Bringing children into the social contract of road use: Final report
Road Safety Research Report No. 33

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Final report

Sharon Wood, Stephanie Thornton, Elizabeth Arundell and Lida Graupner
University of Sussex

April 2003

Department for Transport: London
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Executive summary

This project builds on the Phase One Child Development Project (Thornton et al., 1998), which endorsed the need to teach traffic skills, and reported a previously unknown developmental change in how children represent the goals of road safety (the transition from damage- to error-avoidance) that was postulated to have implications for the extent to which traffic skill training will transfer.

The aim of this project was to develop and evaluate a booklet for parents to support them in teaching traffic skills and comprehension to their own children and also to induce an error-avoidant perspective and consistent spontaneous deployment of traffic skills at the roadside.

The project was divided into two stages. The first was a series of pilot studies in ‘contrived naturalistic’ environments to investigate the effectiveness of the scheme as a whole (including parental ability to mediate it). The second stage involved large-scale surveys to investigate the scheme’s success under more ‘naturalistic’ conditions.

The pilot studies demonstrated that parents can reliably execute and score all the dynamic elements in the booklet (the walks, quizzes, and other tests) and that they can use these tools to determine what their child needs to learn next. Further, the experience of the quiz task systematically fostered an increase in error avoidance.

This stage concluded with a larger-scale pilot evaluation of the booklet within a fairly contrived environment. Parents were asked to use the booklet over the school summer holidays and make three successive data returns over that period. Seventeen per cent of parents complied and returned all three data sets at appropriate intervals. Socio-economic group (SEG) was not a significant factor in these return rates. Children across all ages and SEGs showed significant gains from using the booklet in traffic skills and comprehension, in spontaneous (uncued) traffic awareness, and in error-avoidance, compared to control data. Furthermore, while gains in traffic skills per se were not associated with improvements in children’s spontaneous (uncued) traffic hazard awareness, increases in error-avoidance were significantly related to increases in spontaneous traffic hazard awareness, as Thornton et al. (1998) predicted.

Following these pilot studies, in the second stage a large-scale (10,000 booklet) survey was undertaken, in May 2000, under naturalistic conditions. Booklets were distributed to children via schools, with the intention of analysing quiz data returned by parents. Unfortunately, the passive method of distribution led to an extremely low return rate and the quantity of data obtained was inadequate for analysis purposes. Subsequent follow-up of some of the parents (who had returned material), schools, and road safety officers pointed to a number of administrative problems having impacted on people’s willingness to participate. These included the lack of structural support for parents (including timetables), the additional burden placed on participants for the data gathering part of the exercise, the lack of an ‘opt in’ commitment, and the lack of immediate incentives for participation. When such issues were addressed in the subsequent large-scale survey (September 2000, with
nearly 2,000 booklets distributed), the data return rate improved considerably – although there was still perceived to be a general lack of desire, for many different reasons, to participate in a study of traffic skills.

The results from this second survey demonstrated that, overall, children’s traffic skills and hazard awareness improved significantly. Indeed, there was a significant relationship between improvement in scores on the yellow (traffic skills) and green (hazard-awareness) tasks. The general effect was for a greater improvement generally on the scores of younger children compared to older children: the clear age difference present before the scheme was eradicated by the end. There were no significant effects of gender, SEG, region or location of residence on skill developments. The scheme also induced a general shift in the children from a damage- to an error avoidant perspective. Overall, children residing in rural areas are more likely to be damage-avoidant, and the gap between rural and urban children on remembering to stop at the kerb widens for older children.

Subsequent follow-up of the parents involved in the scheme demonstrated support for both the booklet itself and its intentions. Most found it easy to use and an effective mechanism to help them teach road safety issues to their own children. Parents reported an appreciation of the road safety task from the child’s perspective, understanding how this might differ from the problem for the adult, and many said that subsequently they would actively involve their children in decision-making at the roadside.

This report concludes with an assessment of some of the issues raised by the research, in particular the need to undertake ‘risk assessment’ of the potential effectiveness of large-scale surveys. Further potential work is also suggested.
Chapter 1  Background to the project

This project was designed to develop a practical road safety scheme for 5- to 8-year-old children, using strategic interventions based on developmental changes in social perception. It was built on earlier fundamental research into developmental changes in pedestrian behaviour, sponsored by DETR (Phase One Child Development Project: Thornton et al., 1998).

1.1 The Phase One Child Development Project

The Phase One Child Development Project reinforced and extended the widely accepted finding that there are clear developmental changes in children’s attentional strategies on the roads (Tolmie et al., 1998). These changes occur in their roadside decision-making (Whitebread & Neilson 1998) and in their resources for cognitive control (Lewis et al., 1998). The work also suggested that targeted interventions could improve children’s attention strategies and decision-making, and have a critical place in road safety education.

The earlier work also reported a completely new finding of strong developmental changes in how children interpret events on the road and assign blame for accidents or near misses (Thornton et al., 1998). When determining blame for an accident older children (over about 8 years old) take a more adult view; they look to see whose actions caused the sequence of events leading to the accident and allocate blame to the accident-causing protagonist(s). Younger children, on the other hand, ignore causal sequences when allocating blame and focus only on which protagonist has directly caused damage. For example, when asked to comment on a scenario in which a child steps into the road and a vehicle swerves into a market stand, the older child blames the child (for stepping out and causing the driver to swerve) whereas the younger child blames the driver (for damaging the market stall).

Since how one assigns blame reflects how one construes appropriate actions, this work implies that younger and older children hold different goals as pedestrians. The older child seeks to avoid actions or errors that might lead to an accident, while the younger child seeks only to avoid directly damaging things. Thus the older child can be said to have an ‘error-avoidant’ perspective of accidents whereas the younger child is more ‘damage-avoidant’.

In the original study, the difference between these two perspectives was hypothesised to reflect general developmental changes in understanding the causal aetiology of traffic accidents, such as in the naive physics of vehicle movement and stopping properties or the child’s understanding of a driver’s psychological limitations (reaction time, attention, etc). However, Thornton et al. (1998) demonstrated that the key difference between the two approaches lies in the developing child’s understanding of the social processes of road safety.

Maintaining road safety is a social-interactive process as well as a perceptuo-cognitive one. Adults do not keep themselves safe on the roads solely through individualistic use of cognitive or perceptual judgement processes. Rather, they maintain safety through a variety of social processes including calculating the intentions and expectations of other road users,
negotiating with other road users and the like (for example, Wood, 1993; Batson et al., 1978; Malamuth et al., 1978; Harrell & Bereska, 1992). Further analysis of the developmental change from damage- to error-avoidance (of the data from Thornton et al., 1998) has shown that this transition specifically reflects the development of an awareness of the social-interactive nature of road safety. The older, error-avoidant, child understands that his or her actions affect those of other road users and that all actions must be co-ordinated. Disaster can occur if the child’s actions run counter to the expectations or actions of other road users. Younger children, on the other hand, do not reflect the actions of others. They do not realise that their actions affect other road users, or that there is any need to co-ordinate with other road users to keep safe.

So the younger child acts as though an isolated individual in addressing road safety problems and takes no account of the needs of other road users. The older child, however, is effectively integrated into a social system – a contract, or set of shared expectations and mores – for road user behaviour.

This perspective begs an important proposition for road safety education: that damage- and error-avoidant children occupy different ‘problem spaces’ in relation to road safety. They are likely to focus on different factors when making decisions and will have differential understanding of the function of basic traffic skills. The cues they use to determine when a particular skill is relevant and should be used are likely to be different. Thus a child who understands the need to co-ordinate with other road users is likely to understand that hazard-search strategies are more important in some situations than others and will recognise where to focus attention, depending on the situation. By contrast, a child who is unaware of the need to co-ordinate with others will be cued more by physical features of the environment (kerbs, crossing places, etc.) than by social ones (such as the presence, location, and actions of other road users). In effect, an error-avoidant child has an insight into why road safety matters and how traffic skills help – perceptions that are absent in the damage-avoidant child. Thus it could be predicted that the error-avoidant child would be more likely to use traffic skills effectively and appropriately in a spontaneous way, when not cued (reminded) to do so.

Preliminary work has indicated, however, that schemes designed to enhance traffic skills per se do not necessarily foster the damage/error avoidant transition (Thornton et al., 1998). This may be because, although traffic skills training may occur in a social setting for example group work), it seldom focuses the child on the social interactive elements of the road safety task. For example, skills training tends to emphasise the individual child’s strategy in selecting safe places and times to cross. It does not highlight any interaction between such decisions and the expectations and intentions of drivers, still less the behavioural changes of drivers or pedestrians to accommodate the needs, expectations or intentions of the other, or the role of signalling in this process. Thus ‘normal’ traffic skills training probably does not give the child the kind of information that might easily provoke an error-avoidant perspective.

In the light of the results from the Phase One research, therefore, the project reported here was designed to extend and enhance the opportunity for transition towards error-avoidance
strategies. Thus it included both elements intended to improve the child’s basic traffic skills, attentional strategies and decision-making, and also interventions designed to induce the transition from damage- to error-avoidance. A key aim was to test the hypothesis that inducing error-avoidance would improve the impact of traffic skills training.

1.2 A new scheme for road safety education for 5- to 8-year-olds

Although there are powerful traffic skills training programmes (for example, ‘Footsteps’ and ‘Kerbcraft’), the extent to which such schemes have affected child pedestrian accident rates is unclear. Although direct evaluation of their impact is difficult, it has been suggested (Thomson et al., 1992) that the impact at a national level is slight; the schemes are resource intensive and not widely used. They require considerable input to the individual child in roadside conditions to be effective in changing skill levels in a sustainable way. Furthermore, discussions with Road Safety Officers (RSOs) suggest that they have too few resources to mount the necessary direct interventions on any meaningful scale (indeed, many authorities are unable to afford any kind of direct intervention scheme). The problem could be alleviated using parent volunteers working through schools, but volunteers are hard to find, have large drop-out rates, and could be impractical in high-risk schools where head teachers may not wish to take the responsibility for letting children out on the roads with parent volunteers. Such schemes may only be effective in the initial development phases, when research resources support them. In the general case they reach a small percentage of children and deliver only a fraction of the roadside training time required (personal communication with RSOs from seven counties).

The obvious resource for road safety training is the child’s own parent. Parents are, de facto, the primary educators in this field; they are the child’s main companion on the roads, the model from whom the child learns by observation and the arbiter of road safety strategies. By and large, parents do a reasonable job in this regard, to the extent that most children are never involved in a pedestrian traffic accident. At the same time, schemes aimed directly at supporting parents to educate their own child have shown that the average parent’s success in teaching road safety can be improved (Thornton et al., 1998). For example, use of materials previously developed for the parents of younger children can yield up to a 20 per cent fall in ‘dart-out’ accidents (Thornton et al., 1998). Thus, an important aim of this project was to produce materials that would support parents in teaching road safety to their own child.

Overall, the aims of the scheme reported here were to provide parents with materials that would:

- raise their awareness of pedestrian risks to the child;
- support their teaching of traffic skills;
- alert them to the need to create consistently safe approaches to traffic hazards in their child;
• support them in drawing the child’s attention to the social interactive nature of road safety; and

• sensitise them to the special problems faced by child road-users.

In meeting these goals, the project drew on the experience of earlier research into the construction of materials for parents. For example, it is clear that there are strict limits on how much text the general population will accept in such materials: the less text and more pictures the better (Thornton et al., 1998). Accordingly, the materials developed involved the minimum text required to convey a point and incorporated pictures and graphics to repeat the same message wherever possible. Except in the few cases where they formed part of a task for the parent to complete with the child, pictorial materials were designed to appeal to the adult rather than the child and to use humour to attract and keep parental attention.

Previous research (Bryan-Brown & Harland, 1999) has also shown that parents prefer schemes to be contained in a single booklet rather than in a series of progressive tracts. The dropout rate for multi-material programmes escalates as the work progresses from the first to second set. Accordingly, the scheme reported here provides only one booklet for parents to use as a training aid with their children.

Using only one booklet reduces the potential for creating a scheme based on any didactically specified sequence of skills to be mastered; there would not be space to cover the range of needs observed in 5- to 8-year-old children (cf. Whitebread & Neilson, 1998). Furthermore, earlier research has shown that parents do not like didactic schemes (Thornton et al., 1998): the more didactic specificity the more disruptive and onerous it is for the parent to comply – and the greater the drop-out rate. So there are strong arguments for moving away from didactic schemes, which parents also describe as “patronising”, towards methodologies that more directly empowers parents to teach their child to share their own knowledge. Rather than a total recipe of what to teach and in what order, parents need a combination of guidance and suggestions as to what the child should learn overall and some means of measuring what their child already knows and can do.

Since there is clear evidence (Platt, 1998) that parents systematically misperceive both how their child presently functions as a road user and what he or she could achieve, the materials developed for this project aimed to provide parents with both outlines of the targets they should strive for, and a means of testing their child’s behaviour against these targets.

In such a scheme, the amount of text can be minimised by constructing tests which themselves specify the target behaviour. This enables both tuition and testing to be undertaken within the same set of material.
1.3 Summary

This project aims to develop a single short booklet for parents to use in teaching their own child road safety. It has two functions: first, to provide guidance on how and what to teach, and second, to supply a means of assessing the child’s progress against targets in the acquisition and development of basic cognitive and perceptuo-motor traffic skills, habitual consistency in traffic awareness, and an error-avoidant perspective.

A key goal of the research was to test the propositions that:

• using such materials will encourage the development of traditional traffic skills; and

• inducing an error-avoidant perspective will enhance the impact of such training on the child’s everyday behaviour.
Chapter 2 The booklet

The 12-page, coloured, A4-sized, booklet produced for this project was generated through a series of drafts, each of which was revised in the light of comments from Department for Transport (DfT), Road Safety Officers (RSOs), other researchers, and on the basis of results from pilot studies of parental reactions to it.

The booklet described here is the final version. It had the overall aim of being a resource to help parents teach their own 5- to 8-year-old children to behave more safely on the roads, by:

- encouraging parents to use guided participation techniques in teaching road safety at the roadside, together with massed practice;

- emphasising the acquisition of the skills the child needs to keep safe, the understanding the child needs to recognise the appropriate circumstances in which to use those skills, and the need to encourage children to use those skills consistently; and

- providing parents with a means of assessing their child’s current prowess and tailoring tuition to take the child’s needs directly into account.

Three primary principles guided the design of the booklet:

- its content must have a principled research basis, drawing on existing research, for each of the decisions as to content and design of the handbook;

- the booklet and accompanying scheme should meet the needs of practicing RSOs, in the light of their concrete experience both of traffic accidents and of safety education, what might feasibly be implemented, and the issue of resourcing for road safety education; and

- it should comply with DTLR policy, as specified in the good practice guidelines on road safety education (Transport Research Laboratory [TRL]), and should discourage parents from allowing children in the target age range to go out on the roads unaccompanied.

2.1 Pilot studies to evaluate reactions to the booklet

Two studies were undertaken to evaluate the booklet’s appearance and appeal to parents. The first was a very small focus group where six articulate, well-educated (graduate and postgraduate) parents examined and discussed the booklet. Overall, they responded very positively to the booklet and identified a number of ideas new to them that they felt were useful in teaching road safety. They particularly liked the breakdown of the task into three elements, the emphasis on taking the child’s perspective into account, and the idea of sharing decision making with their child (these were described as being new and useful ideas). They liked the walks and quizzes incorporated in the booklet, and said that they would use the scheme. Criticisms centred on the quality of the graphics in this early version and the quantity of text.
The second study employed a broader group of 72 parents of 5- to 8-year-old children, drawn from across the socio-economic scale. They were asked to read the booklet, try out the material contained in it, and return the questionnaire a week later. The version of the booklet used was almost identical to the final version and was professionally produced by a graphic designer. It incorporated changes to clarify the graphics and some reductions in the text following comments from the preliminary focus group.

Twenty-six (36 per cent) parents returned their questionnaires. There was a slight, non-significant, trend relating return rate to socio-economic group (SEG), with the lowest group showing a weaker return. There were no apparent effects of SEG on the content of the replies to the questionnaire.

Spontaneous parental response to the booklet was generally favourable. Eighty-one per cent of respondents reported that it had changed their approach to road safety, and 84 per cent felt that they had learned something new from the booklet. Most respondents gave a clear endorsement of the usability and utility of the advice and procedures, and felt that the booklet was readable and user friendly. Negative comments were made about the quality of the graphics, which were improved before further piloting to produce the better quality of graphics finally used.

2.2 Booklet style and format

2.2.1 Advice to parents

There is some evidence that, at least among the parents of older children (11- to 12-year-olds), there is some hostility to traditional RSO-style leaflets offering comprehensive and didactic road safety advice (Platt, 1998). They are seen as dogmatic and as offering unrealistic prescriptions in the light of the actual road conditions and actions with which parents have to deal. This project and its booklet adopts the strategy of producing a leaflet for parents aimed at raising parental awareness, rather than proffering a comprehensive training scheme. A priori, this strategy seems not only to have the advantages of flexibility and acceptability to users identified by Platt, but also to empower parents to think for themselves about road safety.

2.2.2 Number of booklets

The decision to aim at raising awareness rather than at a comprehensive and didactic training scheme fits well with another constraint arising from previous research. The scheme requires two activities from parents: training and assessment. Experience has demonstrated, however, that using multiple handbooks creates problems, with loss of materials, discouragement, and falling compliance across booklets (Bryan-Brown & Harland, 1999). Rather than produce two separate booklets, therefore, for this project it was decided to give each parent a single booklet.
In relation to the question whether separate handbooks should be provided for children of different ages, again the evidence suggests that little benefit will accrue, since the correlation between age and road safety skill is relatively weak (Whitebread & Neilson, 1998). The use of alternative booklets for different developmental levels presupposes that the individual child’s developmental level is known, prior to entry into the scheme. Resourcing for the implied pre-assessments is most unlikely to be available to RSOs. Furthermore, a proportion of children are likely to outgrow the part-training assigned to them during the scheme, needing to go on to a second booklet – raising further resourcing issues, and exacerbating the problems of falling compliance associated with multiple booklets.

2.2.3 Length of the booklet

The evidence suggests that there are strict limits on how much material parents will read, particularly in the lower SEG populations that are most at risk of child road traffic accidents. For example, the TRL report that 25 per cent of lower SEG parents did not read the whole of the One Step Ahead material. Furthermore, although 75 per cent of those who read the material were generally positive about it, they wanted reduced text and more colourful pictures (Davies et al., 1998). On this basis, the project produced an A5 booklet containing no more than 12 pages, with minimal text, and supported by illustrations.

