A Child-based Approach to Road Safety Education for 8-11 year olds

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AA **Foundation for Road Safety Research**

BITER *The British Institute of Traffic Education Research*

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Note: The Technical Annexe relating to this report is available from the AA Foundation for Road Safety Research, Norfolk House, Priestley Road, Basingstoke, Hampshire RG24 9NY.

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ALBRSO
Association of London Borough Road Safety Officers

Analysis of Covariance
A statistical technique used in the present study to control for differences in pre-test performance when comparing the control and experimental groups.

BITER
The British Institute of Traffic Education Research

Chi-square Test
When the data consists of frequencies in discrete categories, the chi-square test may be used to determine the significance of differences between two independent groups (Siegel and Castellan, 1988).

Key stages/Ages/Year groups
In England, Wales and Northern Ireland, the curriculum is organised on the basis of four Key Stages. Scotland does not have Key Stages but uses a primary (P) and secondary (S) prefix to denote the year group. The broad comparisons are given below.

Key Stage	Age of most pupils at the end of the school year			Year Group		
	England and Wales	Northern Ireland	Scotland	England and Wales	Northern Ireland	Scotland
1	5–7	5–8	4–6	1–2	1–4	P1–2
2	8–11	9–11	7–12	3–6	5–7	P3–7
3	12–14	12–14	13–14	7–9	8–10	S1–2
4	15–16	15–16	15–16	10–11	11–12	S3–4

Kolmogorov-Smirnov Test
A test of whether two independent samples have been drawn from the same population or from populations with the same distribution. It is sensitive to any kind of difference in the distributions from which the two samples are drawn (Siegel and Castellan, 1988).

LARSOA
Local Authority Road Safety Officers Association

NAHT
National Association of Headteachers

National Curriculum
The National Curriculum (England and Wales only) applies to pupils of compulsory school age in maintained schools, including grant-maintained and grant-maintained special schools. For key stage 2 it includes the subjects – English, mathematics, science, technology (design and technology and information technology), history, geography, art, music, and physical education. In Wales the curriculum includes Welsh.

Northern Ireland Curriculum
The Northern Ireland curriculum for primary schools includes the compulsory subjects of English, mathematics, science, technology and design, history, geography, art and design, music, physical education and Irish in Irish speaking schools.

Primary
The type of school attended by most children up to the age of about eleven years in England, Wales and Northern Ireland and about twelve years in Scotland.

RoSPA
Royal Society for the Prevention of Accidents.

RSO
Road Safety Officer - usually employed by the local highway authority. One of their functions is to promote good practice in road safety education in schools.

Scottish Curriculum Guidelines 5-14
The recommended curriculum for schools in Scotland. In primary schools, the main areas of the curriculum are language, mathematics, environmental studies, expressive arts and religious and moral education.

Significance Levels
The levels quoted in the text indicate the level of probability that a relationship would occur by chance. Thus, if a significance level is quoted as $p<0.001$, only once in a thousand similar occasions should such a result be expected by chance.

Traffic Calming
A variety of engineering measures designed to reduce the speed of traffic.

T-test
A test of significance of the difference between two means.

Tukey's Honestly Significant Difference (HSD)
This test is used in making all possible pairwise comparisons between group means after a significant F statistic has indicated that one or more significant differences exist (Diekhoff, 1992).

Wilcoxon Matched Pairs Signed Ranks Test
This test may be used to compare paired samples where both the direction and the relative magnitude of the difference between the two measurements is known (Siegel and Castellan, 1988).

Year group (as used in this report and not the National Curriculum)
An approximate indication of the age of the child. Scottish children are, on average, about six months younger than their counterparts in the same Year Group in England and Wales. This difference is due to the cut-off dates for entry to primary school in Scotland, England and Wales.

Z-score
In the context of the present report, a statistical measure resulting from a test of signficance between two means.

The AA Foundation for Road Safety Research

The AA Foundation for Road Safety Research was formed by The Automobile Association in December 1986 as part of its continuing efforts in the road safety field and as a major contribution to European Road Safety Year.

Registered as a charity (number 295573), the objectives of the Foundation are:

To carry out, or procure, research into all factors affecting the safe use of public roads;

To promote and encourage the safe use of public roads by all classes of road users through the circulation of advice, information and knowledge gained from research; and

To conceive, develop, and implement programmes and courses of action designed to improve road safety, these to include the carrying out of any projects or programmes intended to educate young children or others in the safe use of public roads.

Control of the Foundation is vested in a Council of Management under the chairmanship of Kenneth Faircloth OBE with day to day activity being the responsibility of the Foundation Management Committee. The Research Advisory Group, members of which include academics, road safety practitioners and health and transport industry professionals, recommends topics worthy of research to the Management Committee.

Sponsors

Support for the Foundation's research programme is encouraged through sponsorship from companies and other bodies that have a concern for the interest in road safety. The Foundation continues to seek sponsors in order to ensure its research programme can continue beyond the year 2000. Since 1986, the Foundation has enjoyed sponsorship from many companies; those supporting our activities in 1995 are:

The Automobile Association, Amery-Parkes, BBS Productions, BT, The Caravan Club, Coopers & Lybrand, Europcar (UK), Fennemores, Herbert Smith, ICL, MSM Engineering Services, NWS Bank, Private Patients Plan, The Society of Motor Manufacturers and Traders, and R Watson & Sons.

And the following insurance companies:

AGF, Bishopsgate, Commercial Union, Corinthian Policies at Lloyd's, Cornhill, Drake, Eagle Star, Economic, Gan, Guardian, ITT London & Edinburgh, Norman, Orion Personal, Provincial and St Paul International.

Summary report

Introduction

Accidents in general are the leading cause of death in children. Up to the age of four, most fatal accidents occur in the home. Thereafter, most accidental deaths to children are caused by road traffic accidents. Road accidents are the biggest single cause of death for all children up to the age of fifteen. In 1993, 1,999 children aged 8–11 were killed or seriously injured (KSI) on Britain's roads; some 4% of all KSI casualties. Of these, nearly two-thirds (64%) were injured as pedestrians. Child road accidents tend to be an urban problem, often occurring in inner-city areas to children of ethnic minority groups.

Road user education in schools is only one of several potential countermeasures to the problem. In general, such education takes one of two forms: practical training on a real or simulated road which normally requires time outside the main curriculum, and teaching within the mainstream curriculum.

The aim of the study was to develop a road safety education resource which takes into account the ways in which children aged 8–11 years see the road traffic environment and encourages them to be part of the decision making process in keeping themselves safe. In producing the resource, it was essential to be sensitive to the needs of teachers and to ensure that the approach used was educationally acceptable.

The objectives of the study were:

i   To establish methods of listening to children and their reactions to a range of road environments and situations.

ii   To develop a road safety education resource for use in primary schools by teachers.

iii   To evaluate the use of the resource with both children and teachers in primary schools in England, Scotland and Wales.

iv   To survey the target age group on their travel patterns to school and their general road use.

Choice of study areas and sample size

It was intended that the final resource should be relevant to all parts and communities within Britain. In England, local authorities in Sunderland, Walsall, Solihull (Chelmsley Wood), Barnet and Wiltshire (Warminster) agreed to co-operate in the fieldwork for the main study. In Wales the participating authority was Powys (Rhayader), and in Scotland the fieldwork was conducted in Strathclyde (Glasgow). In addition schools from Essex, Cleveland, and Coventry were involved in the development of the resource.

The number of children participating in the study was nearly 1,600, with over 1,100 taking part in the main study.

Project stages

The study consisted of four main stages:

1   Listening to children;

2   Developing the educational resource;

3   Piloting the resource;

4   Evaluating the resource.

Listening to children

A set of activities was developed by which an insight into children's perceptions of their road environments could be obtained. It was essential that the activities were regarded as unthreatening by both children and teachers; that they were motivating to the children; and that the children would respond freely and without inhibition to the questions posed by the researchers.

