (1996), which was followed by a number of research projects, the results of which were published in *The Psychologist* (August, 1999). A third stage of the programme is now in progress. Guidelines for a new approach to road safety education should emerge, though there are already clear

indications of its likely direction. Some findings from the programme are reviewed below.

Foot et al (1999) view 'crossing the road safely' as a skill, which they conceptualise as a sequence and accidents can result from deficiencies at any stage. There are five stages:

- ✓ Detecting traffic presence
- ✓ Recognising safe/dangerous locations
- ✓ Visual timing
- ✓ Co-ordinating information
- ✓ Co-ordinating information and action

Detecting traffic presence

The child must first of all detect traffic presence. This involves a visual search, and the selection of relevant from irrelevant features. Research shows that up to 50% of children do not look before starting to cross the road, and 25% of pedestrian casualties 'almost certainly' failed to do so (Scottish Development Department, 1989).

Also Thomson et al (1996) have observed children making ritualistic head movements from side to side, but too quickly to actually see anything dangerous. A visual search can fail to spot traffic (e.g. Grayson, 1975), or to reveal potentially dangerous features.

Foot et al (1999) found that when asked simply to describe a road scene, adults listed relevant (dangerous) features such as moving and parked cars, whereas children focused on irrelevant features, such as trees and houses.

However, when asked to say what someone 'should look out for' to get across the road safely, eleven year-olds produced more adult-like responses, nine year-olds focused on relevant and irrelevant features equally, while five and seven year-olds still listed irrelevant features. Support for these results was found in roadside tests. Clearly young children do not know what to look out for, and it was suggested that practical training can help to remedy this.

Recognising safe/dangerous locations

The next step is to recognise safe/dangerous locations - especially places where it would be dangerous to cross. Places where a child's view of the road is obstructed tend to be associated with accidents, and young children are poor at identifying safe places (Ampofo-Boateng and Thomson, 1991). Also recent research found that children, unlike adults, do not use danger as a category for classifying features of a road situation, though performance improves with age when prompted (Dunbar et al, 1999). The instruction

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Visual timing

Visual timing involves for example time-to-contact judgements, requiring consideration of both speed and distance, and these are poor in children (Lee et al, 1984).

At certain stages of development, children tend to focus on one aspect exclusively (eg distance), and are unable to take both into account simultaneously (Piaget, 1985).

Co-ordinating information

Children also need to co-ordinate information from different directions, which entails performing two or more tasks at the same time, and switching attention. The ability to do this efficiently improves with age (e.g. Dunbar et al, 1999), as does the ability to identify relevant information leading to decisions about behaviour.

Co-ordinating information and action

Finally, co-ordinating perception and action involves relating time available to time required to cross. One aspect is the judgement of 'safe gaps' between moving cars.

Lee et al (1984) used the clever method of setting up a 'pretend road' alongside a real road, and asked children to cross it when it was safe to on the real road. Around 45% of safe gaps were refused by 5-7 year-olds (compared with 10% for adults), but 'tight fits' were accepted on 9% of available gaps, with potentially severe consequences on the real road. Mistakes made on the pretend road can be used to promote safer behaviour.

A related aspect involves the construction of 'pedestrian strategies'. Whitebread and Neilson (1999) found evidence of a developmental change, at around 7-8 years of age, when children move from continuous information sampling to making predictions, which appears to be related to the development of general cognitive abilities. It is suggested that safety training should focus more on the development of safe strategies for crossing the road.

The role of education

What are the implications for the role of education?

- ✓ Road safety education needs to begin as soon as children go to school

It is now accepted that children are capable of acquiring quite complex skills, through

appropriate training, at a much younger age than was thought possible.

- ✓ The emphasis needs to be on practical training, in as real an environment as possible

Children should be taught specific skills at the roadside as far as this is possible. Thompson et al (1996) suggest taking groups of 4-5 children, and asking one child to choose a safe place, or to identify dangerous features, or when it is safe to cross, etc. The others may then be asked to comment on the merits of the choice. The peer interaction aspect of ensuing discussion can be very conducive to learning. Another child can then take the lead. Varying roles will facilitate the ability to see events from differing perspectives.

Substantial improvements have been obtained with six half-hour sessions using this method. Where this is not practical other techniques may be viable.

Some schools may be able to set up pretend roads if a playground runs alongside a real road, a real road may be blocked off for a period of time, or mock-ups are possible in the playground. Also, in time, research may lead to classroom alternatives based on table top models, or video-training.

- ✓ Classroom activities can have an important role

Discussion in a classroom should be used to support any practical training. It can help to make children think about the differing possibilities, and it will expand and develop their concepts.

Other materials, such as books, films, and videos can also contribute in this way. Such discussion can be used to encourage the conceptual transition from visual search to making predictions about opportunities to cross.

- ✓ Parents are a valuable resource for teaching safety skills

This may be difficult for many adults who are accustomed to taking charge at the roadside, and allowing children (especially very young children) no autonomy.

Training may be required, but the adult must encourage the child to make decisions, and Thomson et al (1996) cite the work by Wood (1985) on the optimal adult role.

The strategy is to reinforce successful behaviour with general verbal prompts, but to intervene and demonstrate specific behaviour when behaviour is completely unsuccessful, reverting to general prompts when improvement occurs.

The Green Cross Code, takes little account of the complexities of the road environment.

There is much more flexibility over what can be attained at specific ages through education or environmental stimulation.

- ✓ Boys, children from lower SES backgrounds, and those displaying 'problem behaviour' are more at risk

There may be a case for targeting those most at risk, especially when resources are limited. This would also include children who are about to go to, and those who have just begun, secondary school since pedestrian casualties are highest for this group.

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