2.2.4 Assessment and training

Including both assessment and training functions in a single handbook opens up a range of possibilities for the relation between teaching and assessment. For example, they could remain as separate functions, or they could be integrated such that assessments explored the child’s zone of proximal development (for example Vygotsky, 1987) fairly directly. This latter possibility is attractive within the overall aims of the scheme, in that assessment becomes a key element that directs training. Thus, assessment procedures are tightly integrated with training in the booklet – encouraging parents directly to compare what the child can do with their support, cuing, etc with what she/he does without support.

2.2.5 User-friendliness

Schemes aimed at parents often suffer from poor take-up and high drop-out rates. While there may be many reasons for this, in some cases low user-friendliness may reflect parental dissatisfaction with the prescriptive nature of the materials (Platt, 1998). A review of existing schemes suggests that there is also the problem that they tend to require a fairly high level of commitment, both in reading wordy text and in translating this into roadside activities. Road safety is often portrayed as a special topic to be covered, rather than as an integral part of everyday activity. Setting aside time for road safety lessons with a child may be impractical since many may argue that mothers of young children often have difficulty in finding time for themselves in an average day, let alone for add-on activities. Finally, road safety materials often have a very worthy tone. They depict idealised behaviour in a calm and orderly world that may be far from the everyday experience and concerns of the average
parent. Such materials can be dull and de-motivating to read and there is evidence that parents are primarily interested in materials that relate to their own worries and experiences (Platt, 1998).

As far as the booklet itself is concerned, therefore, the design decisions outlined above (short, readable text supported by illustrations, offering awareness-raising information rather than a didactic scheme) are already in line with current research on best practice in securing user-friendliness of materials for parents. The detailed content of the material was thus structured to reflect parental concerns directly.

There are also strong grounds for supposing that humour plays an important role in enhancing the readability and uptake of handbook materials for parents. It is intrinsically motivating, enlivens the material, and diffuses tension, thus making materials more informal and approachable. It should not be forgotten that a percentage of parents, particularly those in the populations most at risk of child road traffic accidents, will have had negative and demoralising experiences of learning from written materials in school, and may well feel evaluative anxiety in relation to such materials. An irreverent, humorous approach may be more successful in such populations (and perhaps in all populations) than a worthy educational tone. Humorous drawings can act synergistically with text, carrying and reinforcing the same message. On this basis, the pictorial material synergic to the text in the booklet was intended, where appropriate, to have comic overtones.

2.3 Content and structure of the booklet

Platt (1998) reports that parents are not confident of their ability to assess their own child’s competence and safety on the roads: they do not know what they should measure when making such assessments. Nor are they confident in devising ways of teaching road safety: they do not know what they should teach or how best to teach it. Parents in Platt’s study were also aware that they did not really understand best practice and hazard on the roads themselves – and even where they were aware they did not always respond in the most sensible way. Although Platt’s sample was parents of 11-12-year-olds, there is no reason to believe that the parents of younger children are any different in these respects.

The implication is that handbooks aimed at raising parental awareness should go beyond simply alerting parents to the dangers and the need for education. They should also aim to educate parents to have a better understanding of road hazards (especially hazards that differ for adults and children), the principles underlying keeping safe on the roads, the cues to look out for in assessing their own child’s degree of competence and safety, and the principles underlying good teaching strategies (cf. Platt, 1998). This goal was adopted in the booklet for this scheme.

Within the stylistic guidelines described above, the booklet produced for this project:

- reminds parents of road traffic dangers;
- introduces the guided participation method for in vivo roadside training;
• provides specific tips on hazards and skills which children need to learn about;
• provides useable assessments of the child’s skills and actual uncued behaviour;
• provides materials encouraging the child to discover the causal role which pedestrians and others may play in generating accidents – and assess their child’s grasp on this; and
• provides advice on where to go for more help and training.

The front cover introduces the booklet and its aims by highlighting common concerns among parents in this age range: that the child might run out, and the increasing pressure through the primary years for the child to walk to school without the parent (for example with a neighbour and her children, with older siblings, with friends). These concerns are presented both in the cartoon and synergistically in the text, and serve to introduce the content of the booklet.

Pilot work showed that the presence of the small girl in the foreground enhanced the impact of the page, making the child pedestrians seem more vulnerable, and emphasising the need to ‘safety proof’ the child.

The picture is effective in gaining attention.
These pages introduce the three areas of training on which the booklet focuses:

- teaching know-how (that is skills);
- enhancing understanding of the problem posed by traffic; and
- encouraging consistently good habits.

Page 2 presents the three problems in text and synergic cartoon (the intention being to concretise and make more memorable the nature of each problem through the cartoons).

Page 3 emphasises the relative scale of road safety dangers (as compared to the more widely recognised danger of stranger abduction), and juxtaposes summary advice against the depiction of each problem on page 2. This summary advice is intended to both act as an aid memoire to what follows in the booklet, so that opening the first page of the book will effectively call to mind the contents (which we deem important in a population not given to much reading), and to structure/provide a map for the parent’s first reading of the booklet. The summary advice is obviously not intended as the complete advice to the parent.
Page 4 provides an outline of a teaching technique known as ‘guided participation’, which has been shown to be the most effective technique in teaching children practical skills (Radziszewska & Rogoff, 1991), and which most parents spontaneously employ to a greater or lesser extent (Wood et al., 1978). The initial drawing depicts a common domestic context in which children learn by joining in most families, which is also commonly depicted on television (shopping in a supermarket). The intent is to call to mind concretely the kind of relaxed shared activity that is required.

Subsequent drawings are designed to model specific interactions of a useful nature between parent and child at the roadside. These drawings depict an interaction that centres on choosing a safe place to cross rather than on choosing when to cross. Many parents realise that they should invite children to share the decision as to when to cross. However, previous observational work demonstrated that no parent ever asked their child to help choose where to cross, or ever mentioned doing so when interviewed. By illustrating the teaching technique with the decision where to cross, this page alone is likely to have some impact on what parents teach their children about road safety.
This page begins by emphasising that parents should share their own knowledge with their child, in line with both the implications of guided participation, and with the theoretical conviction that empowering parents by admitting/encouraging their expertise and responsibility will release more effective tuition from the parents (cf. Godwin, 1997).

However, the evidence suggests that parents are in fact quite insecure in their road safety knowledge (Platt, 1998). The majority of this page is given over to a table headed: ‘teach these 10 tips to save your child’s life’. These were derived following consideration of when and where child pedestrians have most accidents, and are therefore most at risk. In each case the text is written for maximum memorability, impact and succinctness – that is excluding the obvious things all parents already know (such as ‘stepping out without looking is dangerous’), and assuming that the suggestions will mobilise the parent’s own knowledge. The rationale for each tip is provided in Table 2.1 overleaf.
1 Don’t cross where drivers can’t see you

More than half of all accidents to 5- to 9-year-olds occur where the child was masked by an obstacle before crossing. Children need to be taught to stand in a clearly visible position before crossing, facing the road and looking about with large head movements, to signal to drivers that they are about to cross. Drivers accommodate to pedestrian behaviour all the time – but need to be told of the pedestrian’s intentions. Children need to be taught: if you can’t see far down the road, the cars can’t see you. They need help recognising what obstacles mask visibility.

2 Don’t cross if you can’t see far along the road

Children regularly choose crossing sites where visibility is restricted, reducing both their visibility to drivers and their ability to make reasonable judgments as to when to cross. Children need simple mnemonics to help them judge how good their visibility is: for example ‘Point down the road. If the road is shorter than your arm, see if you can cross somewhere else’. They need tuition on what forms an obstacle to visibility. Thus the aim of this page is to remind parents of the power of teaching through sharing problem-solving with the child, encouraging the child to contribute to decision-making, and explaining why one decision is better than another. The value of practical, in vivo, roadside training is also endorsed. The text and the pictures carry the message redundantly.

3 Look all round and listen carefully for traffic

Children regularly fail to look at the whole of the relevant road space when crossing. They need to be taught that cars may come from all directions – even from behind.

4 If possible, don’t cross at a junction unless there’s traffic lights

Over half of child pedestrian casualties are injured within 20 metres of a junction. Children lack the skills to judge traffic flows or choose safe routes at junctions. At this age, such crossing places are always dangerous without help. Parents (who will inevitably take their children across junctions without crossings) need to be alerted to this hazard, to the need to tell the child how dangerous such places are, and encourage/model wherever possible the safest strategy. Above all, parents should be encouraged never to take a child across a junction without commenting on the danger and on the steps taken to reduce it, so that the child is not desensitised to the special dangers of junctions.

5 The further you walk in the road, the more the danger

This tip covers both the idea that the shortest route across a road is the safest, and the idea that roads without pavements are dangerous. Adults regularly take the shortest route to their destination, even if this involves crossing the road diagonally. Parents need to be alerted to the dangers of modelling such behaviour to their child, as well as the need to teach a safer strategy.

6 Mind out for driveways

Although the incidence of child pedestrian accidents in driveways is low, in Lawson’s (1990) study in the Midlands, driveways provide the second most common location for car accidents. There have been a number of high profile accidents where parents have killed their children by driving over them in their own driveway (though the victims are generally younger than this target group). This tip is included here despite the ambiguity of its relevance to this target group because driveways are ubiquitous, commonly encountered on walks, and so provide an opportunity for massed relatively safe practice of looking for traffic – which is what is required for the fostering of the automatic habit of looking out for cars.
7 Parked cars might start moving

Over half of child pedestrian accidents occur in the vicinity of parked cars. In fact, most such accidents are probably due to masking effects, or to failed searches due to the child’s vision being obstructed. However, the habit of checking parked cars for signs of imminent movement (presence of a driver, engine running, signal lights) both serves to reduce the theoretical risk of being struck by a parked car moving off and reinforces the subtler habit of inferring the car’s next move, or the driver’s intention.

8 Sometimes it really is too dangerous to cross

The idea that the traffic flow may be too complex/too swift for one’s skills, and that it is appropriate to give up in such circumstances, is arguably the critical idea which the young should be taught. Anecdotal evidence (supported by pilot work) suggests that the young may try to use traffic skills, but when these fail, may go ahead with the crossing (“…then I shut my eyes and hope for the best”, as one 12-year-old put it – Thornton, 1998). Stopping such behaviour is essential.

9 When it’s too dangerous – cross somewhere else or get help

Young children need explicit instruction what to do if they should be confronted by too hard a road-crossing task. Adults need to explain explicitly their own solutions to such problems, like move somewhere else to cross, or find a controlled crossing, and also to teach the strategies appropriate to children, such as getting an adult to help.

10 Safety first

The tips conclude with a memorable slogan.
These pages continue the theme of parents sharing their knowledge by providing parents with specific roadside activities to complete with their child. These provide both a specification of what the parent should be aiming to encourage, and a means of assessing the child’s current prowess or behaviour as a basis for identifying what needs to be taught next. Thus they serve both a teaching and an evaluative function. The measure of uncued behaviour was also designed so that a follower-observer could unobtrusively make the same assessments as a reliability check, without having to be too close to the parent/child pair at the time.

The ‘Yellow Walk’ test gives the parent specific guidelines as to what the child ought to be able to do when asked to engage directly in the task of road safety decision-making. It suggests a number of specific tasks (such as planning a route across a crossroads) and provides specific guidelines as to what the child ought to do (for example, choose a site visible to drivers, crossing one road at a time, etc). The instructions for the task emphasise not only involving the child in discussions, but also explaining to the child why some decisions are better than others, and checking that the child understands what he or she is doing, and why.

The ‘Green Walk’ test gives guidelines as to appropriate traffic-aware habits to encourage and assess in a child who has not been reminded to execute road safety skills and is not participating in road safety decision-making in a dynamic way. The items on this test encourage responsibility – operationalised here as consistent traffic hazard awareness.
Parents are largely familiar with the need to teach traffic skills and to encourage good habits on the roads, but they are little aware of the need to teach the child the social interactive nature of road safety. However, there is no need for parents to understand the theoretical background supporting the thesis that understanding the social interactive nature of road safety is important.

Thus page 8 introduces the idea in a simpler way. ‘Blumpo’ is used to illustrate the point that, if one does not understand the nature of a hazard, one is poorly placed to know how to avoid it. The text and subsequent illustration emphasise that young children do not understand why traffic accidents happen, so are poorly placed to know how to avoid them.
Following the ‘Blumpo’ explanation, pages 9 and 10 present parents with materials (the ‘quizzes’) to discuss with their child. They are intended to support parents in discussing the causes of accidents, particularly the role of social interactions in preventing or causing traffic accidents. Thus they should foster the transition from a damage- to an error-avoidant view. They also enhance the child’s general understanding of how traffic skills function and why they matter.

Two versions of a quiz are provided for parents to use with their child, based on the Phase I research (Thornton et al., 1998), and aimed at enhancing the child’s comprehension of the causal aetiology of accidents, understanding of traffic flows and social expectations on the roads.

Each version includes four drawings depicting events on the road. The parent is encouraged to play the first version of the quiz at the outset and the second at the end of the training.

The four pictures are so structured that by comparing who is blamed across them research staff can identify the degree to which the child is responding to the probable causal factors in the depicted scene.
The final page (back-page) of the booklet reinforces the theme of the booklet as a whole. It graphically underlines the fact that children face different problems on the roads from those faced by adults, by juxtaposing a child and an adult eye view of a road when crossing between parked cars, and a driver's eye view of the relative visibility of a child and an adult standing at the kerb waiting to cross.
Chapter 3  Pilot studies of key elements in the booklet

Before undertaking any large-scale trial of the booklet it is important to test whether its dynamic elements (walks and quizzes) function as intended when parents use them. This section reports a preliminary series of studies designed to consider this issue, particularly the reliability of parental use and the extent to which the novel quiz task actually fosters a transition to error-avoidance. These studies do not examine whether the elements of the booklet are effective in changing children’s skills, understanding and habits when used with parents; that issue is addressed in further pilot studies in Section 4.

3.1  Pilot studies 1 and 2: Can parents use the yellow and green walks reliably?

The yellow walk is the primary method for parents to evaluate their child’s current skill level in road safety. By specifying the goals that the child should strive for, it is also a key teaching aid for skills training. The walk instructions ask the parent to execute certain roadside tasks, score the child’s performance and comprehension, explain decisions and problems to the child, and identify what the child needs to learn next.

The green walk was provided as a device through which parents could assess the child's road traffic-awareness and the likelihood of safe (‘responsible’) behaviour when not reminded to think about road safety. It is also a tool to remind parents to encourage habitual traffic awareness in their child.

The key questions for both studies was the extent to which the parents could execute the tasks reliably just by following the booklet text, whether they score their child’s behaviour reliably, and (for the green walk) whether they identify correctly what they need to teach the child next.

3.1.1  Method

For the yellow walk, seventeen mothers were recruited through schools in East Sussex, together with their 5- to 8-year-old child. Seven had children aged 5 to 6 years and ten had children aged 7 to 8 years. Five of the mothers were from socio-economic groups (SEGs) 1 and 2, five from SEG 3, and seven were from SEGs 4 and 5.

For the green walk, twenty-four mothers were recruited through their child’s school. Six of these mothers were from SEGs 1 and 2; nine were from SEG 3; and nine were from SEGs 4 and 5. Twelve mothers had children aged 5 to 6 years, and twelve had children aged 7 to 8 years.

For both walks, each mother met individually with a researcher at her child’s school and was given a sheet providing the instructions and materials for the appropriate walk exactly as they appear in the booklet. The researcher explained that the study was concerned to test
whether the instructions in the booklet were sufficiently clear to be effective as they stood, so no questions could be answered until after the test had been completed. The mother and her child then took a walk of approximately 20 minutes; the mother chose the route and executed the walk accompanied by the researcher. The researcher made no comment whatever on the mother’s execution of the task or on the child’s performance during the walk. Both mother and researcher separately scored the child’s performance on the walk using the scoring system detailed in the booklet. The researcher also scored how closely the mother complied with the walk instructions.

After completing the walk the researcher debriefed the mother, asking what she thought her child needed to learn next in the light of his or her performance, what she thought of the walk procedure, and for any comments she might have about it. Any queries raised by the mother were then answered.

3.1.2 Yellow walk results

Can parents execute the task reliably? Twelve of the mothers (71 per cent) executed the yellow walk perfectly. They selected appropriate routes for the walk and appropriate places for the child’s tasks, and followed the required procedure of engaging the child in decision-making and explaining why decisions were good or bad in every case. Two mothers made one or two errors in executing the task (for example, in omitting to explain one decision). Three mothers made more than two errors, omitting some elements of the task. All mothers executed at least 75 per cent of the task correctly. There was no significant effect of socio-economic class on these data, though there was a slight trend for mothers from lower SEGs to omit more of the task.

Thus the vast majority of mothers (over 80 per cent) completed the yellow walk exactly, or very nearly exactly, on the basis of the booklet instructions alone. Even the remaining mothers executed the task as intended for most of the time. Insofar as these data reflect parental behaviour when observed by a researcher they cannot, of course, be taken as evidence of what parents would do if not observed. However, the results confirm the main issue that the instructions and materials for the yellow walk are sufficiently clear that parents can use them reliably without further explanation.

Parental ratings of the child’s performance. There was a very high correlation between the mother’s and the trained researcher’s ratings of the child on the yellow walk (Pearson’s r=0.96, d.f.=15, p<0.001). This high inter-rater reliability strongly supports the conclusion that the yellow walk rating scales can be used reliably. In addition, 15 (88 per cent) of the mothers identified the same next goal for road safety training as had been identified by the researcher. There were no effects of SEG in any of these data.

Thus the yellow walk provides a means of structuring road safety training for parents. Parents can score their children reliably on the scales and can use the task reliably to identify what the child needs to learn next.
Parental views of the yellow walk. All participants commented that the walk was useful and described the task as being easy to execute. Typically, the comment was that it helped to tell the parent what to teach, rather than just having a “general aim” of keeping the child safe.

Children’s scores on the yellow walk. Overall, the mean child score on the yellow walk was 32 (out of a possible maximum of 45). The 5- to 6-year-old group scored a mean of 24 while the 7- to 8-year-old group scored a mean of 37. This age effect is statistically significant (F= 16.9, d.f.= 1, p<0.005). Thus the yellow walk provides sufficient challenge for this age group and is sensitive to developmental change.

3.1.3 Green walk results

Can parents execute the green walk reliably? Twenty-one (86 per cent) mothers executed the task exactly as intended. The remaining three mothers prompted their child to focus on road safety or prompted traffic skills more than was required. There was no effect of SEG in these data.