The activities for the exploratory discussions included a street sounds tape, used as an aural stimulus for drawing a 'sound picture'; a set of colour photographs, used as a visual stimulus, and a short questionnaire. After initial piloting of the techniques with 48 children from four schools, some changes were made. Drawing a picture proved to be a motivating activity for younger children although the older children were more inhibited. The tape was, therefore, replaced with a local map activity. The questionnaire was modified and the use of the photographs retained. Group discussions were then conducted with a further 128 children aged 8–11 years from eight schools.

The results suggested that children tended to view the environment in terms of all potential threats to their safety, rather than just the danger from traffic. In general, children described roads as safe or unsafe because of the amount of traffic. A road perceived as busy was also perceived as unsafe. Comments were rarely any more specific than "Because it is a busy road". In some cases a road was regarded as unsafe because of an incident that had been seen, or an accident that had nearly happened. The incident was not always specific to a traffic situation. There was general agreement that children feel safe on quiet country roads, when they are with friends, and on their way to school. They also believe that they know where to find a safe place to cross the road.

When asked about what grown-ups did, the majority of the comments were concerned with unsafe adult behaviour. Around half the children said that grown-ups cross the road at a pelican crossing when the red man is showing and cross to the middle of the road and wait for traffic to go past before crossing to the other side. Drinking and driving was the most common negative behaviour mentioned by the children. It was stated 10 times in 49 comments. However, a few children did respond with positive statements, for example, "Hold my hand when we cross the road" and "They stop at red lights and wait until the people go past".

The presence of adults was often regarded as a threat, suggesting the strong influence of *Stranger Danger* campaigns. On other occasions, the presence of an adult made a particular child feel more secure. In response to how they would make themselves safer, many children were reluctant to accept personal responsibility for their own safety. The typical response was to request the installation of some engineering feature, such as traffic lights or a pedestrian crossing. Only when prompted did many children consider their own behaviour and how it might affect their safety.

Developing the resource

The approaches used to listen to children did more than provide an insight into how children viewed the road environment. It became apparent that the techniques, in particular, discussion of the photographs, were positively received by children. Issues were discussed and debated by the children and they were able to learn from one another. The success of the techniques used to listen to children became a major influence in the development of the resource.

The resource focused on the following issues:

1   the relative risks of the road environment and how to minimise risk in the traffic environment;

2   ways of taking personal responsibility for keeping safe as a pedestrian, cyclist and passenger;

3   the traffic environment of the future.

It was designed to be realistic – real situations are presented and tasks are activity based challenging children to think seriously about appropriate strategies to adopt when using the roads.

The resource consists of five elements:

1) The big book
2) Linked stimulus sheets
3) Interactive poster
4) Street sounds cassette tape
5) Notes for teachers

The big book

The *Big Book* is 600mm x 400mm (approximately A2) and printed on thick card with colourful graphics, including 10 x 8" photographs. The text includes some information and questions to think about and use as a basis for decision making discussions. There are six double pages plus the front and back cover which have been used for an illustrated glossary. It was designed to be used as a resource book for pupils to refer to and not something to which only the teachers have access. It could be made available in the classroom and/or the school library. It can also be used as part of a display. The *Big Book* is very visual, but unlike a video does not rely on the teacher to show it.

Stimulus sheets

There are twenty-four *Stimulus Sheets* which form part of the *Notes for Teachers* and relate to the double pages in the *Big Book*. Each *Sheet* can be integrated into a subject or topic and support the on-going classroom activities planned by the teacher. They are not intended to be used as handouts, although, if pupils are capable of using the sheets themselves, they can be photocopied and distributed.

Interactive poster

The *Interactive Poster* is a changing display of ten photographs. Teachers can use the pictures that they feel are best for their class. With the photographs are a set of cards containing questions to stimulate discussion. The *Notes for Teachers* also contain specific questions for the children to answer.

Street sounds cassette tape

The *Street Sounds Tape* includes a series of sounds to which children are asked to listen and then draw the picture they saw in their mind as they were listening to the tape. Their drawing forms the basis for discussion work. This activity was especially well received by teachers of 7–8 year olds. `

Notes for teachers

The *Notes for Teachers* are comprehensive, providing background information to the project and child road accident information. For each element of the resource, suggested teaching approaches are given along with discussion questions and suggestions for follow-up activities. Relevant curriculum areas are also stated. In addition a copy of *The Highway Code* and *A Highway Code for Young Road Users* was included in the pack.

Piloting the resource

The resource was piloted in four schools with ten teachers and 296 children. Two of the schools were in urban areas in the West Midlands. The others were in Wiltshire, one in a small village and the other in Salisbury. Teachers were briefed informally about the resource by the researchers. Emphasis was placed upon the different elements of the package and the importance placed upon receiving the teachers' comments after use. Little guidance was given about the teaching method or the approaches to be used. It was considered

important that teachers should be as free as possible to adapt it to their own needs and those of their pupils. The resource was left in school for one month only. At the end of this period, the schools were revisited and informal debriefing meetings with the teachers concerned were held.

The overall response to the package was very positive. The amount of work achieved by the teachers and children in a comparatively short period of time was very impressive. Several teachers recognised that the situation was unrealistic in that, in the normal course of events, there would have been much greater planning and liaison with teachers from each year group. The main criticism of the *Big Book* was the amount of text contained within it and the language that had been used. The *Interactive Poster* was highly regarded with the pictures seen to be both relevant and covering a range of road environments. In general, the *Street Sounds Tape* was found to be more relevant to use with younger children. The individual *Stimulus Sheets* provided a range of responses. It is important to note that all teachers found sufficient sheets for their own particular use. As a result of the pilot study, modifications were made to various elements of the resource, particularly the *Big Book*, in line with the teachers' recommendations.

Evaluating the resource

The aim of the main study was to evaluate the effect of teaching the resource upon children's knowledge and understanding of, and attitudes towards road safety issues. The intention was to assess both the immediate effect of the teaching and a more long-term effect. The study used a control group pre-test two post-test design. With the assistance of local authority road safety officers, schools for the main study were selected from seven areas of Britain: Glasgow, Sunderland, Walsall, Chelmsley Wood, Rhayader, Barnet and Warminster. In each case, the schools were chosen from amongst those with council estates as their predominant catchment area. In several instances, these catchment areas had serious levels of social deprivation. It was necessary to complete the study in a period of six months and within the confines of the school terms. The teaching of the resource was undertaken to the experimental group in the five to six week period between the pre-test and post-test 1. The second post-test was undertaken after a period of four months which included the school summer holidays. As far as possible, the schools were tested in the same order during each of the three tests.

The tests undertaken by the children were designed for two main purposes; to obtain a picture of their use of the roads, their thoughts about road safety and their understanding of various typical hazards and road safety features, and to detect any changes resulting from the teaching of the resource. In designing the tests, the following considerations were taken into account. The activities had to be: completed within a single lesson (usually 40 minutes); applicable to the total age range; capable of being administered to up to 40 children at a time; motivating and non-threatening to the children; and had to involve minimal writing. Based upon the experience gained during the pilot stages of the project, the following activities were used: *Using the Roads* – an 11-question survey of children's use of the roads as a pedestrian and cyclist; *Thinking about Roads* – a 14-item questionnaire in which the children responded *Yes, No* or *Not Sure* to statements largely derived from comments made by children during the discussion stage of the research; *Roads Quiz* – A multiple-choice test of road safety knowledge; *Looking at Photographs* – A series of questions based upon six photographs of typical road situations. Unlike the *Roads Quiz*, many of the questions were open-ended and required the children to consider appropriate strategies for action based upon their perception of the hazards inherent in the photographs. The younger children did not complete all parts of all the test because of time constraints. Similar test schedules were used in the two post-tests.

The results of the evaluation suggested that the teaching of the resource significantly increased the performance of the experimental group. For the *Looking at Photographs* activity, the adjusted mean score for the experimental group on post-test 1 (15.8) was

significantly higher than that for the control group (14.3). Significant differences were also found for the following sub-groups; girls, two areas of Britain (Walsall and Barnet), and Year Group 3. In all these cases, the adjusted mean score for the experimental group was significantly higher than that for the control group. Similar significantly higher adjusted mean scores for the experimental group were found for the *Roads Quiz*. Within the sub-group analysis of the *Roads Quiz*, significant differences were found for Year Groups 4 and 5 and one area of Britain (Walsall). Again, in all cases, the experimental group had the higher adjusted mean score. The results of the *Thinking about Roads* activity were more equivocal although there was some evidence of an increased sense of personal responsibility for one's own safety amongst the experimental group.

In post-test 2, the *Looking at Photographs* activity also included elements from the *Roads Quiz*. The results suggested that the experimental group had a higher adjusted mean score than the control group. Similar significant differences were observed amongst the following sub-groups; girls, and Year Group 4. The results of the *Thinking about Roads* analysis suggested that significant changes (pre-test/post-test 2) had occurred for both the control and experimental groups. These changes may be partly as a result of maturation effects, including the move up to the next Year Group in the school.

A parallel process of evaluation was conducted with the teachers who used the resource. This part of the evaluation was concerned with the organisation and presentation of the material and its acceptability for use in schools. During the experimental stage of the project the majority of teachers used the materials to support a specific road safety project. When asked how the resource would be used if it were not part of a research project, all stated that it would be integrated into the curriculum in some way, usually as part of topic planning. The topics into which the resource could be integrated varied indicating how important it is to schools to plan their own programmes. Overall, the response to the package was very positive with the *Interactive Poster* being particularly well received. The teachers found the format very acceptable. Different schools, because of both their location and their intake, will have different needs and interests and consequently their priorities will vary.

Equally important, because of the nature of the resource, teachers are encouraged to listen to children and their perceptions of the road environment. This approach is a distinctly different technique to that traditionally used to teach road safety. The most difficult concept for teachers to grasp is that there is not necessarily a distinct right and wrong answer to any particular question, but a range of possibilities along the safety continuum. For example, when visiting a school to conduct the second post-test a teacher asked for the right answer to a particular question in the *Big Book*. He went on to explain that the class were divided on the best route to take and had quite a heated debate on the issue. Apparently, the class finally decided that it depended on the circumstances at the time and discussed the issues that would affect the safety of taking one route in favour of another.

From the outset, the project was committed to involving the children in the development of the resource. The viewpoint of the children was of equal importance to that of the experts in road safety, and critical to the approach used in both the resource and the evaluative measures. The process of listening to children was intended to be the starting point for devising the resource but it also became important in the design of the evaluation measures. With hindsight, it may seem an obvious approach. Certainly, the method has previously been used by those working in health education. However, the concept of listening and discussing with children their particular problems and view of the road environment has not been part of any previous road safety research project.

Schools and road safety education

Schools have no statutory requirement to teach road safety as a specific subject but in each of the national curriculums of the countries of the United Kingdom there is a commitment to preparing children for life. As such, there is scope for road safety to form part of every child's education as the aims of road safety support the aims of the whole curriculum, but it is necessary for the opportunities to include road safety to be identified.

The curriculum expected to be delivered in primary education is extensive. To advise teachers that an additional subject or programme, which is not given specific status in a centrally designed curriculum, is their responsibility, is unrealistic. One resource will not necessarily mean that schools will write road safety education into their school policy. However, good quality, relevant and practical resources will encourage policy to be put into practice.

The resource cannot work in isolation. The promotion of road safety education and the heightening of awareness and understanding of teachers is also of importance. The development of a new resource, albeit a thoroughly evaluated package, is only one small element of a bigger picture. However, all teachers need resources and if good quality and attractive road safety resources can be produced that meet both educational and safety objectives, then it is more likely to be acceptable to schools, teachers, children and parents.

Children's use of the road

The *Using the Roads* survey was devised to provide background information to the project but, in itself, has provided important and useful data. Administered to 1,122 children in the pre-test, the survey provided detailed information on children's use of the roads, analysed by age, sex and area of Britain. Boys were more likely than girls to walk by themselves to and from school, cross all roads on their own and play out in the street most days. Girls were more likely to walk to and from school with an adult. With increasing age, both sexes were more likely to be unaccompanied by an adult to and from school and cross all roads nearby. They were less likely to ride their bike most days.

Patterns of use of the roads varied widely between the seven test areas of Britain. Overall, the most frequent journey type to school was to walk with an adult (29%). Three other methods (walking on own, walking with friends, and going by car) had similar incidences (19%). The frequency of walking with siblings (either younger or older) was lower (11%). Few children in this sample travelled either by bus (4%) or by bike (0.4%). In Sunderland and Rhayader, the most frequent method was by car. Rhayader was the only area in which going by bus was a significant journey mode. Around two children in five (41%) cross only the nearest road to their house by themselves. Over a quarter (28%) cross all the roads nearby by themselves. The most supervised children appear to be in Barnet where a third (34%) cross no roads on their own and only 8% cross all roads. In contrast, in Sunderland, only 16% cross no roads and 15% cross all roads. About two children in five (40%) play out in the street most days. A third (34%) play out sometimes and the remainder play out hardly ever or never. Playing out is most popular in Sunderland and Chelmsley Wood (56%) and least likely in Warminster (29%).

About 85% of children owned a bike; the rate varied from 76% in Barnet to 95% in Sunderland. About a third of children (31%) claimed to ride their bike most days. A further 47% said that they rode their bike sometimes. Children in Rhayader appeared to make most use of their bikes – 54% of bike owners there said that they rode their bike most days. In contrast, only 24% of children in Barnet and Sunderland claimed the same level of usage. Most children (56%) said that they rode their bike on the roads. A quarter (25%) rode them on the pavement and the remainder only rode away from roads. The highest usages on the road were in Sunderland (76%) and Warminster (73%); the lowest in Rhayader (32%) where the rural area may provide more scope for riding away from roads. Nearly half (46%) of those children who owned a bike also owned a cycle helmet. Ownership was highest in Rhayader (74%) and Warminster (70%) and lowest in Chelmsley Wood (24%). Over half the children (56%) claimed to wear their cycle helmet always when riding their bike in the

street. The highest claimed wearing rate (71%) was in Rhayader – the range in the remaining areas was 49–59%. The lowest wearing rate appeared to be in Glasgow where a third of children (33%) claimed that they hardly ever wore their cycle helmet. Combining the ownership and wearing rates for cycle helmets, it would appear that only around a quarter of bike owners (26%) always wear cycle helmets when riding in the street. The contrast between Rhayader (54%) and Chelmsley Wood (12%) is particularly striking. There was a wide variation in the mean ages at which children thought that they would be able to cross all roads safely on their own. The lowest age was in Sunderland (10.1 years) and the highest in Barnet (12.9 years).

Achievements   Techniques, new to road safety education, have been developed to listen to children and obtain their reactions to a range of road situations.

A new teaching resource for 8–11 year-olds, which is both acceptable to teachers and fits the national curriculums of the United Kingdom, has been developed.

A rigorous evaluation has demonstrated that the teaching of the resource has beneficial effects upon children's knowledge of the safer strategies to adopt as road users.

The study has furthered the understanding of both children's use of the roads and their perceptions of the road environment.

Chapter 1   The project

1.1 Introduction

Accidents in general are the leading cause of death in children. Up to the age of four, most fatal accidents occur in the home, but after age five most accidental deaths to children are caused by road traffic accidents. Road accidents are the biggest single cause of death for all children up to the age of fifteen.

The modern road network is complex and it is not possible to provide children with a simple drill or a code to be memorised which covers all eventualities. It would seem unrealistic to expect children to develop the decision-making skills needed to be a safe road user through sheer exposure to traffic and a set of rigid rules to follow. It is important that children learn the road skills that are appropriate for their local road environment, but it is also necessary for them to be aware of how road environments change and that the strategies needed to cope safely are dependent upon circumstances. Road safety education is one of several countermeasures to child road accidents. The last major evaluated road safety education resource produced for primary schools was published in 1977.

With the passing of the Education Reform Act 1988, and the introduction of the National Curriculum in England and Wales new opportunities exist for both the style and content of road safety education. Similarly, in Scotland the Curriculum Guidelines set out the learning and teaching for the age range 5–14. The Education Reform Order 1989 (Northern Ireland) sets out the principle curriculum requirements for all pupils in grant-aided schools.