Parental ratings of the child’s performance. There was a very high correlation between the ratings made by mothers and by the trained researcher (Pearson’s r=0.81, d.f.= 22, p<0.001). As with the yellow walk, this high degree of inter-rater reliability strongly supports the conclusion that the rating scales incorporated in the green walk are reliable in general use. In addition, all mothers identified the same thing as the next goal for road safety training for their child as had been identified by the researcher. There were no effects of SEG on any of these data, which support the conclusion that the green walk provides a systematic means of structuring road safety training for parents.

Parental views of the green walk. Twenty-three of the mothers (96 per cent) commented that they would use the green walk procedure with their child, that the procedure had revealed something new about their child’s behaviour, and that it would act as a useful reminder to watch and shape actively their child’s roadside behaviour.

Children’s scores on the green walk. Overall, the mean score children obtained on the green walk in this study was 12.6 (out of a possible maximum of 25). The mean for the 5- to 6-year-olds was 8.5, and that for the 7- to 8-year-olds was 16.7. As with the yellow walk, notwithstanding relatively small sample sizes, this age effect is statistically significant (F=2241.2, d.f.=1,22, p<0.001). Again, these data support the conclusion that the walk provides sufficient challenge for this age group and is sensitive to developmental change.

3.1.4 Conclusion

Both studies support the conclusion that the parents can execute and score the walks reliably and that they provide appropriate levels of explanation and tuition in so doing. The walks provide appropriate support for parents in structuring their teaching and helping them to identify what to teach next.
3.2 Pilot study 3: Can the quiz task foster a transition to error-avoidance?

For both the yellow and the green walks there is a straightforward association between the task itself and appropriate changes in behaviour. However, the connection between the quiz task and its desired effect (transition to an error-avoidant perspective) is more theoretical. This study was designed to investigate whether using the quiz materials would foster the transition from damage- to error-avoidance.

3.2.1 Method

Sixty-one six-year-old children, approximately half boys and half girls, took part in this study. Thirty-nine of these children formed the experimental group and twenty-two formed a control group. All children were recruited through, and tested individually in, their school.

The diagnostic procedure developed by Thornton et al. (1998) for the Phase One Child Development Project was used to categorise each child as damage-avoidant, error-avoidant, or as showing the transitional ‘mixed’ pattern of responding at the outset of the study. Children in the experimental group then received two sessions of training with the quiz task, about a week apart, while the control group received no intervention. All children were then post-tested using another version of the diagnostic procedure (the version being counterbalanced across condition, age, and pre/post test). On the basis of the post-test the children were re-categorised as being damage-avoidant, error-avoidant, or showing the transitional mixed pattern of responding.

3.2.2 Results

There were no significant differences between the distributions of damage-, mixed- and error-avoidant categorisations made on the pre-test for the experimental and control groups.

The key hypothesis, that experience of the quiz task would foster the child’s transition from a damage- to an error-avoidant perspective, was tested by comparing changes in pre- and post-test categorisation on Thornton et al’s (1998) diagnostic task between the experimental and control group. For this initial analysis, nine children who scored as error-avoidant on the pre-test were excluded (since they cannot make the relevant transition). The remaining children were scored as either showing no increased awareness of error-avoidance (either remaining in their initial group or regressing from mixed-transitional to damage-avoidant) or as showing increased awareness of error avoidance (towards either a mixed-transitional or an error-avoidant response). The data are summarised in Table 3.1 (overleaf). Children who had experienced the quiz task were significantly more likely to show an increased awareness of error-avoidance than those in the control group ($X^2=10.55$, d.f.=1, $p<0.01$).
Table 3.1
The impact of the quiz on transition towards error-avoidant behaviour

<table>
<thead>
<tr>
<th>Children showing:</th>
<th>Quiz group</th>
<th>Control group</th>
</tr>
</thead>
<tbody>
<tr>
<td>No increased awareness of error-avoidance</td>
<td>14 (38.9%)</td>
<td>14 (87.5%)</td>
</tr>
<tr>
<td>Shift toward increased error-avoidance</td>
<td>22 (61.1%)</td>
<td>2 (12.5%)</td>
</tr>
<tr>
<td>Total</td>
<td>36</td>
<td>16</td>
</tr>
</tbody>
</table>

The impact of the quiz task is particularly clear among children who initially behaved in a purely damage-avoidant way. Whereas sixteen (88 per cent) of the initially damage-avoidant children in the quiz group showed an increased awareness of error-avoidant criteria, only one child (6 per cent) in the control group did so. The difference is strongly significant (X2=17.93, d.f.=1, p<0.001). Nine (25 per cent) of the children in the quiz group made the change to pure error-avoidance while only one (6 per cent) did so in the control group.

3.2.3 Conclusion

These results strongly endorse the prediction that experience with the quiz task fosters the transition from damage- to error-avoidance, at least in the hands of a researcher. The further issue of whether parents can effect such a change using these materials is addressed in Chapter 5 (page 41).

3.3 Pilot study 4: Can parents undertake the quiz task reliably?

The previous study demonstrated that, if used as intended, the quiz task could foster the transition from damage- to error-avoidance. A key issue is now whether parents can use it reliably, on the basis of the instructions in the booklet alone.

3.3.1 Method

Forty-four caregivers (all mothers) were recruited through schools in East Sussex to participate in this study, together with their children. As in earlier studies, the age of the child (5 to 6 years or 7 to 8 years) was counterbalanced across the SEG of mother (assessed on mother’s current or last occupation).

Each mother was asked to meet individually with a researcher at her child’s school. She was given pages 4, 8, 9, 10 and 11 of the booklet and asked to read through the material. The researcher explained that the study was concerned to test whether the instructions in the booklet were clear enough to be effective as they stood, and so no questions could be answered until after the test had been completed. The mother then completed one version of the quiz task with her child and observed by the researcher (with quiz version selected by the researcher to counterbalance version used, across age and gender of child and SEG of mother). The researcher made no comment on the mother’s approach, but rated the extent to which she executed the task as intended. Following completion of the task the researcher debriefed the mother, asking what she thought her child needed to learn next in the light of performance on the quiz, what she thought of the quiz procedure, and for any comments she might have. Any queries raised were then answered.
3.3.2 Results

Establishing an appropriate collaboration

A key factor in the success of the quiz task was whether or not the parent was successful in engaging the child in a discussion of the materials. This was assessed in two ways: by rating the extent to which the parent (a) attempted to provoke an interactive discussion with the child and (b) was successful in eliciting a discussion from the child.

Most parents (N=30, 68 per cent) made appropriate efforts to engage the child in discussion across all four items in the quiz task. Five parents (11 per cent) did so on three of the four pictures. Four parents (9 per cent) made appropriate efforts on two pictures, and five used the appropriate approach either only once (N=4, 9 per cent) or not at all (N=1, 2 per cent). Parents were scored as failing on this criterion if they took too didactic an approach, not allowing the child to share in the analysis of the picture.

Thus 88 per cent of the children received appropriate encouragement to engage the task on at least half the materials, and 79 per cent were appropriately encouraged on most materials. The tendency to make appropriate efforts to engage the child in discussion was significantly related to SEG; parents from lower SEGs were less likely to take this approach (F=4.01, d.f.=2, p<0.05). Even in the lowest SEGs, however, children were exposed to appropriate efforts to engage them in discussion with, on average, 70 per cent of the quiz material.

Twenty-four of the mothers (54 per cent) were successful in actually eliciting a discussion of each successive picture in the quiz with their child. A further ten (22 per cent) elicited a discussion of three of the pictures, four (9 per cent) a discussion of only two pictures, one (2 per cent) succeeded with only one picture, and one did not manage to elicit a discussion with her child at all. Overall, therefore, thirty-four (76 per cent) parents managed to elicit a discussion of at least three-quarters of the quiz materials with their child. There was no effect of age or SEG on these data.

These data suggest that most parents (77 per cent) can administer the quiz task as intended for most of the time. Only one parent failed to administer the task appropriately: she did not share any discussion with her child and persistently dominated the discussion. The success of the task depends on both the mother and the child participating appropriately. It is interesting that, whereas parental style of approach varied with SEG, children’s responsiveness to the task did not, implying that the children themselves contributed to the generation of discussion of the materials. This absence of a SEG effect on the children’s responsiveness may offset the effect in parental administration of the task.

Focusing the discussion on appropriate features

Just establishing an interactive discussion with the child is not sufficient to ensure the efficacy of the quiz task in fostering the transition to error avoidance. It is also important for the discussion to focus on relevant road safety related issues and that the parent provides an appropriate level of explanation of such issues.
Virtually all mothers (N=40, 91 per cent) focused on factors relevant to road safety across all four pictures when using these materials with their child. Two mothers (4 per cent) did so on only three of the pictures, one on only two pictures, and one never did so. There was no effect of SEG in these data. Thus even when the quizzes were taken out of the context of a road safety study, most parents pick out relevant road safety issues.

Most mothers (N=34, 77 per cent) also offered an appropriate level of explanation across all four of the pictures. Six (13 per cent) did so on three out of four pictures, two (4 per cent) explained only two pictures appropriately, one explained only one picture, and one mother never offered her child an appropriate explanation. Again, therefore, most parents (90 per cent) were able to focus on the appropriate issues and explain them adequately to their child on at least three of the four items. No effect of SEG was observed in these data.

**Parental interpretation of their child’s response**

After completing the task parents were asked to say, in the light of their child’s performance, what they thought the child needed to learn next. In 36 cases (82 per cent) the parent’s judgement of what the child needed to learn next corresponded exactly with the independent judgement made by the researcher. There was no effect of SEG in these data.

**Parental views of the quiz task**

Forty (91 per cent) of parents thought the quiz task was easy to administer and useful to do. Forty-two (96 per cent) participating children rated the quiz task as fun.

### 3.3.3 Conclusion

These data suggest that most mothers should provide their child with the appropriate experiences of the quiz task for most of the materials, and that all but a minority will do so for at least half the materials. Most could use the quiz task to structure their road safety teaching and found it useful.

### 3.4 Pilot study 5: Can parents use Thornton et al’s diagnostic task reliably?

The yellow and green walks act as both teaching devices and instruments that provide data on children’s performance/comprehension of various traffic skills and spontaneous roadside behaviour. Parents can execute these tasks effectively and reliably, so that parental ratings can play a useful role in evaluating the impact of the booklet in road safety education.

However, the booklet itself contains no measure of damage- or error-avoidance – a key variable for the present project. Initially it had been hoped that asking parents to record their child’s responses to the quiz materials could provide such a measure, but the quiz pictures were designed to optimise teaching error-avoidance not measuring it. So no clear and reliable measure of damage- or error-avoidance could be devised for these tutorial quiz
pictures. For this reason, a further pilot study was conducted in which parental reliability for using and scoring Thornton et al’s (1998) diagnostic test for damage- or error-avoidance was measured. This was renamed the “Child’s Judgement Task”. An example of this task is shown in Figure 3.1.

3.4.1 Method

Twenty-four parents (four men and twenty women) of children aged 4 to 8 years took part in this study, together with their child.

Each parent met a researcher individually at the child’s school, was given the task materials (shown in Figure 3.1), and was asked to show these pictures to the child one by one. For each picture he/she was requested to ask: “Did someone do something wrong here?” and record the child’s first response exactly as “Yes” or “No” – without providing any further influence or discussion. A researcher observed the interaction between parent and child and rated the degree to which the parent administered the task correctly (that is, without deviating from this simple procedure, prompting the child’s responses, etc.). The researcher also separately recorded the child’s first response to each picture.

Figure 3.1 One of two parallel forms of the Child’s Judgement Task
3.4.2 Results

Seventeen (71 per cent) of the parents administered the task exactly as intended, without giving any hints or prompting. A further three (12 per cent) parents asked the target question as intended and recorded the child’s response, but then discussed the picture with the child as if to prompt a different response. Of the remaining four parents, three (12 per cent) prompted the child inappropriately on one key picture; the last parent had a completely unresponsive child and had to resort to hinting to elicit any response during the experimental session.

There was a trend towards an age effect in the data, although the sample was too small for it to reach significance. Thus, whereas 50 per cent of parents testing 4-year-old children used inappropriate hints, only one parent of a 5- to 8-year-old child did so. For the age range for whom the booklet is intended, therefore, and the children on whom it will be evaluated, most parents administered the task appropriately.

No effects of SEG were apparent in these data. In relation to parental recording accuracy, the parents’ scores corresponded with those made by the experimenter in all cases.

3.4.3 Conclusions

The data suggest that parents can administer Thornton et al’s (1998) diagnostic task (the “Child’s Judgement Task”) fairly reliably. However, it is worth noting that these parents used the task under the eye of an observer and so the data cannot necessarily be taken to imply that parents will do so when using the task unobserved. Anecdotally, parents often appeared surprised by their child’s response to the pictures and were drawn into using the materials as a teaching aid, rather than simply as an assessment tool. The experimenter who collected the data believed that, had she not been present, the parents might have engaged in more prompting than was observed. Insofar as this would lead them to cover issues pertaining to the induction of error-avoidant approaches to road safety, this is no bad thing. However, it may raise issues in relation to the evaluation of children’s untutored responsiveness to error-avoidance.

An explanation for the high proportion of parents using inappropriate hints is that no rationale was given for the procedure, and no explanation of the significance of the results. From a parental viewpoint, then, the damage-avoidant child’s response is unintelligible. Such responses are likely to suggest to the parent that the child has misunderstood the task and hence are likely to elicit hinting and prompting, perhaps recording a ‘better’ response. It should be emphasised that no such drift occurred in this study, with a researcher observing. But a safeguard to reduce the likelihood of it happening when no observer is watching might be to provide parents with a rationale of the procedure of the task and a way of interpreting their child’s response. The Child’s Judgement Task was modified to do this for use in the full-scale evaluation of the booklet.
3.5 Summary

Four pilot studies have demonstrated that parents can reliably use and interpret the walks and quizzes in the booklet. In addition, the results show that the quiz task can foster the transition from damage- to error-avoidance. Parents can potentially administer and score Thornton et al’s diagnostic test reliably, so that parental scores on this test could be used in an evaluation pack.

These conclusions, of course, are constrained by the fact that, of necessity, the assessments were made on parents who were willing to donate time to the research. The effectiveness of the materials in more general use can only really be examined in a larger scale trial.
Chapter 4 A pilot evaluation of the booklet

The studies reported in Chapter 3 established that parents could reliably administer, score and interpret the walks and quizzes that form the main dynamic elements in the booklet. However, the data did not address the question of whether using the booklet will assist parents in improving their child’s skills, spontaneous roadside behaviour, or grasp of error-avoidance. This issue is addressed in the study reported in this section.

4.1 Does the booklet have an impact on the child?

The aim of this study was to test the prediction that the booklet will support parents in increasing their child’s traffic skills and habitual traffic awareness, and will foster the transition to error-avoidance. The study also tested the theoretical prediction that habitual deployment of traffic awareness will be more effectively improved in children who show an increased awareness of error-avoidance than in those who do not.

4.1.1 Method

Three hundred parents were recruited to the study by letters providing a description of the project distributed through their child’s school. These parents were distributed across schools of mixed average socio-economic group (SEG), and across urban and rural areas.

Each participating parent returned a signed consent form enrolling one child in the study. They were then sent a resource pack consisting of the booklet and three pullout sets of the yellow and green walk data sheets, each of which was identical to page 7 of the booklet. The pack contained three pre-paid postage envelopes and a covering letter explaining the project requirements. Parents were asked to use the booklet with their child through the school summer holidays. They were asked to score and return one yellow and one green walk when they began at the start of the holiday, another around the middle (that is about 3 or 4 weeks later), and the last at the end of the holiday (that is after about a further 3 or 4 weeks). They were asked to return the score sheets at the time of testing, using the envelopes supplied.

Before the packs were distributed to parents all enrolled children were tested on the Child’s Judgement Task in their schools by a researcher. Children whose parents returned all three data sheets at appropriate intervals were post-tested on the Child’s Judgement Task using an alternate version.

4.1.2 Results

Fifty-one parents (17 per cent) returned all three data sheets at intervals as requested. Data from parents who had only made one or two returns were discarded. Table 4.1 shows the age and SEG breakdown for the sample returning all three data sheets appropriately. There are no significant biases toward reporting as a function of age or gender of the target child.
Table 4.1

<table>
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<th>SEG</th>
<th>5–6 Years</th>
<th>7–8 Years</th>
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<th>Original sample</th>
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</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Male</td>
<td>Female</td>
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<td>Female</td>
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<td>1/2</td>
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<td>6</td>
<td>2</td>
<td>1</td>
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</tr>
<tr>
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<td>6</td>
<td>7</td>
<td>2</td>
<td>19</td>
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</tbody>
</table>

Also shown in Table 4.1 is the percentage of returns from within each SEG, and the proportion of the original sample from each group. As can be seen from this table, there were no significant differences in return rates between SEGs (X²=0.62, d.f.=2, p=0.7), although there was a clear difference between the SEG distributions of the original and returner samples. Clearly, parents in the SEG 1/2 were more likely to complete the task.

4.2 Hypothesis 1: Using the booklet improves children’s scores on the yellow walk (skill test)

The data support this hypothesis. Over the sample as a whole there is a clear increase in children’s scores on the yellow walk between successive returns. Scores on the second return are significantly higher than those on the first (t=–7.70, d.f.=50, p<0.001), and those for the third test are significantly higher than scores for the second (t=–3.61, d.f.=50, p<0.001). Mean scores across successive returns are shown in Table 4.2. Thus children’s competence in roadside traffic skills increased through the period in which the booklet was in use.

Table 4.2

<table>
<thead>
<tr>
<th>Yellow walk</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>27.59</td>
</tr>
<tr>
<td>Second</td>
<td>31.39</td>
</tr>
<tr>
<td>Third</td>
<td>32.90</td>
</tr>
</tbody>
</table>

These results are in line with the view that using the booklet supports parents in creating gains in their child’s basic traffic skills. However, proper support for the conclusion that the booklet creates gains over time beyond those accruing naturally in the population requires a comparison to a control group. For the purposes of this preliminary pilot study, a suitable comparison can be obtained by comparing the initial scores of the older group of children (7- to 8-year-olds) with the final scores achieved by the younger group (5- to 6-year-olds).
Overall, the mean score of 7- to 8-year-olds when entering this study was 28, while the mean final score of the 5- to 6-year-olds was 33. Thus the 5- to 6-year-olds completing the scheme outperformed the untrained 7- to 8-year-olds entering it. The effect is significant (t=2.74, d.f.=49, p<0.01). These data support the conclusion that using the booklet creates more gains in traffic skill than would occur naturally over time.