The title of the project includes the phrase "a child-based approach". This was deliberate; so often road safety has been concerned with telling children what to do, or more usually, what not to do, an approach which would seem to promote safety as a negative experience. The do's and don'ts may, of course, conflict and we may not even be sure that the child has understood the message.

Many primary school children will have learnt the Green Cross Code. However, by the time they reach secondary school, their crossing strategies are changing and many have adopted adult strategies (Routledge *et al.*,1971, Clayton *et al.*,1991, van der Molden, 1981). It was, therefore, considered important to obtain some understanding of the typical levels of knowledge and road user perceptions of this age group as well as their attitudes towards safety, plus an indication of the behavioural strategies adopted by children.

1.2 Aim and objectives

The aim of the project was to develop a road safety education resource which takes into account the way children aged 8–11 years old see the road traffic environment and encourage them to be part of the decision making process in keeping themselves safe. In producing the resource it was essential to be sensitive to the needs of teachers and for the approach used to be educationally acceptable.

The objectives of the project are:

i   To establish methods of listening to children and their reactions to a range of road environments and situations.

ii   To develop a road safety education resource for use in primary schools by teachers.

iii   To evaluate use of the resource with both children and teachers in primary schools in England, Scotland and Wales.

iv   To survey the target age group on their travel patterns to school and their general road use.

1.3 Road accidents involving 8–11 year-old children

In 1993, 1,999 children aged 8–11 were killed or seriously injured (KSI) on Britain's roads; some 4% of all KSI casualties (Department of Transport, 1994). Of these, nearly two-thirds (64%) were injured as pedestrians. Nearly one in five (18%) were pedal cyclists and almost all the remainder were car passengers. In 1992, 73% of all accidental deaths to 8–11 year old children were as a result of road traffic accidents.

Figure I.1
Child road casualties by age group – all severities: Great Britain 1993
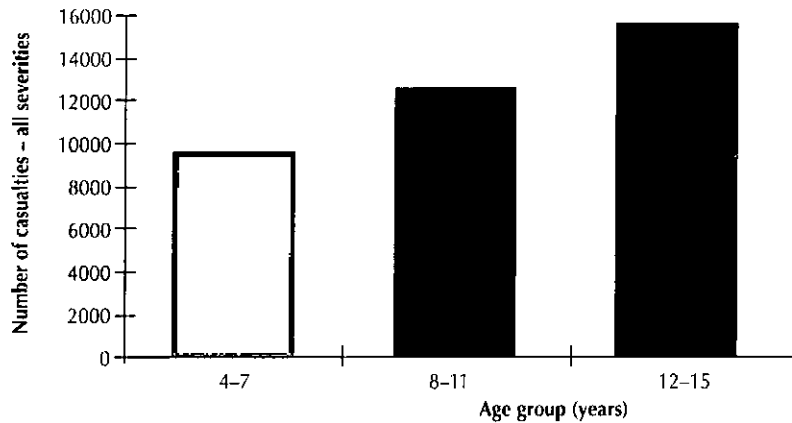
The 8–11 age group forms the second highest of the four-year age groups for road casualties (Figure I.1). The trend amongst pedal cyclists is upward; they reach their peak in the early teens. Casualties to car occupants remain relatively constant and low until the age of 14.

Both the incidence and rate (per 100,000 population) of child road casualties tends to increase with age, reaching a peak in the 12–15 year age group. The single year peak tends to occur at age 12 when, typically, children move from primary to secondary school.

The total for all child road accident casualties in 1993 was 15% lower compared with the 1981–85 average. Child pedestrian casualties are dropping and are now 53% lower compared with the base line average. Internationally, Britain has an enviable record in comparison with other OECD countries in terms of its child road deaths per 100,000 population (O'Reilly, 1994). However, its rate for child pedestrian deaths is amongst the worst in the OECD.

1.4 Conduct of the study

Before the resource could be written or any fieldwork conducted it was necessary to gain the support of a number of organisations and plan the structure of the project. The nature of the study involved a considerable number of people in local authorities and, in particular, in schools. The administrative and liaison process was set in the initial stage (Table 1.2).

1.4.1 Choice of local authorities for fieldwork

A fundamental principle of the research protocol was that the choice of local authorities should reflect the diversity of British society and its environment. [A decision was made to exclude Northern Ireland on the basis of cost]. The reasoning behind this principle was to ensure that the final resource is relevant to all parts of and communities within Britain. It was not the intention that the sample of children should be representative, in the statistical sense, of the population of 8–11 year olds in Britain. Within the constraints of the sample size, it was intended that the sample should represent the:

    three countries (England, Scotland, and Wales)
    North, Midlands and South of England
    urban, suburban and rural environments
    ethnic minorities

The project

In an attempt to reflect the above characteristics, the following local authorities agreed to co-operate in the fieldwork for the main study.

Strathclyde Regional Council (Glasgow)
Sunderland City Council
Walsall Metropolitan Borough Council
Solihull Metropolitan Borough Council (Chelmsley Wood)
Powys County Council (Rhayader)
London Borough of Barnet
Wiltshire County Council (Warminster)

In addition, schools from Essex County Council, Cleveland County Council and Coventry City Council were also included in the exploratory discussions and the piloting of the resource.

1.4.2 The sample size

For the main study it was envisaged that a sample of over 700 children from about 14. schools would be selected. This would take into account lost data and would ensure a final sample of over 450 children who would complete all stages of the research. The number of children participating in the main study was, in fact, 500 from the seven control schools and 622 from the nine experimental schools.

It was of critical importance to the success of the project that the end-users of the resource feel that they have played a significant role in its development. The whole project involved 30 primary schools. Thirty two teachers were directly involved in teaching the resource. Other teachers were indirectly involved at the stage of listening to children.

Table 1.1
Schools participating
in the project

Activity	School	Local Authority
Listening to children – exploratory discussions	Edgwick School Mildmay County Junior School Lawford Mead County Junior School Margaretting Primary School	Coventry Essex Essex Essex
Listening to children – discussion groups	Deansbrook Junior School Bankfields Primary School John Shelton Junior School Bennetts Well School Llanidloes Primary School Alumwell School Potterne School St Martin's C.E. Junior School	Barnet Cleveland Coventry Solihul Powys Walsall Wiltshire Wiltshire
Piloting of the resource and evaluation measures	Wood End Junior School Windy Arbour Primary School Monkton Farleigh C.E. Primary St Martin's CE Junior School	Coventry Solihull Wiltshire Wiltshire
The main study	Grahame Park Junior School Blessed Dominic Junior School Crossgates County Primary Rhayader C.W. Primary School Coleshill Heath Junior School Yorkswood Junior School St Clare's Primary School St Bartholomew's Primary School St Brigid's Primary School Hylton Red House Primary School Fulwell Junior School Chuckery Junior Mixed School Alumwell Junior School Dorothy Purcell Junior School Princecroft County Primary St John's C.E. School	Barnet Barnet Powys Powys Solihull Solihull Strathclyde Strathclyde Strathclyde Sunderland Sunderland Walsall Walsall Walsall Wiltshire Wiltshire
In total 1,594 children aged 8–11 years old took part in the project.		

1.4.3 Establishment of an advisory group and liaison with other organisations

Many road safety practitioners have significant experience in primary education, child safety or road safety education, experience which can make a valuable contribution to the success of the final product.

At the start of the project, details were sent to the Secretaries of the Road Safety Officer organisations (LARSOA and ALBRSO). Supportive replies were received from them, together with suggestions as to which road safety officers had particular expertise or interest in this area. These nominations formed the basis of the advisory group and included representation from England, Scotland and Wales. Two members of the advisory group were former primary school headteachers. The National Association of Headteachers was also represented.

The advisory group formally met on two occasions at critical stages of the project, but informal meetings between BITER and members of the group took place throughout the study.