There is a significant age effect in these data, with younger children showing greater gains than older children (F=3.58, d.f.= 3, p<0.05). These data are summarised in Table 4.3. There is no effect of either SEG (F=1.3, d.f.=2, p=0.29) or of gender (F=1.1, d.f.=1, p=0.29) and there are no interaction effects.

Table 4.3
The effect of age on yellow walk scores

<table>
<thead>
<tr>
<th>Age</th>
<th>% change on yellow walk scores</th>
<th>Standard deviation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age 5 years</td>
<td>40.9</td>
<td>36.7</td>
</tr>
<tr>
<td>Age 6 years</td>
<td>17.8</td>
<td>12.9</td>
</tr>
<tr>
<td>Age 7 years</td>
<td>19.8</td>
<td>14.8</td>
</tr>
<tr>
<td>Age 8 years</td>
<td>15.0</td>
<td>11.1</td>
</tr>
</tbody>
</table>

4.3 Hypothesis 2: Using the booklet improves children’s scores on the green walk (spontaneous traffic awareness)

As with the yellow walk, the data support this hypothesis. Over the sample as a whole there is a clear increase in children’s green walk scores between successive returns. Scores on the second return are significantly higher than those on the first (t=–5.26, d.f.= 50, p<0.001); the third test scores are significantly higher than those for the second (t=–4.98, d.f.=50, p<0.001). Mean scores across successive returns are shown in Table 4.4.

Table 4.4
Mean scores on the green walk for successive trials

<table>
<thead>
<tr>
<th>Green walk</th>
<th>Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>First</td>
<td>16.04</td>
</tr>
<tr>
<td>Second</td>
<td>18.02</td>
</tr>
<tr>
<td>Third</td>
<td>19.10</td>
</tr>
</tbody>
</table>

Thus children’s spontaneous traffic awareness increased significantly through the period in which the booklet was in use.

These results are in line with the view that using the booklet supports parents in improving their child’s spontaneous roadside behaviour. As with the yellow walk scores, however, these results need to be compared with control group data. Overall, the mean score of 7- to 8-year-olds entering this study was 16.4. The mean final score of the 5- to 6-year-olds was 18.8. Again, the younger children completing the training outperformed the older children entering the scheme. The difference is significant (t=3.2, d.f.=49, p<0.005).
Improvement on the green walk was not significantly related to age, SEG, or gender. There were no interaction effects.

4.4 Hypothesis 3: The booklet helps to foster a transition from a damage- to an error-avoidant perspective

The data support the hypothesis that parents using the quiz materials were successful in fostering an increased awareness of error-avoidance in children who were purely damage-avoidant at the outset of the study. Half of such children showed an increased awareness of error avoidance on post-test. The mean age of children initially scored as purely damage-avoidant was 5.8 years, closely comparable to (in fact a little younger than) the group forming the control group in Study 5. Comparing the rates of change toward increased sensitivity to error-avoidance in the children initially categorised as damage-avoidant in this study and those so categorised in the control group in Study 5 shows that children whose parents used the booklet were significantly more likely to develop increased awareness of error-avoidance than those in that control group (X²=4.37, d.f.=1, p<0.05).

However, it is clear that parents are less effective in generating error-avoidance than a trained researcher. Thus, whereas 8 of the 16 initially damage-avoidant children made this transition in this parent-as-a-tutor study, 16 of the 18 comparable children did so in the researcher-led study. Although the difference is significant (X²=19.52, d.f.=1, p<0.001) it is difficult to interpret. It may reflect poorer administration or even omission of the quiz task by some parents. However, the fact that there was an increased awareness of error-avoidance in 50 per cent of the children eligible to make such a shift supports the conclusion that the materials in the booklet can have a significant impact in fostering error-avoidance in the general population.

There were no age, gender or SEG effects in these data.

4.5 Hypothesis 4: Change in spontaneous traffic awareness is related to an increase in the child’s awareness of an error-avoidant perspective rather than to gains in traffic skill competence

The presumption underlying much skills training in road safety is that increments in children’s competence in executing and comprehending road traffic skills will translate into changes in spontaneous (that is uncued) behaviour at the roadside. The data obtained here do not support this hypothesis. The green walk scores (that is spontaneous, uncued traffic awareness) were not significantly different from children who showed above versus below median gain in scores on the yellow walk (that is traffic skill competence and comprehension) (t=0.89, d.f.=49, p=0.37).

Obviously, this result does not challenge the need to teach children road traffic skills; a child cannot be expected to use a skill or comprehension which he or she does not possess. Teaching road traffic skills and comprehension must remain a key priority. But the result does support the contention that teaching such skills is not enough on its own to induce safer roadside behaviour.
Furthermore, the data support Thornton et al’s (1998) theoretical analysis suggesting that enhancing the child’s competence and comprehension of specific traffic skills will not necessarily foster an increase in error-avoidance. As predicted, there is no significant relationship between improvement in scores on the yellow walk and the transition from damage- to error-avoidance. In these data, children show marked changes in their performance and comprehension of traffic skills when cued to think about road safety, without showing an increased awareness of error-avoidant criteria in reasoning about road safety.

The data support the thesis that an increasingly error-avoidant perspective mediates the spontaneous deployment of traffic awareness. There is a significant relationship between improvement in scores on the green walk and the transition to a greater sensitivity to error-avoidance. Children who showed a shift towards error-avoidant criteria made significantly more gains in scores on the green walk than those who showed no such increase (t=1.72, d.f.=14, p<0.05). Whereas children who shifted toward an error-avoidant approach showed an average improvement of 36 per cent on their green walk scores, those who showed no such shift showed an average improvement of only 17 percentage points. These are the first reported data supporting the prediction that fostering the transition toward an error-avoidant approach will enhance the probability of the child actually using traffic skills at the roadside.

4.6 Summary

This study supports the conclusion that parents using the booklet will induce improvements in the level of their child’s competence and comprehension of basic traffic skills. There are improvements in both spontaneous traffic-awareness and the child’s understanding of error-avoidance as a principle in road safety. The data also support the contention that including procedures to foster the transition to error-avoidance enhances the impact of road safety education, by increasing the probability of the child spontaneously reacting to potential traffic hazards when not cued to do so. These conclusions offer justification for the mounting of a large-scale evaluation of the booklet, described in the following sections of this report.
Chapter 5 An initial investigation of the booklet in use

A survey carried out in May 2000 was designed to evaluate the booklet and scheme and to test the feasibility of distributing scheme materials along with data sheets for parents to complete and return with no external intervention. The purpose of this procedure was to mimic the proposed modus operandum of the booklet in use, as discussed in the previous chapter. This involved the distribution of materials to parents who were not specifically recruited to the scheme and for there to be no contact with the project team or other agencies during evaluation of the scheme.

5.1 Method

Seventy schools of mixed socio-economic group (SEG), and across urban and rural areas, were identified by Road Safety Officers (RSOs) across the four counties of Herefordshire, Kent, West Sussex and Worcestershire. The child population represented by schools in each county accounted for approximately 10 per cent of the target age group in that area. The Head Teachers who had been approached by the RSOs provided the researchers with lists of pupil names (and dates of birth) from which 9,439 named packs were distributed back to the schools to be taken home by the children. Parents were asked to complete the ‘response forms’ (which were actually composed of an agreement to participate and questions relating to demographic information) and to return them to the researchers via the school. Of the original 9,439 packs distributed, 75 parents completed the full activities contained in the booklet (second Child’s Judgement Task and third yellow/green walk). Again, the completed material was returned to the researchers via the schools.

The distribution across counties of parents who were approached, who responded, and who actually completed the scheme, is shown in Table 5.1.

<table>
<thead>
<tr>
<th>County</th>
<th>Approached</th>
<th>Responded</th>
<th>Completed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Herefordshire</td>
<td>549</td>
<td>32</td>
<td>5</td>
</tr>
<tr>
<td>Kent</td>
<td>4741</td>
<td>243</td>
<td>28</td>
</tr>
<tr>
<td>West Sussex</td>
<td>2283</td>
<td>166</td>
<td>30</td>
</tr>
<tr>
<td>Worcestershire</td>
<td>1866</td>
<td>58</td>
<td>12</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>9439</strong></td>
<td><strong>499</strong></td>
<td><strong>75</strong></td>
</tr>
</tbody>
</table>

The evaluation procedure was designed to mirror as closely as possible the ‘real life’ operation of the scheme whereby copies of the booklet would be made available to parents in such locations as schools, libraries, etc., without any opportunities for ‘opting in’. Thus each parent was sent a resource pack, totally unsolicited and distributed through the child’s school, labelled with the target child’s name and school. RSOs delivered sets of materials to each school, and the schools distributed them to the named children who took them home.
Packs were distributed in mid May and the study was conducted over the summer term. This offered long daylight hours and reasonably good weather for carrying out the associated activities. Start and end dates between schools were staggered to allow for the logistic demand of delivering materials to a large number of schools. This also acted as a further control on extraneous events occurring during the period of the trial inadvertently affecting the results.

Each pack contained:

- A covering letter providing a description of the project and an invitation to participate. The letter also explained the project requirements.

- An enrolment (response) form for indicating agreement to participate. Parents were also asked to provide background information on the occupations of both parents, whether their residence was in an urban or rural area, and the age and gender of the child to be enrolled in the project.

- The booklet under evaluation.

- Three pull out sets of the yellow and green walk data sheets, each of which was identical to page 7 of the booklet.

- Two versions, labelled A and B, of the Child’s Judgement Task. In half of the packs version A was labelled first and version B last. In the other half the order was reversed.

- A sheet describing the Child’s Judgement Task and how to score it. It also explained the possible patterns of response and their interpretation for assessing the child’s understanding of the need to keep safe in traffic.

- A feedback questionnaire which asked parents for their comments on the booklet and their experience using it, as well as their general concerns about road safety.

- for returning the data sheets, response form and questionnaire (via the school).

The trial procedure was fully explained in the covering letter. Participating families were asked to complete their enrolment form and to make a preliminary assessment of their child on one of the pull-out yellow and green walk pages, and on one version of the Child’s Judgement Task (labelled ‘first’). They were then asked to return these to the project.

Parents were asked to use the booklet to teach road safety to their child, frequently using the walks and quizzes. They were not asked to adhere to any participant timetable but to retest the child on the second detachable yellow and green walks after about four weeks of using the booklet, and to return the scored sheet to the project. A third assessment on the yellow and green walks, and a second assessment on the Child’s Judgement Task (labelled ‘last’), was to be made after a further period of about four weeks (that is after using the booklet for about two months). Parents were asked to return the scored sheets to the project, along with the debriefing questionnaire. Returns were collected through the child’s school.
To encourage the return of completed quizzes, schools participating in the scheme were offered an incentive. The school providing the highest percentage of children returning full data sets would win a personal computer.

5.2 Results

As shown in Table 5.1 above, of the parents approached only 499 (5.3 per cent) returned their response form. Of these, just 75 (0.8 per cent of the material distributed) returned all three data sets at intervals as requested.

A significant effect of region on both response to and completion of the scheme was obtained. The returns point to a lower than expected rate of response for Worcester, and a higher than expected rate of response (X²=36.32, d.f.=3, p<0.001) and completion for West Sussex. There was a lower than expected rate of completion for Kent (X²=9.94, d.f.=3, p<0.05). These effects were not attributable to either SEG or to the urban/rural location of residence of families in these regions. No effect of age or gender on completion of the scheme was found.

5.3 Survey feedback and implications

The response rate for completion was extremely disappointing in the light of the reasonable response (17 per cent) to the pilot study of the booklet in operation and the raised expectations based on the inducement of the computer prize. Some indications as to why the returns were so low may be gleaned from feedback obtained from parents who took part in the scheme, from an additional survey undertaken of head teachers, and from debriefing the RSOs who selected schools and distributed the material.

5.3.1 Parental feedback

An important aim of the scheme was that it should be usable, and be perceived as useful, to the parents who will be involved in its deployment. As a part of the project design, opinions were solicited from parents.

The questionnaire circulated to parents as a part of the material pack was divided into three parts. The first contained open-ended questions that asked parents for their overall views on the booklet and its activities, and then asked them to say what was the best and worst thing about it. The second part of the questionnaire presented parents with rating scales regarding the booklet, activities, and road safety. The third part of the questionnaire asked parents for their views on the causes of traffic danger and ways of reducing this for their child. It ended by asking parents for their views on how the scheme could be improved.

A total of 148 (2 per cent) parents returned their form, of which 75 had fully completed the scheme. However, no significant impacts were observed. Nine parents expressed a difficulty in interpreting the pictures of the Child’s Judgement Task, and others (N=5) were concerned with the print size used in the booklet.


**Booklet content**

A number of parents expressed the view that one of the best things about the booklet was its content, in particular in raising awareness of road safety issues (N=30) and improving discussion of about road safety issues with their child (N=68). Parents valued being able to assess their child’s awareness of the danger posed by road traffic. Some parents, however, found the booklet difficult to understand. Suggestions for improvements to the scheme were essentially to make it more widely available, although a number of parents also suggested combining it with some means of making it more attractive to young children – perhaps through a child’s activity book.

**Booklet design and activities**

Many parents felt that the booklet was easy to follow with good explanations, and the activities were interesting, enjoyable and easy to do. Parents from lower SEGs (SEG being defined for the following analyses as having manual/non manual occupations) were more likely to rate the leaflet as being easy to use than parents from higher SEGs (X²=16.35, d.f.=3, p<0.001). Parents liked the Child’s Judgement Task (N=19) especially the pictures (N=19). However, just as many expressed the view that the pictures were unclear and some parents felt that the booklet was too small, contained too much detail, and would benefit from clearer examples.

Parents from higher SEGs were significantly more likely to express views on difficulties in interpreting the Child’s Judgement Task pictures (X²=6.79, d.f.=1, p<0.001) and to suggest making improvements to this aspect of the scheme (X²=5.53, d.f.=1, p<0.05). Overall, these comments suggest that parents find the activity enjoyable, liking the way in which the pictures feature in this task, but would prefer that the scenes depicted were perhaps less ambiguous or perhaps graphically more sophisticated.

An important viewpoint emerged regarding the need to address the applicability of activities for rural communities. Parents expressing this view were significantly more likely to reside in a rural, rather than an urban, location (X²=0.006, d.f.=1, p<0.001).

**Scheme improvements**

Ninety three per cent of parents suggested some improvements to the scheme. The predominant viewpoint was a very clear “need to provide regular road safety tuition” (N=28) and for this to be “available on a much wider scale to everyone” (N=19). Other views reflected issues raised by previous questions, such as the “need to make activities more relevant to rural areas” for predominantly rural communities (N=11), and “improving the clarity of pictures” for the Child’s Judgement Task and the print size used in the booklet (N=10).
Traffic danger and child safety

Ninety-two per cent of respondents felt that traffic poses a danger to their children. These views were not substantially changed as a result of the scheme, however. Thus 93 per cent of the parents who responded suggested that they worry about the danger ‘about the same’ or ‘more’ as a result of participating.

Most parents (N=108) thought that excessive speed and lack of care by drivers posed a threat to their children, coupled with the child’s lack of awareness of road safety issues. Many also felt that a lack of safe pedestrian crossing areas exacerbated this problem (N=17). However, many parents also highlighted the child’s own lack of awareness and understanding of road safety issues (N=69).

Ninety-four per cent of parents commented on how they felt the road danger to children could be reduced. Many felt that much could be done to improve children’s road safety education (N=84), although some felt it was the drivers who should be educated (N=17). Many parents also felt that more could be done to improve traffic and the dangers it poses in residential and school areas (N=75), perhaps in conjunction with an overall move to reduce car usage (N=10).

An important aim of the booklet was that it should raise awareness about road safety issues and offer parents a practical means of assessing their child’s ability to understand the hazard posed by traffic. It is interesting to note that a number of parents spontaneously comment on these aspects as positive outcomes of the scheme. Predominantly, the views expressed by parents suggest that they liked the booklet and the activities.

Another aspect of this spontaneous commentary highlights the problematic nature of completing and returning the sequence of activities required for evaluation of the scheme, however. Thus parents also highlighted difficulties in completing activities for families residing in rural locations, in that the activities for assessing the child’s skills required a more urban setting.

Unfortunately the low response rate to this survey, and even lower completion rate, is not easily explained by these feedback data. Thus the analysis yielded no factor that was instrumental in distinguishing between parents from these two groups. For example, although parents residing in rural locations were significantly more likely to be critical of the appropriateness of the activities for rural communities, there was no corresponding difference in response or completion rate for families from these communities.

On the other hand, difficulties encountered in the data collection aspects of the study played a clear part in whether the scheme was well received. The extent to which this accounted for the low completion rate could only be a matter for conjecture, although similar kinds of issues were raised by Head Teachers in the follow-up survey described in Section 5.3.2 below.
5.3.2 School feedback

Feedback from parents indicated relatively few concerns with the scheme as such. Rather, problems were expressed more about the scheme’s organisation and the procedures for collecting the data. To investigate the extent to which distribution and administration posed a problem for the scheme, questionnaires were sent to the Head Teachers of all 70 schools that had taken part in the May 2000 survey. These were distributed on 23 February 2001. Each pack contained a covering letter (addressed to the Head Teacher), the questionnaire, and a pre-paid return envelope.

Twenty-six per cent (37 per cent) replies were received within three weeks. There were no significant differences between counties in the rates of return. Table 5.2 indicates the return rate from the four counties involved.

Table 5.2

<table>
<thead>
<tr>
<th>County</th>
<th>Sent (N)</th>
<th>Returned N (%)</th>
<th>Response time (days)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Herefordshire</td>
<td>9</td>
<td>4 (44%)</td>
<td>10</td>
</tr>
<tr>
<td>Kent</td>
<td>29</td>
<td>10 (35%)</td>
<td>10</td>
</tr>
<tr>
<td>West Sussex</td>
<td>16</td>
<td>7 (27%)</td>
<td>7</td>
</tr>
<tr>
<td>Worcestershire</td>
<td>16</td>
<td>5 (19%)</td>
<td>11</td>
</tr>
<tr>
<td>Total</td>
<td>70</td>
<td>26 (37%)</td>
<td>9</td>
</tr>
</tbody>
</table>

The feedback from the schools shows that the process of distribution and collection of materials went according to instructions. Very few problems were reported, although there was some suggestion of parental and teacher resistance to operating the scheme. The schools confirmed that they gave only limited support to the parents (which might be changed in a future scheme by both involving the schools more and getting them to be more enthusiastic about the scheme, and by allowing more time for the scheme to run and more resources to follow up the schools’ involvement in the scheme).