The following Government Departments and other organisations were informed of the project:

Department of Transport   Health Education Authority
Department for Education   Scottish Road Safety Campaign
Department of Trade and Industry   Child Accident Prevention Trust
Department of Health   Transport Research Laboratory
Scottish Office   Royal Society for the Prevention of Accidents
Welsh Office

Table 1.2
Project stages and
timescale

Stages	Outcomes	Timescale
Setting up the project	i Literature review ii Accident data review iii Agreement gained from participating local authorities iv Advisory Group established	January 1993 – February 1993
Listenting to children	i Pilot materials prepared ii Exploratory discussions conducted in 4 schools with 48 children iii Modification of discussion techniques iv Discussions conducted in 8 schools with 128 children v Results collated vi Advisory Group meeting	March 1993 – August 1993
Development of the resource	i Draft resource written ii Resource piloted in 4 schools iii Teachers' evaluations collated iv Revision and rewrite of the resource in line with teachers' comments	September 1993 – March 1994
Development of the evaluation measures	i Pre-tests and post-tests conducted with 296 children ii Test results collated and analysed iii Modifications made to the tests	September 1993 – March 1994
The main study	i Pre-tests conducted in 9 experimental schools and 7 control schools with 1,122 children ii Teacher briefings conducted and resource used in 9 experimental schools iii Post-test 1 conducted with 980 children iv Post-test 2 conducted with 910 children v Advisory Group meeting	May 1994 – December 1994
Final report	i Collation and analysis of data for report	January 1995 – April 1995
Resource production	i Revision and development for production	May 1995 – August 1995

4

Chapter 2   The context

2.1 Introduction

The context for developing a new resource is concerned with both the nature of road traffic accidents in which 8–11 year old children are involved and the circumstances that exist in schools. In addition, consideration must be given to preparing children for the transfer to secondary school, increased independence in the road environment and ways of encouraging personal responsibility. There was not scope within this project to explore the parental views of road safety; the focus is upon the children and their teachers.

2.2 Research on child road traffic accidents

Studies of road accidents involving 8–11 year olds can provide useful information about when, where and to whom these accidents occur. Much less information is available on the causation of such accidents. The emphasis is upon pedestrians rather than other road users.

One of the first child pedestrian accident studies in Britain was undertaken by Grayson (1975) in Hampshire. His main findings can be summarised as follows. In terms of journey purpose, going to and from home accounted for one in three (34%) casualties and going to and from school for one in six of casualties to school-age children (5–14). Playing decreased sharply from one in three for the under 5s to one in 14 for the 10–14 year olds. Distance from the accident site to home increased sharply with age. Even so, two in three of the accidents to 10–14 year olds occurred within half a mile of their homes. The great majority of children were very familiar with the road. Nearly half (no age breakdown) said that they crossed it every day or every school day. The proportion of children who were alone at the time of the accident increased with age to 54% amongst the 10–14 year olds. Conversely, the proportion who were with an adult decreased dramatically from 38% amongst the under 5s to 4% amongst the 10–14 year olds. Crossing in groups was a major feature (40–50%) amongst 5–14 year olds.

As part of a study of urban accidents, Kirby et al. (1989) investigated 166 child (under 14 years) pedestrian accidents. Because of the small sample, no breakdown by age group was undertaken. A comparison with Grayson's all age data shows some remarkable similarities. The major differences related to whether or not the child stopped at the kerb before crossing and whether or not he/she saw the vehicle before impact. The collection of data on both these issues is inevitably more difficult and subjective and the observed differences may be due largely to the differences in methods of data collection and interpretation.

Table 2.1
Comparison of some results from Grayson (1975) and Kirby et al. (1989)

Variable	Grayson	Kirby et al.
Alone at time of accident	44%	37%
With adult	12%	10%
Playing in/near road	18%	14%
Did not stop at kerb	57%	33%
Did not see vehicle	90%	73%

The two studies used different techniques for determining the causal factors. To the extent that Kirby et al.'s cognitive error can be equated with Grayson's misjudgement, the results are very similar (7% and 8% respectively). However, Kirby et al. assigned only 61% of accidents to perceptual errors (26% were designated unknown error) whereas Grayson assigned 90% to a partial or complete lack of attention (and only 3% to unknown).

Lawson (1990) undertook a specific study of young (under 20 years) pedestrian accidents in Birmingham. Detailed data were obtained on 51 fatalities and 417 serious injury accidents. His fatality data confirmed Grayson's findings that most of the children knew the road well, that the distance of the accident site from home increased with the age of the victim, and

that the pedestrian was wholly or mostly at fault. The results highlighted the occurrence of accidents in areas of greatest population density such as inner city areas. This finding was particularly true for younger (under 10 years) casualties. The higher incidence of disadvantaged children was also shown by Lawson (1990). This result is not peculiar to Britain; similar findings have been reported for elsewhere in Europe (Deschamps 1981, van der Molen 1981) and the United States (Rivara 1990). It is critical, therefore, that any proposed educational programme forms part of the normal school curriculum. Optional programmes tend to self-select children and families who are least at risk.

A study in Scotland (Scottish Office, 1989) of around 400 pedestrian accidents revealed a broadly similar picture. Children from social classes D and E tended to be over-represented in pedestrian accidents. Across all age groups, the environmental features associated with accidents were junctions, parked cars, fast traffic and bends. Older children (over 9 years) tend to be associated with accident sites with fast traffic, a reflection, probably, of their greater mobility. An attempt was made to judge the safety of the chosen crossing place. Half the accidents occurred at 'good crossing places', implying that road crossing skills are not well developed. Around 40% occurred at 'bad crossing places', although a better place to cross was available in around 70% of cases, implying that children were not making the best use of available and safe opportunities. Unfortunately, these data were not analysed by age except for showing that 5–7 year olds tended to be more likely to select 'good' places to cross.

Lynam and Harland (1992), in a review of international child pedestrian fatality rates, found that the level of urbanisation was a major factor in determining accident rates. Britain has a particularly high level of urbanisation in comparison with many other European countries. Higher road casualties were also reported amongst lower socio-economic groups and ethnic minorities, many of whom live in inner cities, areas of high residential density and old road layouts.

2.3 Attitudes of 8–11 year old children towards road safety

Many of the studies reviewed here relate to safety in general rather than specifically to road safety. As will become evident, children tend not to categorise safety into its various components, such as road, water, and home.

Children aged 8–11 rate safety in traffic fairly high in terms of health education topics although water and home safety are seen as more important (Balding, 1988). Girls tend to rate traffic safety less highly than boys. Both sexes rate caring for pets as the most important health-related issue.

Another study (Department of Trade and Industry, 1991) showed how children's perceptions of safety develop with age. By the age of 8–11, they have a much broader view of the dangers they face. They are able to quote many codes of behaviour they have been taught and identify further preventive strategies which could be employed. They rely on adults less and increasingly consider that they are responsible for themselves and the safety of others. They can distinguish between avoiding and coping strategies for dealing with hazards.

Williams *et al.* (1990) reviewed children's perceptions of five key areas of health education, including 'keeping safe'. They concluded that the majority of young children below the age of nine do not see themselves as responsible for their own safety. Children also hold a very broad view of keeping safe which includes a whole range of activities and situations. This view includes people, places and objects and includes avoiding situations of panic or turmoil, such as parental wrath, as well as possible physical harm.

This holistic view links with Van Vliet's (1983) observation that the environment of shops, parks, streets, cafés and the like (what the author terms the fourth environment) is coded and used very differently by children. They view such locations in terms of parental

approval, of the presence or absence of significant peers, of their feeling of competence, and of other potential dangers which may not be apparent to adults.

In a general study of safety issues, Scott *et al.* (1992) undertook group interviews with teenagers living on a Glasgow housing estate. They found that talk about the risks of accidents tended to be interspersed with talk about the risk of crime. When talking about accidents, the teenagers changed the subject to talk about fights. Accident prevention and crime prevention were talked about interchangeably.

Children's attitudes to and perception of risk may be relevant to their attitudes towards road safety. Walesa (1977) used a pictorial technique to study the development of the perception of certain risk categories in 6–18 year olds. He found that the lowest perception of risk in hazardous situations occurred amongst 8–11 year olds.

Hargreaves and Davies (1992), in their review of Walesa's paper, suggested that 8–11 year olds are aware of the overall possibilities of risk in the scene as a whole but do not consider any of them in detail. Younger children perceive greater levels of risk because they rely on individual components of the scene rather than viewing it as a whole and older children are much more aware of hazardous details.