Distribution of packs from University of Sussex to schools

The results suggest that the distribution of packs to schools was effective. Of the Head Teachers who could remember, ten indicated that the packs were received in the schools in May and five in the spring. Packs were remembered to have been brought to the school by RSOs and the Sussex researcher, and received by the Head or Deputy Head (9) or another administrative person (17).

Distribution of packs by schools to the children

Distribution of the packs seemed to be reasonable. Instructions for distribution were clear to all but two of the schools and 14 Head Teachers could remember how the distribution was effected. Packs were distributed within a week (6) or in May or June (8). All packs received by the schools were distributed to the named children and no packs were left in any of the
schools. All but two of the schools knew whom to contact for help, although most (23) did not seek advice.

**Collection and return of replies**

Most schools (21) followed the suggested procedure for collection and return of replies; no replies were left in any of the schools. Most schools (21) encouraged participation in some way and 4 schools displayed a poster. Four gave ‘verbal’ reminders to the children and 15 schools reminded parents through a newsletter. All schools reported that no parent had queried the scheme, or complained about it.

**Computer prize**

The computer prize appeared not to have been an effective inducement. Only 12 of the schools claimed to know about the computer prize offered to the school with the greatest percentage of complete returns. Eleven schools claimed that they did not know about it, and three Head Teachers could not remember. This is disappointing. Some of the RSOs told schools about the prize at the time they were recruiting them into the survey and all schools were told about the prize in a letter from the project at the outset of the scheme. A further reminder letter and posters were sent to all schools prior to the competition closing date. However, the lack of awareness of the computer prize alone does not fully explain the low response to the survey. If this were the case, one might expect to see a marked variation in response between schools that were aware of the prize and those that were not. This did not occur.

**Administrative and scheme-based issues**

Some schools provided general comments that highlight issues pertaining to how the scheme was organised and its potential impact on schools and the parents. These are reported, verbatim, below and illustrate some underlying concerns relating to parental opinion/understanding, and school pressures:

- “Although comprehensive, the scheme appeared far too complex to implement for parents. Only the very ‘dedicated’ would have the commitment or time to follow the programme.” (School 5: Herefordshire, rural, upper SEGs.)

- “Many of our parents found it difficult to understand as so many of them are illiterate themselves!” (School 26: Kent, urban, lower SEGs.)

- “The parents found some of the tasks difficult to carry out due to the road layout in our village. This possibly resulted in the disappointing response.” (School 34: Kent, rural, upper SEGs.)

- “Parents felt that there was a lot of information to complete. As explained to your office at the time, there were numerous different projects going on. It was just another form-requirement so many parents did not bother!” (School 68: Worcestershire, urban, lower SEGs.)
• “I was surprised by the poor overall response from what is normally a very supportive parent group. I can only assume that instructions for parents were unclear or that future surveys should be more closely identified with the school.” (School 59: Worcestershire, urban, upper SEGs.)

• “Teachers did not receive packs, named packs were not always correct. Teachers felt excluded from the process.” (School 17: Kent, rural, lower SEGs.)

• “Bearing in mind curriculum priorities this initiative is very time consuming for all staff.” (School 28: Kent, urban, lower SEGs.)

5.3.3 Road Safety Officer follow-up

In January 2001, debriefing sessions were held with RSOs who had participated from four counties involved in the survey. Issues discussed included the method of school and child recruitment, and of distribution and follow-up. The following is a summary of the general comments made by the RSOs in the four counties.

Parental support/willingness

• The materials in parent packs were too many, too complex, too time consuming, and disorganised, so would put parents off before they started.

• Parents in general are apathetic and reluctant to take part in any such activity.

• The amount of work being asked of parents was far too much and parents were unlikely to do it.

School support/willingness

• More time should have been given to preparatory stages, before packs were sent out to parents. To inform schools better about the scheme, to get them enthusiastic, to give them opportunity to warn parents that the scheme would take place and get them enthusiastic. This could have been done by letters, RSOs meeting parents during parents’ evening, etc.

• More could have been done during the recruitment phase – perhaps visiting each Head Teacher and showing them the materials so that they were better informed about what the parents had to do, and so would encourage parents.

• Reminders to schools might have been useful, but they had too few people to take on such work. If schools had been reminded, they could have then reminded parents which could have helped.
• The schools should have been more involved in administering the scheme – chasing-up parents etc; but this could only be done if a person in each school is made a dedicated agent, and probably paid for this from the project’s funds.

• More should have been done with the schools, perhaps using visits to keep them interested in the scheme, so the schools could remind children (in assemblies) or sent out reminder letters to parents.

• The schools agreed readily to take part because they were assured that they would not have to do very much.

• Schools have no time to give to extra-curricular activities and are reluctant to take part in anything that makes time demands on them.

• The scheme coincides with SATS.

• Some schools refused to give out names of children without parental consent. (So, on 15 May 2000 schools sent out letters to parents of all targeted children giving the opportunity to refuse to participate.)

The scheme and booklet

• Procedures should be changed but the booklet should be retained and used again.

• The booklet is far too ‘urban’ in general. The walks rely on urban setting and many Herefordshire families would have to drive to town to complete them.

Incentives

• The computer prize was not very useful; parents would feel that the odds were too long to bother. Also this prize was not personal, and parents might not care about what the school gains. This is particularly so in large schools, as opposed to small village schools where parents are more intimately involved.

5.4 Summary

Unfortunately, this survey was unsuccessful in producing a sufficiently large sample to undertake any reasonable analyses of the success and effectiveness of the booklet and scheme. However, analysis of the follow-up data from parents who completed the task, from schools that participated, and from RSOs who provided most of the interface between the research team and the schools, suggests that the relative failure was neither due to the booklet itself nor to the basic thesis of the scheme. In general, both parents and RSOs reported that they were satisfied with the booklet, its content, direction and quality.
Concerns were expressed about the load that the scheme placed on parents and schools (particularly during the scholastic exam term) and the extent to which schools (and thus, by extension, parents) were sufficiently involved to ensure a reasonable return rate of the assessment material. Indeed, recording uptake in terms of parental returns will inevitably underestimate the implementation of the scheme since it fails to include families that, for whatever reason, took up the scheme but did not return completed activity sheets. Nevertheless, both Head Teachers and RSOs felt that the scheme, *in toto*, might have been too daunting or arduous for some families. They certainly felt that the additional burden placed on schools and school timetables was more than anticipated.

The failure of the incentive of a computer prize is both surprising and disappointing. Some of the RSOs told schools about the prize at the time they were recruiting them into the survey and all schools were told about the prize in a letter from the project at the outset of the scheme. A further reminder letter and posters were sent to all schools prior to the competition closing date. However, the lack of awareness of the computer prize alone does not fully explain the low response to the survey. If this were the case, one might expect to see a marked variation in response between schools that were aware of the prize and those that were not. This did not occur, probably for the reason extemporised by one RSO – the prize was ‘cognitively’ too distant from the activities for it to make an impact.

In summary, four significant issues arise from the follow-up data of this survey:

- **Lack of opportunity for parental decision-making.** To mimic the circumstances in which parents would eventually interact with the scheme, in this survey there was no concept of parents ‘opting in’ or ‘opting out’ (as was the case in the pilot studies). The survey was designed so that parents and children from a wide range of backgrounds would receive, and have the opportunity to view, the booklet and its contents. The proportion of families subsequently taking part was then to be a measure of its appeal. At the same time, however, by not being given the chance to decide whether or not to participate, parents who eventually decided to do so did not have the same ‘ego involvement’ as they would have had had they been given the choice.

- **Lack of temporal structure.** Again, to mimic the ‘natural’ circumstances, parents were not required to return assessment material within specified time limits. They were simply asked to undertake the tasks at rough intervals and return the data when completed. The lack of structure could well have led to many parents not realising the (experimental) need for rigour and maybe even simply forgetting to complete the assessment activities.

- **Participant workload/commitment.** The follow-up results clearly suggest that both the parents’ and the schools’ workload was increased significantly by the scheme. For example, parents had to decide when and where to undertake the activities, as well as understand the details of the work. Schools had their workload increased in identifying and distributing material during a particularly busy time and in retrospect there appears to have been insufficient support, particularly prior to the schools receiving the materials for distribution. Thus the schools did not have sight of the material before receiving it for
distribution (because of various administrative problems) and some teachers reported feeling alienated from the research because of this.

- **Child support/incentive.** None was given, again because of the scheme’s thesis of requiring a naturalistic environment for assessment. The impact of the computer prize would be directed only to schools (and even this was not effective), and the importance of motivating the children sufficiently to ease the additional parental burden was not anticipated.
Chapter 6 Main evaluation of the booklet in use

Following the lack of response to the large-scale distribution of materials in the survey undertaken in May 2000, a second survey was carried out in September 2000 with some significant changes to the administrative aspects of the work, though not to the materials themselves. The changes were made in response to the issues raised during the follow-up phase of the May survey and largely concerned the administration of the data collection and the nature in which parents were recruited to the scheme.

6.1 Method

The relatively low response rate from Herefordshire and Worcestershire parents suggested the need to concentrate resources in specific geographical areas. Thus 29 schools of mixed socio-economic group (SEG), none of which had taken part in previous studies, and across urban and rural areas, were identified by Road Safety Officers (RSOs) in Kent and West Sussex. The child population represented by the schools in each county accounted for approximately 7 per cent of the target age group in that area. 5,091 children were identified by schools as falling between the target ages of 5 to 8 years.

The changes made to the administration to accommodate findings from the May survey were as follows:

- **Lack of opportunity for parental decision-making.** Parents were given the chance to ‘opt-in’ to the survey. The parents of each child were contacted prior to participating in the study. Each was sent an invitation to participate in the survey, which briefly described the survey and the incentive scheme of stickers and certificate for their child on its completion. Interested parents responded by completing a signed reply slip with their child’s name, class and school, confirming their willingness to participate.

- **Lack of temporal structure.** The covering letter provided clear milestone dates for the activities and return of material. Reminder letters were sent just prior to deadlines to parents who had opted in but who had failed to return material, and the initial pack provided parents with a checklist of deadlines and what to do when. Finally, follow-up letters were sent to parents who failed to meet the final deadline.

- **Participant workload/commitment.** The checklist described above was designed also to reduce some aspects of parental workload. Parental workload was also reduced by splitting the material over two packs, enabling parents to focus on just the set of materials to be completed for the appropriate stage of the scheme. This method had the added benefit of ensuring that parents did not confuse which Child’s Judgement Task to complete and return first, or complete activity task sheets within too short a period of time of each other. The arrival of the second pack of materials also then served the added purpose of reminding parents that it was time to carry out the final set of activities. School involvement was strengthened by a member of the research team talking personally to each Head Teacher and ensuring that significant members of staff (to the
scheme) were ‘on board’. Teachers had sight of the material well before being asked to endorse it through distribution. The timing of the survey (late autumn/early winter) ensured that the busy scholastic periods were not compromised.

- **Child support/incentive.** As a direct appeal to the children, stickers and certificates were presented to successful participants.

As in May, each participating family was sent an initial resource pack distributed through their child’s school. Each pack was labelled with the target child’s name and school. A member of the research team delivered sets of materials to each participating school (rather than RSOs as in May), and the schools then distributed these to the named children who took them home. The initial pack contained:

- a covering letter providing a description of the project and the project requirements, as well as reminding parents that their child would receive stickers for each stage of the scheme completed;

- a response form for providing background information on the occupations of both parents, whether their residence is in an urban or rural area, and the age and gender of the child taking part in the project;

- the booklet under evaluation;

- two pull-out sets of the yellow (traffic skills and comprehension) and green (spontaneous traffic awareness) walk activity sheets, each of which was identical to page 7 of the booklet;

- the Child’s Judgement Task (error-avoidance) comes in two alternative versions, labelled A and B. Each materials pack contained one version that was labelled ‘first’ – half of the sample received version A for first use and the remainder received version B;

- a sheet describing the Child’s Judgement Task and how to score it. The sheet also explained the possible patterns of response and their interpretation for assessing their child’s understanding of the need to keep safe in traffic;

- envelopes for the return of data sheets and response forms (via the school); and

- a checklist (for the entire survey) reminding parents of deadlines for returning activity task sheets and exactly what to return in each envelope.

Parents were asked to use the leaflet to teach road safety to their child, using the walks and quizzes. They were asked to retest their child after about four weeks, using the second pull-out section of the yellow and green walks, and to return the scored sheet by the deadline.
A week before the first deadline parents were sent a reminder letter, distributed via schools, urging them to complete the activities and return sheets in time for this deadline. Approaching the second deadline, parents were sent the final pack of materials. This contained:

- a covering letter asking parents to complete the final stage of the survey and again reminding them of the incentive scheme;
- a final pull-out set of the yellow and green walk activity sheets, each of which was identical to page 7 of the leaflet;
- the unseen version of the Child's Judgement Task, labelled ‘last’. Half of the sample received version B for second use and the remainder received version A;
- a feedback questionnaire that asked parents to comment on the leaflet and activities, their experiences completing the scheme, and general concerns about road safety;
- an envelope to return the data sheets and questionnaire (via the school); and
- stickers as reward for completing the previous stages of the survey.

Parents were asked to make a third assessment of their child on the yellow and green walks and a second assessment on the Child's Judgement Task by the deadline (that is after approximately two months), and to return the scored sheets to their child's school. They were also asked to return the feedback questionnaire.

A week before the third and final deadline parents were sent a reminder letter, distributed via schools, urging them to complete the activities and return sheets on time. Participating schools were asked to display a poster reminding parents of the deadline and encouraged to remind parents and children in their newsletters and assemblies.

**Timing of the trial**

The study was conducted over the autumn term, which offers the longest period of continuous term time in which to carry out the survey, but which had the disadvantage of short daylight hours and poor weather for carrying out the associated activities. In practice, it coincided with a period of severe flooding in the regions taking part, with some of the worst weather officially on record.

**6.2 The sample**

1,925 parents (38 per cent of those originally identified) agreed to participate, of which 1,027 (53 per cent of agreeing participants) returned a response form along with their first set of completed activities. The return rate for parents returning all three data sets at the intervals requested was 27 per cent of agreeing participants, yielding a sample of 521 complete data sets.
Table 6.1 shows the breakdown by region for the sample of families invited to participate. The residential type and occupational status of these families is estimated from the designation of school location and primary SEG by RSOs for the region. The sample population was representative of location and SEG of schools for each region.

The table also shows the number and percentage of families approached who agreed to participate, and the smaller number and percentage of families agreeing to take part (respondents) that partially and fully completed the scheme. These returns are particularly good when viewed in the context of the extremely adverse weather conditions experienced in the counties at the time (severe storms in October–December 2000).

Table 6.1
Regional variation in agreement to participate, partial and full completion of the scheme

<table>
<thead>
<tr>
<th>County</th>
<th>Approached</th>
<th>Agreed to participate¹</th>
<th>Completers²</th>
<th>Non completers²</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Partial</td>
<td>Full</td>
</tr>
<tr>
<td>Kent</td>
<td>2955</td>
<td>1055 (35.7%)</td>
<td>207 (19.6%)</td>
<td>305 (28.9%)</td>
</tr>
<tr>
<td>West Sussex</td>
<td>2136</td>
<td>870 (40.7%)</td>
<td>299 (34.4%)</td>
<td>216 (24.8%)</td>
</tr>
<tr>
<td>Total</td>
<td>5091</td>
<td>1925 (37.8%)</td>
<td>506 (26.3%)</td>
<td>521 (27.1%)</td>
</tr>
</tbody>
</table>

1 Percentage of those approached  ² Percentage of respondents

There was a higher rate of response from families in West Sussex ($\chi^2(1) = 13.3, p<0.001$). However, there was no significant regional variation in numbers completing the scheme. Of families asked whether they wished to participate in the survey, a higher percentage from higher SEGs (39 per cent) agreed to take part than did families from lower SEGs (34 per cent) ($\chi^2(1) = 12.4, p<0.001$). The data also show that, of families asked whether they wished to participate in the survey, a higher percentage of families residing in urban areas (39 per cent) agreed to take part than did families residing in rural areas (35 per cent) ($\chi^2(1) = 5.84, p<0.05$). These results are in line with the view that there is an effect of both SEG and location of residence on electing to take part in road safety schemes and/or surveys. Of families completing the scheme, the results show a larger proportion of families from higher SEGs (29 per cent) completed than families from lower SEGs (23 per cent) ($\chi^2(1) = 1.10, p<0.05$). There was no effect of location on completion of the scheme.
6.3 Summary

A primary goal of the full-scale survey was to evaluate the uptake of the scheme presented in the booklet. A further goal was to estimate the deterrent effects of taking part in research projects on willingness to participate. 62 per cent of parents invited to participate in the scheme did not reply: either because they did not wish to take part in a study concerning traffic skills, or for some other reason. This could suggest that parents are typically not interested in traffic schemes. Thus, in this survey (as opposed to the May survey), parents were asked whether they wished to participate before they were sent any materials. So their reason for not participating could not be that they did not like the scheme, could not understand it, found it too time consuming, or whatever – they had not seen any scheme materials to reject on this basis. This implies that their reasons for not participating reflect a general lack of desire, for whatever reason (family pressures, dislike of surveys, lack of awareness of traffic danger), to participate in a study of traffic skills. This observation is obviously of interest for all traffic education programmes.

Of the families that did agree to participate, the return of activity sheets provides a measure of interest in the scheme and usage. In this respect over half of those who initially agreed to take part clearly used the scheme. This is an extremely encouraging result, and a clear lesson for the future.

The main findings of this survey are reported in the following chapters.
Chapter 7 Developmental changes in children’s traffic skills in the general population

Eventually, most children become safe pedestrian road users, deploying traffic skills effectively and demonstrating an awareness of traffic danger. Learning of this kind, outside formal road safety training programmes, corresponds to the ‘natural’ acquisition of skills. But when do children begin to show signs of understanding safe road use? Are boys any different to girls, and does it make a difference whether children live in the town or country?

The analysis presented in this section uses the data set provided by the first returns from families before using the scheme. The first data sheet returns offer unique opportunities for characterising naturally occurring developmental changes in levels of traffic skill (yellow walk) and uncued traffic awareness (green walk) in the 5- to 8-year-old child population. Each of the measures of these two variables can be deconstructed according to socio-economic group (SEG), region and location of residence, age and gender of child, the sequence in which particular items on each test are mastered in the general population prior to this intervention (for example, whether choosing safe moments to cross a road develops before, after or at the same time as choosing safe places to cross).