Dickson and Hutchinson (1988) examined children's awareness of and potential response to property risks (loss of or damage to property) or life risks (causing personal injury). Data from 289 boys and 296 girls (aged 9–12 years) in Scotland indicate that (a) subjects were more aware of life risks than property risks; (b) subjects responded more appropriately to potential property risks than to potential life risks; (c) girls were more aware of life risks than the boys, but there was no difference between boys and girls in terms of their behaviour toward potential life risks; and (d) there was no difference between boys and girls in awareness of property risks or anticipated behavioural response to potential property risks.

Hargreaves and Davies (1992) have suggested that the readiness to undertake risks where the anticipation is of pleasure rather than pain is particularly strong when the children operate in groups or gangs. They consider that there can be strong competitive and peer group pressures to take risks in front of friends. Peer pressures have been shown to be relevant in several studies. Bergman *et al.* (1990) referred to the 'nerd factor' as one of the main factors in children's resistance to wearing bicycle helmets.

The parent's views on the capabilities of their children may also be a factor. At least one study has suggested that parents consistently overestimate the crossing abilities of their children, particularly at younger ages (Dunne *et al.*, 1992). This over-estimation, if perceived by children, may result in overconfidence and hence higher risk.

2.4 Road user behaviour patterns of 8–11 year-old children

The literature appears to concentrate almost exclusively upon road crossing behaviour. The early workers in this field, notably Sandels (1975), considered that, below the age of 10, "children do not have the sensory or cognitive ability to cope with modern traffic". This view has been largely discounted over the past 15 years as it has been shown that children below the age of 10 can cope, albeit not always perfectly, with many if not most traffic situations. The most accurate information on actual road crossing behaviour comes from unobtrusive studies of behaviour. In a review of the literature, van der Molen (1981) found the following age effects:

Running: The percentage of pedestrians running during approach to the crossing decreased with age;

Stopping: Most studies found that stopping frequency decreased with age;

Kerb delay: In general, the mean time spent at the kerb before crossing decreased with age;

Gap chosen: Older children tend to accept any size of gap more often than younger children. Apart from running, none of the other variables can be said to relate directly to

safe behaviour. All changes could be explained in terms of more efficient information processing and decision-making processes without necessarily changing the level of safety of the crossing behaviour.

There is some evidence to suggest that the incidence of overall safe crossing behaviour increases with age. Routledge *et al.* (1971) found that, on both major and minor roads, children aged 7-11 were rated as exhibiting significantly more cautious or safer behaviour than children under seven. However, van der Molen (1981) suggested that this relationship was an artifact of the traffic conditions experienced by different age groups. Younger children may have been observed relatively more frequently in quiet streets. If, as Clayton *et al.* (1991) found for 12-13 year olds, hearing the sound of traffic significantly affects the probability of either looking or stopping at the kerb, then the age relationship found by Routledge *et al.* may, in reality, be a function of traffic flow.

One of the largest recent studies of this type was undertaken in Scotland (Scottish Office, 1989). Over 10,500 children were observed at 130 randomly selected sites in central Scotland. Of these, around 7,500 actually crossed the road. In general, the children's road behaviour was considered to be poor. Only around one third of children (35%) stopped at the kerb. Some 17% paused, but the remainder (nearly 50%) neither stopped or paused. Over half the children (52%) looked in neither direction before crossing. Only 15% looked in both directions. Only some of the factors are analysed by age. The age of the children was estimated by the observers. As far as is known, no independent check of the observers' abilities to estimate age was undertaken. It should also be noted that the data are presented largely in terms of percentages. No statistical tests were applied to the data. Adult guidance decreased with age from around 10-11% at age 3-6 to 5-7% at age 8-11. With increasing age, children appeared more likely to look before crossing although the proportion who stopped at the kerb did not appear to change. The incidence of running across the road decreased as did emerging from behind a parked vehicle.

These relationships with age are confirmed by the results of other studies. Using a questionnaire, Demetre and Gaffin (1994) found that 21% of eight year olds and 36% of ten year olds crossed roads alone compared with only 2% of six year olds. They also found that, under test conditions, the frequency of choosing to cross from behind a parked vehicle rather than from a clear view crossing point, decreased with age. A further correlation was obtained between previous experience of crossing roads alone and the choice of a safe crossing point.

Under controlled conditions, Ampofo-Boateng *et al.* (1993) compared the ability of children aged 5-11 to choose safe crossing points. The older children (9 and 11 years) showed far more awareness of what constitutes a safe or a dangerous route and were much more likely to take appropriate action to reduce the risk, for example by moving down the road to a safer spot. Only at this age do children seem to have developed some skill in recognising the danger of inadequate vision of the road and adopt a successful strategy to overcome it.

2.5 Road safety education as a countermeasure

In 1987, the Department of Transport published the result of an Inter-Departmental Review of Road Safety Policy, *Road Safety – The Next Steps* (Department of Transport, 1987). This review involved all Government Departments having influence in the field of road safety policy. The Government accepted the Review's conclusion of establishing the overall objective of reducing road casualties to two thirds of their 1981-85 average level by the end of the century. The review concluded that education had a major role in achieving this target.

Local Authorities have the statutory responsibility for road safety and their document *The Road Safety Code of Good Practice* (Local Authority Associations, 1989) recognised that reducing casualties required a multi-disciplinary approach. The work of road safety practitioners in engineering, education and enforcement all have a potential contribution to the attainment of the objective of casualty reduction. They recommended that a planned

and co-ordinated road safety education programme within the curriculum of all primary and secondary schools should be encouraged.

The Department of Transport initiated a major research project following the Government's review. The project, carried out over five years in two local authorities in England, set out to develop ways of teaching road safety in schools. The project produced four documents, *The Good Practice Guidelines* (Department of Transport, 1995), which present ideas for setting up in-service training, the role of a range of organisations concerned with road safety and ideas for the use of road safety education in different subjects and amongst different age groups.

The main conclusions of the research project included:

- Road safety education enhances the teaching of the core curriculum by providing a context which relates to the every day experience of the pupils.
- Children need to receive small, frequent, regular and purposeful inputs of road safety education throughout their school careers.
- Teachers are best placed to deliver road safety education in schools.
- Road Safety Officers should take the lead in promoting good practice in road safety education.
- Road safety education is best advanced by raising teachers' awareness of its breadth of opportunities rather than by using shock tactics about the scale of the casualty problem.

The evaluation of this project concluded that when schools gave higher priority to their road safety education programme and placed more emphasis on road safety issues, the pupils learnt more and became more safety conscious. The Guidelines also recognised that the development and implementation of road safety education in schools has been constrained, in part, due to the major changes that have taken place in the management and organisation of education. In addition, it also identified "a lack of tested teaching material for integrating road safety into the National Curriculum". In fact, the last major evaluated road safety education package for 8–11 year olds was produced nearly twenty years ago (Jolly, 1977).

2.5.1 Objectives of road safety education programmes

Van der Molen *et al.* (1981) suggested that the general goal of road safety education should be that children must be able to select situations that offer maximal safety and to behave as safely as possible in these (and other) situations. In a further analysis of this broad definition, Van der Molen (1981) outlined five groups of factors that affect the likelihood of a pedestrian accident:

1 Personal factors (chronological or mental age, sex, personality, educational background, physical development)
2 Social factors (journey purpose, accompanied or not)
3 Environmental factors (eg weather, road type, pedestrian facilities etc)
4 Traffic (the presence and behaviour of other road users)
5 Behaviour of the child (as determined by the other four factors and the way other road users react to the child).

On this basis, he defined the purpose of road safety education as an attempt to induce changes in the personal variables of a child (Factor 1) that result in a change in the kind and frequency of certain behaviours (Factor 5). The educational objective also implies that a child is taught to appear less often in particular roadway situations (Factor 3) and traffic intensities (Factor 4) and more frequently elsewhere. Such a definition is useful in that it demonstrates the complexity of the issue. However, it is difficult to see how road safety education can influence all the personal variables listed under Factor 1. Only personality and educational development would appear potentially feasible. Age, sex and physical development cannot be changed by road safety education!