Table 7.1 shows the age and gender distribution for the sample of 1,027 children who either partially or fully completed the scheme. None of the children had received any formal road safety training.

### Table 7.1

<table>
<thead>
<tr>
<th></th>
<th>Partial completers</th>
<th>Completers</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Boys</td>
<td>Girls</td>
</tr>
<tr>
<td>Under 5</td>
<td>20</td>
<td>21</td>
</tr>
<tr>
<td>Age 5–6</td>
<td>87</td>
<td>89</td>
</tr>
<tr>
<td>Age 6–7</td>
<td>114</td>
<td>111</td>
</tr>
<tr>
<td>Age 7–8</td>
<td>27</td>
<td>26</td>
</tr>
<tr>
<td>Over 8</td>
<td>4</td>
<td>7</td>
</tr>
<tr>
<td>Total</td>
<td>252</td>
<td>254</td>
</tr>
<tr>
<td></td>
<td>506</td>
<td>521</td>
</tr>
</tbody>
</table>

7.1 Traffic skills in 5- to 8-year-old children

Traffic skills, as measured in the yellow walk, are exemplified by the ability to select safe crossing places, deciding when it is safe to cross, being able to plan ahead, and understanding what makes a place dangerous to cross.
A child consistently demonstrating competence in all the above skills would be scored 1 on this measure, while a child who demonstrated no such skills would score 0. The average skill level for making such decisions for all completers (whether partial or full) was 0.59 (range=0.09–1.0; standard deviation (SD)=0.18. No effects were found of SEG, region or location of residence. The mean score for girls was higher than that for boys, though not significantly so. However, scores improved significantly with age (F=17.24, d.f.=2,754, p<0.001) across all tasks, as shown in Figure 7.1, although there was no significant interaction between age and the type of task.

Overall, children were better at deciding when to cross (Task b) than for any other task, and children perform least well in demonstrating an understanding of dangerous crossings (Task d). There was no effect of gender, SEG, region or location of residence on yellow walk scores.

**Figure 7.1 Age-related scores in traffic skills for individual tasks**

![Figure 7.1 Age-related scores in traffic skills for individual tasks](image)

7.2 Spontaneous traffic awareness in 5- to 8-year-old children

Examples of spontaneous (uncued) traffic awareness, as measured with the green walk, are remembering to stop at the kerb, to look out for traffic before crossing roads, controlled crossings or driveways, and to look both ways whilst crossing, even when holding a hand. The child should demonstrate this behaviour without any reminders.

As with the traffic skills measure, a child’s score could range from 0 to 1. The average level of competence was 0.63 (range = 0.20–1.00; SD = 0.13). As with the yellow walk scores there was a significant effect of age on scores (F=7.55, d.f.=2,823, p<0.005) although, in this case, not all tasks yielded this age effect. These results are illustrated in Figure 7.2.
Overall, the general improvement in traffic awareness with age is accounted for by improvements in remembering to look both ways before crossing the road (Task a; \(F=3.827, \text{d.f.}=2,823, p<0.05\)), look each way before crossing a driveway (Task b; \(F=5.153, \text{d.f.}=2,823, p<0.05\)), and to look both ways when using a controlled crossing (Task e; \(F=5.836, \text{d.f.}=2,823, p<0.005\)). Children did not improve with age on remembering to look both ways while crossing was in progress even when holding a hand, or on remembering to stop at the kerb.

Children over 6 from rural areas were significantly poorer than their urban counterparts on remembering to stop at the kerb (Task c). There was no effect of gender, SEG, region or location of residence on green walk scores.

Figure 7.2 Age-related scores in spontaneous traffic awareness scores for individual tasks

7.3 Error avoidance in the 5- to 8-year-old children

Examples of error-avoidance were whether a child responds solely to pictures depicting damage but no error, to pictures depicting error but no damage, or to both. A child responding to error-only scenarios of the Child’s Judgement Task would be categorised as error-avoidant, response to damage-only scenarios would be categorised as damage-avoidant, and a mixed response would be categorised as transitional (between damage- and error-avoidant perspectives).

Twenty-five per cent of the children in the sample were categorised as damage-avoidant, 48 per cent as transitional, and 27 per cent as error-avoidant. As shown in Table 7.2, girls were significantly more likely than boys to be categorised as error-avoidant, and boys significantly more likely than girls to be categorised as transitional (\(X^2=8.03, \text{d.f.}=2, p<0.05\)).
Table 7.2

<table>
<thead>
<tr>
<th>Gender</th>
<th>Damage-avoidant</th>
<th>Transitional</th>
<th>Error-avoidant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Girls</td>
<td>26%</td>
<td>42%</td>
<td>32%</td>
</tr>
<tr>
<td>Boys</td>
<td>25%</td>
<td>53%</td>
<td>22%</td>
</tr>
<tr>
<td>Total</td>
<td>25%</td>
<td>48%</td>
<td>27%</td>
</tr>
</tbody>
</table>

The data in Table 7.3 indicate that children residing in urban locations were significantly more likely than those residing in rural locations to be categorised as transitional, and those in rural communities significantly more likely than those in urban communities to be categorised as damage-avoidant ($X^2=10.97$, d.f.=2, p<0.005).

Table 7.3

<table>
<thead>
<tr>
<th>Location</th>
<th>Damage-avoidant</th>
<th>Transitional</th>
<th>Error-avoidant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urban</td>
<td>22%</td>
<td>52%</td>
<td>26%</td>
</tr>
<tr>
<td>Rural</td>
<td>33%</td>
<td>39%</td>
<td>28%</td>
</tr>
<tr>
<td>Total</td>
<td>25%</td>
<td>48%</td>
<td>27%</td>
</tr>
</tbody>
</table>

A similar difference was found for regions, as shown in Table 7.4. Children residing in West Sussex were significantly more likely than those in Kent to be categorised as damage-avoidant and those in Kent were significantly more likely than those in West Sussex to be categorised as transitional ($X^2=16.51$, d.f.=2, p<0.005). The regional variation could be due to the nature of the samples, with a higher urban-based sample in Kent (83.2 per cent) compared to West Sussex (44.4 per cent).

Table 7.4

<table>
<thead>
<tr>
<th>Region</th>
<th>Damage-avoidant</th>
<th>Transitional</th>
<th>Error-avoidant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kent</td>
<td>19%</td>
<td>53%</td>
<td>28%</td>
</tr>
<tr>
<td>West Sussex</td>
<td>34%</td>
<td>41%</td>
<td>25%</td>
</tr>
<tr>
<td>Total</td>
<td>25%</td>
<td>48%</td>
<td>27%</td>
</tr>
</tbody>
</table>

Table 7.5 shows the proportions of children within each age group categorised as damage-avoidant, error-avoidant, or transitional. There is an effect of age on categorisation, with a clear shift away from a damage- towards error-avoidance perspective with increasing age. The major shift appears to occur between 5-year-olds and older children, with this difference being significant ($X^2=5.09$, d.f.=1, p<0.05). It is noticeable, however, that over 20 per cent of 5-year-olds have already attained an error-avoidant perspective, whilst about the same proportion of 6- to 7-year-olds and 7- to 8-year-olds retain a damage-avoidant perspective. It is this characteristic of the pattern of change, combined with approximately half the children within each age group remaining transitional, that renders the different age groups in this sample as being more similar than they are different.
Table 7.5

Proportions of children in categories by age

<table>
<thead>
<tr>
<th>Age</th>
<th>Damage-avoidant</th>
<th>Transitional</th>
<th>Error-avoidant</th>
</tr>
</thead>
<tbody>
<tr>
<td>5–6</td>
<td>31%</td>
<td>46%</td>
<td>23%</td>
</tr>
<tr>
<td>6–7</td>
<td>22%</td>
<td>49%</td>
<td>29%</td>
</tr>
<tr>
<td>7–8</td>
<td>21%</td>
<td>49%</td>
<td>30%</td>
</tr>
<tr>
<td>Total</td>
<td>25%</td>
<td>48%</td>
<td>27%</td>
</tr>
</tbody>
</table>

In summary, there was no effect of SEG on categorisation on the Child’s Judgement Task. There was an effect of region and location of residence, with a significant association between the two. There was an effect of gender, and an effect of age after age 5 in levels of damage- and error-avoidance.

7.4 Summary

Traffic skills and spontaneous (uncued) traffic awareness improve over time, producing significant differences in score levels between age groups. This improvement is consistent across all tasks for traffic skills, but is focused on only three of the five tasks for traffic awareness. Children’s ability to remember to stop at the kerb does not improve with age, or their ability to remember to keep looking both ways when crossing a road, even when holding a hand.

There is an age-related progression towards an error-avoidant perspective, with 5-year-olds being more damage-avoidant than older children. However, a large proportion of 6- to 7-year-olds remain damage avoidant, compared to the typical change in perspective for their age groups. For both boys and girls of all ages, those from rural communities are more likely to have a damage-avoidant perspective. Girls were more likely than boys to adopt an error-avoidant perspective rather than a transitional one, but boys are just as likely as girls to be non-damage-avoidant.

Overall, children residing in rural areas are more likely to be damage-avoidant, and the gap between rural and urban children on remembering to stop at the kerb widens for older children. This suggests that environmental factors are creating an effect on spontaneous roadside behaviour. All children fail to make significant progress with age on remembering to stop at the kerb and remembering to look both ways when crossing a road even when holding a hand. These findings suggest that without intervention children within the 5- to 8-year-old age range would fail to improve naturally with age on these tasks, and in developing an error-avoidant perspective.
Chapter 8 Changes in traffic skills and hazard awareness induced by the scheme

The analysis presented in this section uses the data set provided by returns made by families at the start and end of the main study. The analysis considers the changes as a consequence of using the scheme. In the previous section, it was shown that traffic skills, spontaneous (uncued) traffic awareness, and levels of error-avoidance typically improve with age. This chapter addresses the question of whether using the booklet assists parents in improving their child’s traffic skills and awareness, beyond this natural rate of progress.

The children spent, on average, just over seven weeks following the scheme; the distribution of time spent on the scheme is indicated in Table 8.1. There was a significant effect of location on time on the scheme, with families residing in rural locations spending longer (mean=52.02 days, SD=12.2) than families in urban locations (mean=48.87 days, SD=11.72) (t=2.27, d.f.=406, p<0.05).

Table 8.1

<table>
<thead>
<tr>
<th>Weeks spent on scheme</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
</tr>
</thead>
<tbody>
<tr>
<td>% children (N=448)</td>
<td>6.3</td>
<td>10.7</td>
<td>15.2</td>
<td>26.1</td>
<td>29.7</td>
<td>8.0</td>
<td>1.1</td>
<td>0.7</td>
<td>0.4</td>
<td>0.7</td>
<td>1.1</td>
</tr>
</tbody>
</table>

Table 6.1 has already presented full details of the returns from the September survey, from which the age and gender distribution are repeated below in Table 8.2. None of the children in this sample had received any formal road safety training prior to taking part.

Table 8.2

<table>
<thead>
<tr>
<th>Age</th>
<th>Male</th>
<th>Female</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 5</td>
<td>19</td>
<td>12</td>
<td>31</td>
</tr>
<tr>
<td>5–6</td>
<td>105</td>
<td>102</td>
<td>207</td>
</tr>
<tr>
<td>6–7</td>
<td>97</td>
<td>98</td>
<td>195</td>
</tr>
<tr>
<td>7–8</td>
<td>44</td>
<td>35</td>
<td>79</td>
</tr>
<tr>
<td>Over 8</td>
<td>4</td>
<td>5</td>
<td>9</td>
</tr>
<tr>
<td>Total</td>
<td>269</td>
<td>252</td>
<td>521</td>
</tr>
</tbody>
</table>

8.1 A control group

The primary function of a control group is to establish that any gains over time achieved by children participating in the study would not have accrued naturally over time (that is developmentally) without the intervention. For this study the group of children as a whole was able to act as the control group since they were different ages when they first entered
the scheme. Thus the first test scores for children of each age on entering the scheme were used to derive a measure of (natural) developmental change in road skill test scores. These data were then able to give rise to a predicted score for each child at the time the final set of measures is obtained. This score, based on predicted improvement as a consequence of natural development, was then compared with the actual score for each child at the end of the scheme. This approach additionally controls for variation in the number of days between the first and last tests, as this depends on when parents carry out the tests and was not the same for every child. The difference between predicted and actual scores can then be attributed to the impact of the scheme on the child’s traffic skills.

Only children for whom there were full data returns contributed to the control group in this way. Thus the strength of the control group was that the control sample was not only matched to the intervention sample on variables such as age, gender, socio-economic group (SEG), region and location of residence, but was also matched in terms of the family commitment to participation in road safety schemes: both the intervention group and the control group were, by definition, drawn from families which had completed the scheme and returned all the data sets.

This control group is preferable to one achieved in other ways because it most closely approximates the population to whom this scheme will apply. A control group extracted from families unwilling to participate, or who dropped out of the scheme, would present difficulties in interpretation since differences in progress between children in the intervention and control groups might as easily reflect general differences in attitudes to road safety education between those who will and will not participate. A control group drawn from a population not offered the scheme would only be comparable to the intervention group if the children were scored in the same way as those in the intervention group, that is by their parents and using the booklet.

8.2 The development of traffic skills (yellow walk)

The data support the hypothesis that, as a consequence of using the scheme, children show an improvement in deploying basic traffic skills, like finding safe places to cross the road, deciding when it is safe to cross, being able to plan ahead, and understanding what makes a place dangerous to cross. Overall, children had significantly higher skills scores at the end of the scheme compared to the beginning (F=4.25, d.f.=1,351, p<0.001). The significance of these results is independent of the child’s age and length of time on the scheme. Table 8.3 shows the mean scores obtained.

<table>
<thead>
<tr>
<th>Mean traffic skills scores for start and end of scheme (N=521)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Start of scheme</strong></td>
</tr>
<tr>
<td>Mean</td>
</tr>
<tr>
<td>SD</td>
</tr>
</tbody>
</table>
Although these results are consistent with the view that using the booklet supports parents in creating gains in their child’s basic traffic skills, as discussed in Chapter 8.1, ensuring that the changes are not ‘natural’ developmental ones requires comparison with a control group.

The ‘natural’ age-related improvement in traffic skills scores, presented in Chapter 7.1, were found to demonstrate a clear pattern in the rate of improvement with scores being linearly related to age (adjusted $R^2=0.04$, $F = 17.05$, d.f.=1,377, $p<0.001$; Slope=$0.00001331$, $t=4.13$, $p<0.001$) For the purposes of this study, this natural rate of improvement measure (co-efficient $B=0.00001331$) was used to calculate, for each child, a natural improvement score appropriate to the length of time between tests. This provides an ‘expected’ end of scheme score (mean=0.60, SD=0.17)\(^1\) with which the actual final test score may be compared. Any differences found can then be attributed to the booklet intervention.

Children had significantly higher scores at the end of the scheme than at the beginning, over and above the progress they would have made without the scheme ($t=19.88$, d.f.=368, $p<0.001$). Thus using the booklet creates more gains in traffic skills than would occur naturally over time. There was no effect of time spent on the scheme (mean=49.6 days, SD=11.91) on improvement in children’s scores; children who spent the maximum time on the scheme did not enhance their traffic skill scores significantly more than those who spent the minimum time on the scheme.

Overall, children improved their scores significantly for all tasks ($F=293.9$, d.f.=1,364, $p<0.001$). By the end of the scheme they had significantly reduced the overall disparity in performance on different tasks ($F(3,362)=8.36$, $p<0.001$) to become generally better on all tasks, rather than good at one or two and poor on the remainder as had been the case at the start of the scheme.

There was a significant difference in improvement on individual tasks ($F=184.1$, d.f.=3,1092, $p<0.001$), see Figure 8.1. Children remained best at judging when to cross the road, followed by judging where to cross the road, and then planning a route. They remained worst at demonstrating an understanding of dangerous situations. However, in terms of improvement in traffic skills by the end of the scheme, children’s understanding of dangerous situations (Task d) showed the largest improvement over all tasks. Their end-of-scheme performance on this task (mean=0.69, SD=0.18) exceeded pre-scheme performance on all tasks except judging when to cross the road (Task b).

\(^1\) Over the relatively short period of the scheme the actual expected mean increase was 0.000396 (SD=0.17, range=0.000224 to 0.000783).
Figure 8.1 Changes in traffic skills scores for different tasks

The second largest improvement in task scores was shown for judging where to cross the road (Task a). By the end of the scheme, scores for judging where to cross the road (mean=0.83, SD=0.17) had all but caught up with scores for judging when to cross the road (mean=0.84, SD=0.17).

The third largest improvement was seen in ability to plan a route (Task c). Children improved least on judging when to cross the road (Task b), the task for which they retained the best score.

There was no interaction between time on the scheme and age, gender, SEG, region or residence location for improvement in children’s scores on the yellow walk; children from all sub-groups improved their traffic skill scores significantly by the end of the scheme.

The relative improvement of the different age groups is shown in Figure 8.2. The youngest children’s final scores (mean=0.72, SD=0.14) those of the oldest children at the start of the scheme (mean=0.65, SD=0.16).
Figure 8.2 Scheme-based improvements in traffic skills scores for different age groups

The effect of age on individual traffic skills tasks is mixed. Figure 8.3 illustrates the percentage improvement (end scheme: start scheme) made by each age group of children for each task. As can be seen, although all children improved their skills knowledge considerably as a result of undertaking the scheme, for Tasks a, b and c (deciding where and when to cross, and planning a route) the amount of improvement fell with increasing age. For Task d (understanding dangerous crossings), however, the fall in improvement stabilised after the age of 6 years.

There remained a significant effect of age on ability to plan a route (Task c). Here the youngest children post-scheme (mean=0.70, SD=0.19) outperform the oldest children pre-scheme (mean=0.67, SD=0.23), but a clear improvement across age groups remains (F=5.458, d.f.=2,380, p<0.005). Compared to children measured at the outset to the scheme, 6-year-olds showed the greatest improvement in mean scores (from mean=0.60, SSD=0.23 to mean=0.76, SD=0.21), thus reducing the relatively large difference between the over and under 7s on this task prior to the scheme.