Other authors, such as Rothengatter (1981), have emphasised the need to set specific behavioural objectives based upon the task analysis of a particular manoeuvre such as crossing in a quiet street or in the vicinity of parked cars. However, as Hargreaves and Davies (1992) have pointed out, safety procedures that stop at the acquisition of a role or response are likely to grossly underestimate the degree to which such learning may be transient and context bound. Much learning remains anchored to a particular time and setting and fails to be copied appropriately in new situations. Grayson (1981) similarly advocated that helping a child to cope with the road conditions that he/she actually experiences should be given a higher priority than the prescription of general principles.

It would appear important to distinguish between:

a) learning an appropriate behavioural response to a specific situation and being able to repeat it under test conditions; and

b) applying that response regularly and correctly in real life.

There is an implicit assumption in many research papers that the acquisition of the skill is sufficient to ensure its regular use and hence the safety of the user. Michon (1981) took a more extreme view when he stated that whether or not a person will choose to behave safely in traffic is in fact immaterial for the pertinence of road safety education.

Rothengatter (1981) considered that the formulation of concrete objectives based upon task analysis data was the minimum necessary for an educational programme. He did concede, however, that there are other cognitive and affective objectives that could make the achievement of these formulated objectives more likely. He suggested the following list of secondary objectives:

> Can distinguish between safe and unsafe behaviour;
> Can distinguish potentially safe and dangerous situations;
> Is prepared to follow traffic instruction and training;
> Is prepared to perform the learned traffic behaviour;
> Recognises the importance of safe behaviour in traffic;
> Regards safe traffic behaviour as important.

For 8–11 year-old children, who have through training or experience learnt many behavioural responses to traffic situations, the achievement of these secondary objectives would appear to be particularly critical. This view is in line with the 'whole systems' approach advocated by Hargreaves and Davies (1992), an approach which takes account of the characteristics of the individual, his/her social background as well as features of specific risk situations.

2.5.2 Resources

Ultimately it is children who should benefit from use of a new resource, ideally as part of a planned programme. Children will be the end-users, but their participation is dependent upon their teacher and the school policy. The importance of the parental role cannot be under-estimated, but it is schools which can provide the organisation for structured learning activities. Such activities need not preclude parents and there is scope for encouraging such involvement.

The last major evaluated resource for this age group was *Children and Traffic* (Jolly, 1977) It consisted of three very comprehensive books for teachers covering the primary and lower secondary age range. Accompanying the books were sets of workcards and copiable sheets for use by pupils. The approach taken in this resource was to encourage teachers to integrate activities in their normal classroom activities. Practical approaches were included and activities which involved children learning in the real road environment. It was not an approach based solely upon classroom learning, neither was it dependent upon the recitation of the Green Cross Code. This resource is no longer being produced, in terms of

presentation and acceptability to teachers it is somewhat dated. However, the principles of integration and teachers being involved with road safety education are still relevant today.

Other resources have obviously been produced for the primary age group by Local Authority road safety units and organisations such as BITER and RoSPA since 1977. However, not all resources have undergone a rigorous evaluation. *Streets Ahead,* a series of four modules (Royal Society for the Prevention of Accidents, undated), used an approach similar to *Children and Traffic* in that it adopted a wider view of road safety education. Schools were involved in its development and the activities were educationally acceptable.

For the younger age group, 5–8 year olds, a project developed by the Transport Research Laboratory took a practical approach. It began with the premise that children learn best by being in the real situation, and the emphasis is on practical experience under the guidance and supervision of responsible adults. The focus of the programme is on traffic trails with special emphasis on 1) Safe places to cross and 2) Identification of a safe route. The project also promoted follow up classroom activities. It is now being used in schools under the title *Let's Decide – Walkwise* (Royal Society for the Prevention of Accidents, 1993)

Within the last ten years the culture and climate for the integration of road safety education into the school curriculum has improved. Local Authorities have produced their own guidelines for their schools and changes in the education system have created opportunities for a more planned approach. Evaluated resources provide teachers with practical tools for implementing road safety education, and can provide a bridge between policy statements and practice. Ease of use, relevance and attractiveness of resources is of prime importance to teachers. It is also vital to market the resource and the concept of road safety to teachers directly both through road safety practitioners and as part of initial and in-service training.

The major outcome of the present research project is an educational resource for use in schools by children aged 8–11 years old. The objectives will be specific to the resource. There is a distinction between objectives given in a resource and those specifically devised for a localised programme. The resource may form part of a programme in a school, but is not necessarily the programme itself.

In addition to deciding upon the road safety objectives to be met in the resource and the activities which can meet those objectives, consideration also had to be given to the educational context in which the resource will be used.

2.6 The education background

The production of any resource must take into consideration the circumstances that exist in schools at present. This is particularly apposite for road safety, which, does not exist as a subject but is a vital life skill. As such, it is too important to leave to incidental chance or the occasional video and talk.

Individual schools are required to produce development plans which are approved by governors. The greater involvement of governors, increasing individual school accountability, and the central role that teachers have in delivering and evaluating the curriculum cannot be ignored when encouraging road safety education in primary schools.

Schools are pragmatic places. Vague and theoretical approaches alone are unlikely to be received with great enthusiasm. One resource will not necessarily mean that schools will write road safety education into their school policy. However, good quality, relevant and practical resources will encourage policy to be put into practice.

The curriculum expected to be delivered in primary education is extensive. To advise teachers that an additional subject or programme, which is not given specific status in the centrally designed curriculum, is their responsibility, is unrealistic.

2.6.1 The curriculum – problem or opportunity

If teachers are to incorporate road safety education into the curriculum, their broader educational concerns and needs cannot be disregarded. The aims of the National

Curriculum for England and Wales and the Scottish Curriculum Guidelines 5–14 do not conflict with the broad aims of road safety education. The essential difficulty is for teachers to recognise the practical opportunities to include road safety education in the curriculum.

Since the Education Reform Act (1988) many changes have taken place in both the functional organisation of schools and the curriculum to be taught. School management and financial control in England and Wales, and to a lesser extent in Scotland, is being devolved from local education authorities to the schools themselves. Even small primary schools are now concerned with local management.

When the Education Reform Act (1988) was passed, the first section established general principles which were to be reflected in the curriculum of all pupils. In effect, it entitled all pupils to a curriculum which is balanced and broadly based, which;

(a) "promotes the spiritual, moral, cultural, mental and physical development of pupils at the school and of society"; and

(b) "prepares such pupils for the opportunities, responsibilities and experiences of adult life".

Two of the aims for primary education in Scotland (Scottish Education Department, 1989) are that pupils should acquire and develop an:

"Understanding and appreciation of themselves and other people, and of the world about them."

"Appreciation of the benefits of healthy living and of physical fitness."

The opportunity for integrating road safety education into the curriculum exists in the framework developed for primary education. There are, undoubtedly, aspects of road safety which form a relevant part of some subjects, providing a 'real world' situation for pupils to learn.

The contribution of teachers to road safety education is vital. Without the resources and accompanying in-service training to build confidence and expertise they cannot be expected to make that contribution.

The National Curriculum (England and Wales) has undergone many changes over the last five years. In 1994 the School Curriculum and Assessment Authority (SCAA) undertook an extensive formal public consultation which resulted in the Dearing report *The Review of the National Curriculum* (Schools Curriculum and Assessment Authority, 1994).

As a result of the consultation process, the new National Curriculum Orders slimmed down the content of the curriculum to release the equivalent of one day a week of curriculum time in primary schools to use at their own discretion. In addition, it re-emphasised that how the curriculum should be taught is decided by individual schools. It avoids the suggestion of particular methodologies and applies as much to individual, group or investigative work as to other teaching methodologies.

2.6.2   The whole curriculum

The subjects which make up the curriculum will be augmented by an accepted range of cross-curricular elements. In England and Wales these are; Economic and Industrial Understanding, Careers Education and Guidance, Health Education, Education for Citizenship and Environmental Education.

Safety education is a strong element within Health Education and road safety is also an important part of Environmental Education and Education for Citizenship. Schools are likely to use a variety of approaches to include these cross-curricular themes in the curriculum. The advantages of teaching them through the subjects is that a place is secured within the statutory curriculum and all teachers take some responsibility for aspects of the work.