There also remained a significant effect of age on demonstrating an understanding of dangerous crossings (Task d). Here, again, the youngest children post-scheme (mean=0.64, SD=0.18) outperform the oldest children pre-scheme (mean=0.58, SD=0.21), but a clear improvement across age groups remains (F=5.772, d.f.=2,380, p<0.005). Task scores appear to increase more uniformly with age than was the case prior to the scheme.
Overall, the traffic skills scores of all children improved significantly. The general effect of the scheme appears to be to have had a greater improvement generally on the traffic skill scores of younger children, compared to older children: although a clear age effect was present before the scheme, the effect of the scheme is to eradicate age effects, so that, by the end of the scheme, younger children have caught up with older children. However, there remains a significant age effect on the two tasks for which performance was poorest. This age effect should, however, be viewed in the context of the significant improvement in skill levels for all tasks across all age groups. There were no significant effects of gender, SEG, region or location of residence on post-scheme yellow walk scores.

### 8.3 The development of spontaneous traffic awareness (green walk)

This aspect of the study considered the evidence that children show an improvement in spontaneous (uncued) traffic awareness, exemplified by remembering to stop at the kerb, look out for traffic before crossing roads, controlled crossings or driveways, and remembering to look both ways whilst crossing even when holding a hand.

The data support this hypothesis. Over the sample as a whole, there was a clear increase in children’s scores on the green walk between the start and finish of the scheme ($F=6.97$, d.f.$=1,469$, p$<0.01$). Table 8.4 shows the mean scores obtained.
Table 8.4

Mean traffic skills scores for start and end of scheme (N=521)

<table>
<thead>
<tr>
<th></th>
<th>Start of scheme</th>
<th>End of scheme</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>0.64</td>
<td>0.75</td>
</tr>
<tr>
<td>SD</td>
<td>0.17</td>
<td>0.15</td>
</tr>
</tbody>
</table>

These results are in line with the view that using the booklet supports parents in improving their child’s spontaneous roadside behaviour. The significance of these results is independent of the child’s age and length of time on the scheme. However, as with the yellow walk, proper support for the conclusion that using the booklet creates gains beyond those accruing naturally in the population requires a comparison to a control group.

The measures provided by the sample, presented in Chapter 7.2 (page 58), demonstrate a clear pattern in the rate of improvement, with scores linearly dependent upon age (adjusted $R^2=0.01$, $F=6.65$, d.f.=1,400, $p<0.001$), (coefficient $B=0.000006756$, $t=2.56$, $p<0.001$). For the purposes of this study this natural rate of improvement measure (coefficient $B=0.000006756$), was used to calculate, for each child, a natural improvement score appropriate to the length of time between tests. This provides an ‘expected’ end of scheme score (mean=0.64, SD=0.14)2 with which the actual final test score may be compared. Scores are controlled for by subtracting expected scores from actual test scores, and considering the difference between scores in place of the actual score. Any differences found are then attributable to the booklet intervention under evaluation here.

Children had significantly higher scores at the end of the scheme than at the beginning, over and above the progress they would have made without the scheme ($t=17.36$, d.f.=398, $p<0.001$). This consistent trend is illustrated in Figure 8.3, for the different tasks.

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2 Over the relatively short period of the scheme the actual expected mean increase was 0.000335 (SD=0.14, range=0.000189 to 0.000662).
As with the yellow walk, there was no effect of time spent on the scheme on improvement in children’s scores. There was, however, a significant effect of gender (F=6.93, d.f.=1,381, p<0.01), with girls showing a greater improvement between tests (end of scheme mean=0.77, SD=0.17) than boys (mean=0.73, SD=0.18). There was no effect of age, SEG, region or location of residence on amount of improvement in children’s scores on the green walk: children from all sub-groups improved their traffic skill scores significantly by the end of the scheme.

The relative improvement of various age groups is shown in Figure 8.4. From this graph it can be seen that the youngest children reached higher awareness scores (mean=0.74, SD=0.1), far in excess of the scores for the oldest children at the start of the scheme (mean=0.65, SD=0.14). However, the average scores for each of the three age groups did not differ significantly.
Unlike with the skills (yellow walk) scores, there is no disparity between different age groups for traffic hazard awareness improvement. As Figure 8.5 indicates, for all tasks there was a negatively linear relationship between improvement and age: older children improved less than younger children.

In terms of improvement in spontaneous (uncued) traffic awareness, then, children showed the greatest gain in remembering to look before crossing driveways (Task b) – see Figure 8.5. Their performance on this task (mean 0.82, SD=0.16) exceeded pre-scheme performance on all tasks except remembering to stop at the kerb and to look both ways before crossing.

The second largest improvement in traffic awareness scores was shown for remembering to look each way for traffic at a controlled crossing (Task e). This degree of improvement was almost matched by remembering to look both ways for traffic before crossing (Task a). Children showed least improvement in remembering to stop at the kerb (Task c), the task they remained best at remembering; they demonstrated slightly more improvement in remembering to look both ways for traffic whilst crossing, even when holding a hand (Task d).

Overall children improved their scores significantly for all tasks (F=250.8, d.f.=1,393, p<0.001) and by the end of the scheme had significantly reduced the disparity in performance on different tasks (F=17.394, d.f.=4,390, p<0.001). Furthermore, improvement was seen in those tasks which were not found to improve naturally with age (see Chapter 7.2), namely, remembering to stop at the kerb, and remembering to look both ways whilst crossing the road even when holding a hand.
No effects were found of SEG, region or location of residence. The effect of gender on scores, which in pre-scheme children had neared significance, in post-scheme children just reached significance (F=2.234, d.f.=5,389, p<0.05) with the mean for girls (mean=0.77, SD=0.21) being significantly higher than that for boys (mean=0.73, SD=0.19). The effect of gender was found to be accounted for by three of the five tasks comprising the green walk. On each task girls had significantly higher scores than boys (see Table 8.5). These tasks included remembering to look for traffic before crossing the road (Task a) (F=4.934, d.f.=1,393, p<0.05), remembering to look for traffic before crossing driveways (Task b) (F=6.331, d.f.=1,393, p<0.05), and remembering to stop at the kerb (Task c) (F=4.582, d.f.=1,393, p<0.05).

Table 8.5

<table>
<thead>
<tr>
<th>Task</th>
<th>End-of-scheme traffic awareness scores for girls and boys</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mean</td>
</tr>
<tr>
<td>Task a</td>
<td></td>
</tr>
<tr>
<td>Girls</td>
<td>0.84</td>
</tr>
<tr>
<td>Boys</td>
<td>0.80</td>
</tr>
<tr>
<td>Task b</td>
<td></td>
</tr>
<tr>
<td>Girls</td>
<td></td>
</tr>
<tr>
<td>Boys</td>
<td></td>
</tr>
<tr>
<td>Task c</td>
<td></td>
</tr>
<tr>
<td>Girls</td>
<td></td>
</tr>
<tr>
<td>Boys</td>
<td></td>
</tr>
</tbody>
</table>

The remaining green walk task (remembering to look both ways for traffic when crossing was in progress, even when holding a hand – Task d, and remembering to look each way for cars when crossing at a controlled crossing – Task e), were not subject to a gender effect.
Overall, therefore, spontaneous traffic awareness scores of children improved significantly. The general effect of the scheme appears to be to have had a greater improvement generally on the awareness scores of younger children, compared to older children: although a clear age effect was present before the scheme, the effect of the scheme was to eradicate age effects so that, by the end of the scheme, younger children caught up with older children.

There was a significant gender effect, accounted for by three tasks on the green walk, indicating that girls are better able to benefit from the scheme than boys (this finding, of course, reflects the general trend for girls to improve more than boys as a result of educational interventions). However, both boys and girls significantly improved their scores on all these tasks compared to scores attained prior to the scheme. There was no effect of SEG, region or location of residence on post-scheme green walk scores.

8.4 The transition from a damage- to an error-avoidant perspective

This aspect of the analysis considers the evidence that children show an improvement in their ability to correctly attribute fault in the Child’s Judgement Task. This would be demonstrated by a child moving from a damage-avoidant perspective to either a transitional or an error-avoidant perspective, or from a transitional to an error-avoidant perspective.

There was an overall movement in category between the start and end of scheme as can be seen in Table 8.6. Though over 19 per cent of the children regressed during the scheme, the movement to an improved perspective by the end of the scheme was found to be significant (Wilcoxon z-score=2.98, p<0.001).

| Table 8.6 |

Proportions of children in the Child’s Judgement Task categories for the start and end of the scheme (N=220)

<table>
<thead>
<tr>
<th>End of scheme %</th>
<th>Damage-avoidant</th>
<th>Transitional</th>
<th>Error-avoidant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Start of scheme %</td>
<td>Damage-avoidant</td>
<td>3.2</td>
<td>12.7</td>
</tr>
<tr>
<td>Transitional</td>
<td>5.0</td>
<td>28.2</td>
<td>14.5</td>
</tr>
<tr>
<td>Error-avoidant</td>
<td>5.5</td>
<td>8.6</td>
<td>12.3</td>
</tr>
</tbody>
</table>

The overall improvement in error-avoidant perspective was significant for 5-year-olds (z=1.92, p<0.05), with the proportions of children in each category at the end of the scheme approximating those for older age groups at the start of the scheme. Similar shifts towards an error avoidant perspective occurred in the older age groups, nearing significance for 6-year-olds (z=1.78, p=0.07). Proportions of children in each category at the end of the scheme are shown for each age group in Table 8.7.
Table 8.7

**Proportions of children in Child’s Judgement Task categories by age**

<table>
<thead>
<tr>
<th>Age</th>
<th>Damage-avoidant</th>
<th>Transitional</th>
<th>Error-avoidant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age 5–6</td>
<td>19%</td>
<td>45%</td>
<td>36%</td>
</tr>
<tr>
<td>Age 6–7</td>
<td>11%</td>
<td>51%</td>
<td>38%</td>
</tr>
<tr>
<td>Age 7–8</td>
<td>6%</td>
<td>59%</td>
<td>35%</td>
</tr>
<tr>
<td>All</td>
<td>14%</td>
<td>49%</td>
<td>37%</td>
</tr>
</tbody>
</table>

For children who were categorised as damage-avoidant only at the outset of the scheme, the movement towards an error-avoidant perspective was significant for 5-year-olds ($z=3.40$, $p<0.001$), and for 6-year olds ($z=2.659$, $p<0.01$).

The data show that by the end of the scheme, the proportion of 5-year-old children in the damage-avoidant category had reduced, becoming equivalent, to levels found in 6- to 7-year-old children prior to the scheme (see Figure 8.6). Similarly, by the end of the scheme the proportion of 5-year-old children in the error-avoidant category had increased to that found in older children at the start.

In the over 6s the proportion of damage-avoidant children had halved and the proportion of error-avoidant children increased by a corresponding amount. Levels of children in the transitional category remained stable (although the population of children constituting this group varied with the movement of children into and out of this stage). The implications of such results for targeting the scheme to children of more specific age groups will be considered later in the overall summary of this report.

**Figure 8.7: Proportions of children in Child’s Judgement Task categories at the start and end of the scheme**

There were no effects of gender, SEG, region or location of residence in these data.

The data from this study thus support the hypothesis that parents using the quiz materials were successful in fostering an increased awareness of error-avoidance in children who were purely damage-avoidant at the outset of the study.
8.5 The impact of the scheme on error-avoidance

The data from this study support Thornton et al’s (1998) theoretical analysis, suggesting that enhancing the child’s competence and comprehension of specific traffic skills will not necessarily foster an increase in error-avoidance. As predicted there was no significant relationship between improvement in scores on the yellow walk and the transition from damage- to error-avoidance. Children showed marked changes in their performance and comprehension of traffic skills when cued to think about road safety, without showing an increased awareness of error-avoidant criteria (Pearson’s r=0.012, p=0.818).

The data lend inconclusive support to the thesis that an increasingly error-avoidant perspective mediates the spontaneous deployment of traffic awareness. The relationship between improvement in scores on the green walk and the transition to a greater sensitivity to error-avoidance is close but lacks significance (Pearson’s r=0.089, p=0.075). The relationship between improvement in scores on the green walk and on the yellow walk is significant (Pearson’s r=0.450, p<0.001).

The near significant relationship between green walk score improvement and the shift towards error-avoidance, and the non-significant association between yellow walk score improvement and shift towards error-avoidance, tends to confirm the hypothesis that an error-avoidant perspective is more closely associated with spontaneous (uncued) traffic awareness than with taught traffic skills.

The significant association between yellow walk and green walk score improvement does not imply that training on traffic skills causes improvement in spontaneous traffic awareness since green walk skills were directly taught by the scheme. Thus the scheme teaches both traffic skills and traffic awareness, and all children were successfully tutored on both measures. The findings regarding this hypothesis, therefore, are inconclusive, although this has no implications for the findings concerning the impact of changes induced by the scheme.

8.6 Summary

The study supports the conclusion that parents using the booklet induce improvements in the level of their child’s competence and comprehension of basic traffic skills, in the extent to which their child is spontaneously traffic aware even when not reminded of road safety issues, and in the child’s understanding of error-avoidance as a principle in road safety. These findings are in line with the view that use of the scheme induces significant improvements in traffic skills and the ability to remember, unaided, to deploy such skills at the roadside, and in an understanding of the need actively to avoid traffic danger. Thus all such measures were significantly higher in post-scheme children compared to children at the outset of the scheme, with the youngest children at the end demonstrating levels of ability in excess of those demonstrated by the oldest children at the beginning of the scheme. The exception lay in two yellow walk tasks, where older children continued to demonstrate a greater ability to plan, and a better understanding of dangerous traffic situations.
Girls benefited on three of the green walk tasks to a greater extent than boys. Again, this gender difference occurred in the context of an overall significant improvement in task scores for both genders.

Compared to children categorised at the outset of the study, numbers categorised as error-avoidant improved significantly post-scheme. Whereas prior to the scheme over a fifth of the six- to seven-year-olds were categorised damage avoidant, post-scheme these figures reduced to 11 per cent and 6 per cent respectively. Figures for 5-year-olds in this category fell by one-third. Prior to the scheme, a significant effect of gender was found. This did not persist through to completion of the scheme.

Similarly, at the outset of the scheme larger numbers of children residing in rural areas were categorised as damage-avoidant, compared to those residing in urban areas. By the end of the scheme, however, children residing in rural locations were just as likely as urban children to be error-avoidant, eliminating this difference.

The effect of age and location on remembering to stop at the kerb found prior to the scheme, in which older children residing in rural areas fell further behind those from urban areas than did younger children, was also eliminated.
Chapter 9 Parental responses to the scheme

An important feature of the scheme was that it should be usable, and be perceived as useful, to the parents involved. Thus opinions of parents to the scheme were solicited, to:

- assess both the **usability** and **usefulness** of the booklet and quizzes;
- investigate overall views about the scheme, booklet and activities;
- ascertain whether parents felt they had received sufficient support in completing the evaluative aspects of the scheme (that is returning data); and
- obtain current attitudes on the perceived danger to children of road traffic.

A questionnaire was distributed to parents as part of the final materials pack to 1,100 families who had returned their initial set of data sheets (this includes 75 parents who actively withdrew from the scheme). Parents were asked to complete the form and to return it with their final set of completed activity sheets, and 561 parents did so (of whom 521 had fully completed the scheme). The following presents a summary of the responses.

9.1 The usability and usefulness of the booklet and scheme

9.1.1 *Experiences using the booklet*

- 77.5 per cent of the parents found the booklet Easy/Very easy to read and understand; 53 per cent found the scheme Easy/Very easy to do.

- Parents clearly felt that the scheme had been of value in teaching their children aspects of road safety. Thus just over 95 per cent felt that their children had learnt Something/A lot from the scheme.

- Despite the clear impact of the scheme on training opportunities for road safety awareness, it had no direct impact on the amount of time parents spent walking with their child (92.5 per cent of parents reported this).

9.1.2 *Booklet design*

- An important feature of the feedback concerned the presentation of the scheme through the booklet. Parents found it easy to follow and were satisfied with both the booklet and the print size. They also reported that children liked the pictures in the booklet and were generally able to understand them. In the few cases (12 per cent) where parents reported that their child did not understand the pictures, the child was significantly more likely to be in the younger, 5-year-old, age group ($X^2=12.09$, d.f.=2, $p<0.005$).

- Most parents (90.4 per cent) felt the booklet contained sufficient information.
9.1.3 The Child’s Judgement Tasks

- Reports on using the Child’s Judgement Task indicate that two-thirds of children sometimes did not understand the pictures. These children were significantly more likely to fall into the younger, 5-year-old, age group ($X^2=15.39$, d.f.=4, $p<0.01$). However, most parents found the instructions for the Child’s Judgement Task to be clear.

- Most parents (81.5 per cent) reported the pictures in the Child’s Judgement Task to be large enough for their purpose. Again, however, parents of 5-year-old children were significantly more likely to express the view that the pictures were not large enough ($X^2=12.30$, d.f.=2, $p<0.005$).

- Parents were invited to contribute comments on the Child’s Judgement Task, although only 123 (22 per cent) elected to do so. Of these, 10 per cent of the parents remarked how “enjoyable” they had found the activity and a further 12 per cent praised the usefulness of the activity in raising awareness and stimulating useful discussion on aspects of road safety. Other comments criticised the ability of the pictures to depict the road safety scenario (46 per cent) and suggested that they thought the pictures to be too small for their purpose (18 per cent).

9.1.4 The yellow/green walks

- About a third of parents reported finding it difficult to find suitable routes for the walks. These findings were reflected also in the numbers of parents expressing difficulty with using the activity sheets whilst out walking. Thus 37 per cent found difficulty in finding suitable routes and 34.8 per cent found difficulty in using the sheets.

- Parents were invited to make further comments on the yellow/green walks, with only 169 (30 per cent) electing to do so. Most comments focused on practical aspects of carrying out the activities, particularly the “difficulties of finding several different suitable road scenarios” for the tests (46 per cent), and such matters as dealing with their child’s tiredness or impatience (8 per cent). Parents also expressed difficulty with completing the score sheets (9 per cent), especially in bad weather, and specific design suggestions were made (for example, using tick boxes or some easier recording mechanism). However, a number of parents took this opportunity to express the view that the activity sheets were “worthwhile and useful for focusing on road safety” (8 per cent).

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1. 10 per cent of parents completing the questionnaire
2. 4 per cent of parents completing the questionnaire
3. 14 per cent of parents completing the questionnaire
4. 2 per cent of parents completing the questionnaire
9.2 Overall views of the scheme

Eighty-seven per cent of parents providing feedback gave their views on the booklet and activities. Overall, 93 per cent made positive comments under the various headings, and 19 per cent made negative comments (so that some parents took the opportunity to be both positive about some things and critical about others).

A wide range of comments were elicited; parents valued the scheme for “reinforcing the road safety message and raising it as a topic for discussion” (20 per cent), and as “a practical means of assessing their child’s ability to understand the hazard posed by traffic” (5 per cent). Other comments described the scheme as being “well thought out and thorough” (5 per cent). Parents also reported on the problematic nature of completing and returning the sequence of activities required for evaluation of the scheme (6 per cent).

Eighty per cent of parents expressed a view on what they thought was best about the scheme. Comments predominantly focused on the booklet and activity content, with a third of the parents commenting on design and materials. Most parents praised the scheme for its “awareness raising of road safety issues” (25 per cent) and “prompts for discussion on aspects of road safety” (58 per cent). Parents felt the booklet was “easy to follow” and “explained things well” (14 per cent), and referred to the benefits of using pictures (13 per cent).

Fifty-three per cent of parents expressed a negative view. The comments underline aspects of the survey that appeared under earlier measures, namely:

- the “time-consuming” and “complicated” nature of completing several data sheets that included not only scores for the yellow and green walks but also demographic data, measures of error-avoidance, and feedback data, for the purposes of the study (27 per cent5),

- difficulty with finding suitable road scenarios for the tests (17 per cent5), and

- difficulty in interpreting the small pictures used in the Child’s Judgement Task (10 per cent6).

9.2.1 Views on the impact of the scheme on what parents say and do when walking with their child

Eight-two per cent of parents expressed a view under this heading. There are many ways (except for the few [11 per cent] whose response was “No change!”) that participation in the scheme has brought about important changes in the reported behaviour of parents.

Most noticeable was an “appreciation of the road safety task from the child’s perspective” – understanding how this might differ from the adult’s (42 per cent). Importantly, 24 per cent

5 17 per cent of parents completing the questionnaire
6 6 per cent of parents completing the questionnaire
of parents reported that as a result of the scheme they actively involve their children in decision-making at the roadside, rather than just keeping the child safe. Some parents remarked indirectly on this improvement, by observing the need to “remind their child less frequently about walking safely” (5 per cent). Parents also reported how their “awareness of traffic danger has increased” (13 per cent) and that they now “monitor their child more closely” (7 per cent). Other parents reported on how they now “discuss road safety with my child more” (22 per cent); whereas others described how their own road safety habits had become “sloppy” and that they had been provoked by the scheme into tightening them up (8 per cent).

9.2.2 Views on how the scheme could be improved

An important outcome of the survey was to elicit parental views how the scheme might be improved, as part of the ongoing process of improving the overall design of the scheme, its booklet and activities. Forty-seven per cent of parents took this opportunity to make suggestions, although 20 per cent of parents commenting thought it was “Fine as it is”.

The predominant viewpoint was a very clear expression of a perceived need to provide regular road safety tuition (31 per cent), perhaps combined with school visits (11 per cent). Other views reflected issues raised by previous questions, such as allowing more time for the walks to be completed (8 per cent), at a time of year when the weather is better (9 per cent), and improving the clarity of pictures for the Child’s Judgement Task (10 per cent). Twenty-four percent of parents suggested the inclusion of a child’s activity booklet, as a possible means of “improving the scheme’s appeal to the youngest children” (24 per cent).

9.3 The support provided during the survey

The level of support provided for the evaluation process: sending parents reminders and providing them with a checklist and incentive stickers for their child, was an important revision to the design rationale for the main survey. Parents were therefore asked whether they found the level of support to be sufficient. The data suggest that the methods employed were adequate for most (about 90 per cent) of parents.

9.4 Road safety issues

9.4.1 Views about traffic danger

A goal of the survey was to estimate the extent to which parents think traffic poses a danger. The data do suggest that parents think that traffic poses a danger to their child, with 97.1 per

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7 9 per cent of parents completing the questionnaire
8 15 per cent of parents completing the questionnaire
9 5 per cent of parents completing the questionnaire
10 4 per cent of parents completing the questionnaire
11 11 per cent of parents completing the questionnaire
cent considering the danger to be “some” or “great”. This view was more frequently expressed by parents of boys, although this trend just did not reach significance (X²=7.44, d.f.=3, p=0.059).

A further feature of the survey was to estimate the extent to which parents worry about the danger of traffic since using the booklet. Overall, parental responses suggest that they do not substantially change their views (73.9 per cent). Indeed, parents of children residing in rural locations were significantly more likely to have increased the amount they worry than their urban counterparts (X²=4.39, d.f.=2, p<0.001).

9.4.2 Views on the biggest cause of traffic danger to child safety

Parental views were elicited on the causes of traffic danger, with 81 per cent of parents expressing a view. Most (67 per cent) thought that “excessive speed” and “lack of awareness or care, by drivers” posed the greatest danger to child safety, followed by “traffic density” (28 per cent), “lack of safe crossing areas” (8 per cent), and “visibility problems posed by parked cars” (17 per cent). However, more than a quarter of parents also highlighted the “child’s own lack of awareness and understanding of road safety issues” in contributing to this danger (28 per cent), indicating that this message of the scheme is clearly getting through.

9.4.3 Views on the best way to reduce traffic danger to child safety

Parental views were also elicited on ways to reduce traffic danger. Eight-five per cent of parents commented on how they felt the danger posed to children by traffic could be reduced. The most prevalent view was that “children’s road safety education” should be the focus of attention both at home and at school (45 per cent), combined with “assessing child ability” and “supervising adequately” (22 per cent). The need to “improve driver education” also received comment (11 per cent).

Many parents expressed the view that more could be done to “improve traffic management and the dangers it poses in residential and school areas” (39 per cent), perhaps in conjunction with an overall move to reduce car usage (8 per cent).

9.5 The evaluation process

Parents’ experiences with the need to complete and return activity sheets highlighted some significant difficulties with this, although, again, this is not an aspect of the scheme per se. Parents found the evaluation process to be the worst thing about the scheme and this is likely to have impacted on the return of data to the survey, acting to reduce estimates of interest in the scheme.

In this context, it is useful to consider the reasons given by families actively withdrawing from the scheme once underway. They cited a range of reasons for withdrawal, for the most part personal. However, nearly 35 per cent of the 75 parents withdrawing from the scheme attributed their withdrawal to the demands of the survey being too complicated/time-
consuming (see Table 9.1). Their comments reflect administrative aspects of the scheme, rather than problems with the booklet or activities, indicating that the provision of support for the evaluative components of the survey, were not sufficient for these parents.

Table 9.1

<table>
<thead>
<tr>
<th>Parental views of the evaluation process</th>
<th>Parents responding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Too complicated/time-consuming</td>
<td>34.7%</td>
</tr>
<tr>
<td>Family crisis/bereavement</td>
<td>18.7%</td>
</tr>
<tr>
<td>No reason given</td>
<td>17.3%</td>
</tr>
<tr>
<td>Weather/finding routes</td>
<td>9.3%</td>
</tr>
<tr>
<td>Child too young</td>
<td>8.0%</td>
</tr>
<tr>
<td>Child moved</td>
<td>5.3%</td>
</tr>
<tr>
<td>Pack received late</td>
<td>5.3%</td>
</tr>
<tr>
<td>Child refusal</td>
<td>1.4%</td>
</tr>
</tbody>
</table>

Parents reported an appreciation of the road safety task from the child’s perspective, understanding how this might differ from the problem for the adult, and 24 per cent of parents report that they now actively involve their children in decision-making at the roadside. Other parents report on the general improvement of their own road safety habits and those of other members of their family.

9.6 Summary

The data obtained via feedback questionnaires support the view that the scheme achieved all its main objectives. Parents found the scheme easy to understand and use, and of practical benefit. They liked the materials and found them stimulating. They praised the effects of the scheme on their family attitudes to road safety. And they regarded the scheme sufficiently highly to recommend it for more widespread implementation.
Chapter 10 Summary and conclusions

Through a series of empirical and survey studies this report has demonstrated that bringing children into the social contract of road use can improve their road traffic and hazard awareness skills. This ‘contract’ is a social-interactive process as well as a perceptuo-cognitive one. It includes maintaining safety through a variety of social processes, including calculating the intentions and expectations of other road users and negotiating with other road users. It is expressed in a developmental change from damage- to error-avoidance (from focusing on the outcome of an accident as a cause for blame rather than on the antecedents and the ‘perpetrator’). Adults and older children have generally made this change but younger children do not reflect the actions of others. They have relatively little understanding of the effect of their actions on other road users, or that there is any need to co-ordinate with other road users to keep safe.

The studies detailed in this report evaluate the effectiveness of a booklet-based self-support scheme designed to bring children into the social contract of road use by accelerating the shift towards an error-avoidant perspective. The booklet material contained a mixture of road safety-related information, practical tasks, and evaluation measures. The content was based on the outcomes of previous research relating to developmental changes in road traffic skills, hazard awareness, and the perception of blame. A fundamental precept of the scheme was that it did not take a didactic approach; rather the training appeared through engagement with the booklet – mediated by the child’s parents.

The work has demonstrated that relevant information and ‘quiz’ materials can accelerate the developmental change in a 5- to 8-year-old population. Moreover, when using the material and procedures appropriately, parents make reliable agents for effecting the change. Children’s traffic skill and hazard awareness levels at the end of a roughly two-month period of using the scheme were significantly improved, to such an extent that younger children’s final scores were higher than those of children 2–3 years older at the start of the scheme. Significant shifts from damage- towards error-avoidance perspectives were also observed. These improvements were largely independent of location (rural vs. urban), socio-economic group (SEG), and gender. Indeed, the scheme activities demonstrated an ability to remove any such differences that occur ‘naturally’ in the population. For example, whereas at the start of the scheme girls were more likely to be error-avoidant than boys, by the end of the scheme such gender differences were not apparent in the samples.

10.1 The scheme and its administration

This report provides a detailed account of a series of studies designed to test both the validity/reliability of the scheme and its effectiveness within a naturalistic environment. Again, the scheme is intended to be operated without intervention from any organised training structures, such as schools or Road Safety Officers (RSOs). Rather, through its agent – the self-contained booklet, the scheme is designed to be taken up by parents/guardians at will. Booklets could be made available, on a passive basis, in schools, libraries, post offices, etc., for people to use as and when they wish. For this reason, some
considerable project resource was assigned to ensuring that parents would find the booklet appealing and usable and would be able to use it effectively and reliably. Since part of the scheme requires practical application of some of the material presented, through parentally chosen ‘walks’ with ‘quizzes’, it was important to ensure that they understood their tasks and could score the quizzes appropriately. For this reason a series of ‘contrived naturalistic’ studies was undertaken, before a main survey-based study to investigate the scheme’s effectiveness under more ‘real life’ conditions.

The practical walks and quizzes were included both for training and data gathering reasons. They provided both the parents and the children with a practical structure upon which to base and reinforce the information contained in the booklet. At the same time, however, they also provided the information upon which the effectiveness of the scheme could be evaluated; that is the extent to which children improve their traffic skills and hazard awareness and accelerate the shift into a social contract of road use. Whereas collection of these kinds of data for analysis purposes was relatively easy and reliable in the more ‘contrived naturalistic’ studies, when it came to evaluation of the scheme under as ‘natural’ an environment as possible (that is through passive uptake), problems clearly became apparent. Thus the additional burden placed on the scheme by the necessary data gathering aspect had a major impact on the amount of data that was collected. Parents may have undertaken and completed the scheme with their children, but in large numbers they failed to return the data needed both to show that they had done so and for the analyses. Thus the very large-scale survey undertaken in May 2000, with nearly 10,000 booklets distributed via 70 schools in four regions of the country, failed to provide evidence that the effectiveness of the scheme already demonstrated in the ‘contrived naturalistic’ environment would be repeated in ‘real life’. Only 499 (5.3 per cent) of the parents returned an initial response form to indicate their interest in participating and, of these, just 75 (0.8 per cent of the material distributed) returned all three data sets at intervals requested.

This was clearly a major blow to the research, though it provided a salutary lesson: when undertaking large scale surveys of this nature some prior ‘risk assessment’ needs to be made to determine appropriate activities in the event of survey failure. This would include supplementary plans for identifying and following-up non-respondents to ascertain the reasons for their lack of response. This is particularly important in situations such as that pertaining to the current evaluation, where there is a potential conflict between the training and data-gathering functions of the quizzes and where this conflict could then compound with additional administrative burdens. Parents, schools, and even the RSOs recruited to help distribute the materials to schools have many other things to do in their already busy lives. Assiduously distributing material, recording data and returning it to appropriate people adds to these burdens, particularly when the scheme ‘relies on passive uptake’ and requires no prior commitment to it.

The late measures taken to evaluate reasons for non-response met with some success. Parents, Head Teachers and RSOs were each surveyed in an attempt to determine why there had been a poor response in terms of data returns (though it is not known whether this reflected an equally poor response in terms of scheme uptake). Unfortunately, because of the lack of any prior preparation for this kind of work, the numbers of actors surveyed were
relatively low (and significant time had passed). Nevertheless, some clear direction emerged
to demonstrate that the scheme per se was not the problem; rather it was the administration
surrounding it: the lack of a temporal structure for parents, the increased workload for
parents and teachers, the lack of support and ‘opt-in’ procedures for parents, and a lack of
close personal contact with the schools. When such issues were addressed in a subsequent
survey in September 2000, a higher completion rate was obtained (27 per cent) from the
nearly 2,000 booklets distributed. The data obtained enabled the effectiveness of the scheme
to be considered more effectively.

10.2 Conclusion

In summary, the scheme developed for this project has been successful. Evaluation has
demonstrated that it provides a practical method for parents (of 5- to 8-year-olds) to help
improve their children’s road safety skills and hazard awareness. Once some of the
administrative barriers had been removed/reduced, a relatively large number of parents were
willing to adopt the scheme and they provided positive reactions to it.

Of course, there remains room for further work and development. The qualified success of
this series of studies does not provide concrete evidence that left in a passive mode of
uptake the scheme will successfully improve child road safety. There was no evidence, one
way or the other, that parents will operate the scheme without additional encouragement and
support – as it is intended. The May 2000 survey’s relative failure and the September 2000
survey’s relative success serve only to demonstrate that the administration required for the
research posed a major stumbling block. Thus more work could well be done to study the
impact of the scheme under natural conditions. Additional work could also be undertaken to
investigate whether the scheme itself might be condensed in time – for example, whether
just one of the walks (yellow or green) might be sufficient to induce an improvement in
traffic skills and thus potential accident reduction.

Since, following from this project, data are no longer required to demonstrate the
effectiveness of the scheme and booklet, future effort could well be directed towards less
invasive and time-intensive evaluation methodologies. Relatively ‘simple’ observational
and/or questionnaire surveys of children’s skills and traffic awareness prior to and post a
‘passive’ booklet distribution scheme could well provide more effective data. Additional
possibilities include using less costly distribution methods and media than a glossy,
coloured brochure (which costs about 50p per copy to produce the numbers required in this
work – distribution costs were then additional to this). For example, provision of the booklet
on a suitable Web page (which would also provide useful data on ‘hit rate’, etc.) could be
considered, as well as the use of the media (for example a series of articles in the local press
sequentially providing the booklet information and tasks), or free material, such as a
CD ROM of the leaflet/website, in cereal packets.

Secondly, the studies described in this report suggest that the scheme may be differentially
effective for children of different ages. The improvements over the scheme, for example,
imply that older children may improve more on some individual tasks than on others.
This begs the question considered at the outset: whether separate booklets should be
considered for younger (for example under 6) and older (for example over 6) children. Developmentally, they may be differentially receptive for different kinds of messages (for example decision-making vs. evaluation tasks/information). At the same time, however, there is an issue of the extent to which age groups overlap: some 5-year-olds are very advanced for their age. They stand to gain from the current booklet, over and above the other children in their age group, because they have access to the full range of material contained within it. Similarly, a 7-year-old who is lagging behind his or her age mates has access to material that would otherwise be denied them just on the grounds of their age. The question of whether the scheme is best served by a combined booklet for all ages or separately targeted booklets is, of course, an empirical one.

Finally, the impact of the scheme on the parents themselves should not be overlooked. Thus it specifically involved parents as the trainers and the booklet was designed to appeal to them and to be read by them. Initial feedback on the booklet during the pilot studies indicated that the scheme offered a child-orientated perspective on road safety issues that was new to parents. It may be that, having read the booklet once, parents’ understanding of the problems of road safety from the child’s perspective are altered so fundamentally that subsequent interactions with their children serve to reinforce the message underlying the scheme in an enduring way. This may happen irrespective of whether they formally carried out the walks, as laid out in the booklet. The booklet encouraged parents to talk about how they solve the problem of crossing the road, how they avoid accidents, and to explain how accidents happen and how the child’s behaviour can contribute to this. Alerting parents to these issues may be sufficient to bring about the observed changes in behaviour documented in the study, and may be achievable simply by the parent having read the booklet once.

Unfortunately, such an hypothesis could not be tested using the data in the present study since it was designed as a child training study rather than one that investigated the impact on the trainer’s (parental) behaviour.

There is a range of such research questions that could be addressed in further work but, as indicated above, this present work has demonstrated the value of the scheme to improving 5-to 8-year-old children’s road safety skills and hazard awareness.

Acknowledgements

The authors wish to thank Deirdre O’Reilly of the Department of Transport, Local Government and the Regions and Professor A J Chapman of the University of Wales Institute, Cardiff, for their advice and guidance at the inception of, and subsequent support during, this project. We also wish to thank Kerry Devitt for her enthusiastic work in the first years of the study, and Sian Williams for her contribution to the analysis of data for the main survey. We also thank Road Safety Education Officers Sara Facer, Barbara Deekes and Rosemary McDaid, for their comments and advice on the materials developed in this project, and we thank the Road Safety Officers for Kent (Eric McCrae, Steve Horton), Herefordshire (Richard Glasspoole, David Holmes, Ann Mann), East Sussex (Keith Sinden), West Sussex (Phillip Ramsay, Honor Byford, Chris Wills), and Worcestershire (Roger Woodward), for their work in liaising with schools, assistance in the distribution of materials, and willingness to help out whenever called upon. And thanks to Professor David
Oborne for his contribution in the presentation of these findings. Finally, we thank the schools, parents and children who took part in this study and without whom the findings would not have been possible.

Funding for the project was provided by the Department of Transport, Local Government and the Regions, to whom we express our sincere appreciation. The authors also wish to thank the following groups and organisations for their support:

- Transport Research Laboratory
- British Institute of Traffic Education Research
- Child Accident Prevention Trust
- Environmental Services, Brighton and Hove Council
- Highways Department, Kent County Council
- Environmental Services, County of Herefordshire District Council
- Transport and Environment Services, East Sussex County Council
- Road Safety Department, West Sussex County Council
- Department of Road Services, Worcestershire County Council

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