The context

The issues of whole curriculum planning was raised in the Dearing Report by many respondents as a particular area of concern, especially in primary schools. Many respondents sought clarification on the role of the cross-curricular themes within whole curriculum planning. To support schools in this critical area SCAA is planning to produce advice on whole curriculum and assessment planning for primary schools.

The Dearing Report also drew attention to Section 1 of the Education Reform Act 1988 and argued that schools should be free to make their own decisions on how to achieve breadth and balance in the curriculum and that the reduced statutory requirements of the National Curriculum allow greater discretion to achieve these ends.

The framework for the National Curriculum is subject based and assessment is currently dependent on pupils' level of attainment in the various subjects. However, the primary curriculum is delivered in a variety of ways. For example, class teaching, team teaching and specialist subject teaching. Topic work may feature strongly in some schools; in others, subject teaching may be more evident.

The central aim of Environmental Studies in the Scottish Curriculum Guidelines 5–14 is:

"Through experiences provided and organised for the purpose, pupils should achieve knowledge and understanding of the environment, develop positive attitudes to it and skills which enable them to interact effectively with it."

Clearly, integration within the curriculum must be relevant. Equivocal links and objectives are unlikely to succeed in meeting road safety or curriculum objectives.

2.6.3 Methods of teaching

Teachers are individuals and are unlikely to respond positively to one single method of teaching. Even though the curriculum is, at present, defined, curriculum organisation and methods of delivering the curriculum are the responsibility of the teacher. A resource which offers variety of approach is likely to appeal to a wider range of teachers.

Children are required to experience a range of learning opportunities, including investigation, observation, discussion and practical activities. The methods employed by teachers will also be dependent upon the subject or aspect of a topic that is being taught. The requirements of the curriculum in English will entail a different approach to those required in science, technology, maths or geography. Any resource designed for use within the curriculum will need to take account of this. Road safety education objectives can be met by integration into subjects and topics. However, it is also important that the road safety objectives are explicit and not 'lost' by teachers.

2.6.4 How teachers perceive road safety

Road safety education resources will help to shape the view that teachers have of road safety. The image of road safety that teachers and other adults have will depend upon their own experiences. Teachers may view road safety from their own encounters, which may have included clowns, puppets, lectures, codes and horror stories.

In the Department of Transport's Road Safety Education Good Practice Project (Department of Transport, 1995), effort was directed to changing teachers' perceptions of road safety. Following in-service training there was a considerable increase in teachers' understanding of the complexity of road accidents and the educational opportunities offered by road safety.

Balding (1988) carried out a national survey of parents, teachers and health care professionals. Over forty health topics were listed and respondents were asked to rank the importance of each. In the junior/middle school age range (approximately 8–12 years), safety in traffic was rated as one of the most important topics to be taught in the curriculum.

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Hollins (1990) carried out a study of student teachers' attitudes to road safety. She found that the majority feel it is important, but only a minority feel confident to teach it. The confidence of teachers may well increase if road safety is not perceived as a separate entity but as an issue which is part of their normal teaching. A resource which encourages this approach is likely to be considered as user-friendly.

Chapter 3 Listening to children

3.1 Introduction

As the project is child-based, it began with the belief that an educational programme cannot ignore the child at the centre of that programme. The first task was to listen to children to hear what they thought and how they felt about their road environment.

In developing the format for the discussions there was concern to find techniques which would provide an insight to children's perceptions of their road environment. It was also important that the techniques would be unthreatening to the children, the teachers and the headteacher. In the current educational climate, where the word *test* is highly emotive, the methods employed should not seem to be testing what has been taught or learned. The purpose of the exploratory discussions was to gather ideas and information on the 'workability' of the approaches in schools. Also important was the need for children to respond freely and as far as possible without inhibitions. This would mean that their communication skills should not be confined.

The main considerations included:

- the advantages and disadvantages of group and individual discussions;
- the structure and timing the discussions should take;
- the feedback likely from both open and closed approaches;
- the stimuli used to encourage responses from children;
- methods of recording the responses.

One of the main concerns at this stage was the problem of leading children to give answers which they thought were required. This was important as the children should not be made to feel that they were being tested, or that right answers were expected. Unfortunately, the traditional approach to road safety education has been more concerned with definitive answers rather than exploring a range of possible options which are dependent upon the circumstances.

3.2 The exploratory discussions

With older children questionnaire type surveys can provide valuable information, but there is a problem with finding approaches that suit younger children. There may be reading difficulties for children trying to respond to written techniques, which in itself would cause uncertainty and frustration. The stage of listening to children was not going to be a large scale survey, and an open ended approach which involved a researcher and a small number of children was possible.

The *Draw and Write* technique used by the Health Education Authority was considered a proven approach that could be employed. The study conducted by Williams *et al.* (1989) used the *Draw and Write* approach with 5–7 year olds and 4–9 year olds. It was developed in response to problems in finding language which suits the majority of young children, particularly as health education can be concerned with more abstract concepts.

This *Draw and Write* approach involves giving spoken instructions to children and reminding them that there are no right or wrong answers. The children are invited to draw and write, with assistance if necessary, in response to structured questions. For the purposes of the present study, a street sounds tape was used as an aural stimulus for the technique. Traffic sound tapes have been produced in the past for children to identify sounds. Children were encouraged to develop their listening skills through the recognition of the noises on the tape. The tape was not used for this purpose in the discussions, but chosen to enable each child to picture road situations with which they are familiar. A tape of street noises was produced which included general street and road situations and specific sounds such as bicycle bells and pelican crossings. The tape was approximately one and half minutes long. Discussion followed the drawing activity.

Rather than rely on one, albeit proven method, others were also considered. The development of an alternative open method to the *Draw and Write* approach was judged necessary at the exploratory stage. Consideration was given to practical approaches which included taking children outside. However, only the road environment immediately outside the school could be used which would have been limited in scope. As an alternative, photographs of a range of road environments were used as a visual stimulus.

Bearing in mind that 8–11 year olds would be participating in this project, a questionnaire was considered appropriate as a closed technique. It was designed to be completed by each child individually. It concentrated on three areas, 'where I feel safe', 'what grown-ups say to me' and 'what grown-ups do'. Again, the emphasis was not upon the children's knowledge of the road environment, but upon their opinion of what they see happening around them.

Of the four schools used for developing the discussion techniques, one was situated in an area with a predominant Asian population. The other three, although all in Essex, had very different catchment areas. Mildmay School is situated in an owner-occupied residential estate; Lawford Mead is at the centre of a council housing estate; Margaretting is in a rural village and only has 70 pupils. Both individual and group discussions were conducted with pupils of mixed ability and gender; the mix was left to the schools.

Table 3.1
Schools used for the exploratory discussions

School	Authority
Edgwick School	Coventry
Mildmay County Junior School	Essex
Lawford Mead County Junior School	Essex
Margaretting Primary School	Essex

3.2.1 Conclusions of the exploratory discussions

On average each group discussion took between 50 minutes and 75 minutes. The individual discussions took approximately 30–40 minutes each. The disruption to the school was minimal as only a few children at a time were removed from their normal classroom work. The discussions were conducted in the staff room, an empty classroom, the school hall or the cloakroom. There did not seem to be any great advantage in individual discussions. The group response seemed to be livelier and perhaps less threatening to children. These approaches can be quite tiring and any returns which may have been gained by individual discussions were likely to be diminished by the time several had taken place. The order of activity was changed to see if this made any significant difference to how the children responded. It did not appear to affect the conduct of the discussions. For some of the group discussions, an observer's checklist was completed by the local road safety officer.

The *street sounds* tape proved to be highly motivating for the children. Using personal cassette players with headphones meant that their involvement was individual and special. However, there was some initial confusion about the drawing task. In the first discussions, some of the children thought that they were required to draw each of the individual sounds they identified. In the later discussions, the researcher specifically stated that they were not expected to identify sounds, but to use them to imagine a picture of a road scene familiar to them.

Although drawing their 'sound pictures' was acceptable to most of the children, some older pupils were more inhibited about this task. There was a hesitancy about being the first person to put pencil to paper and one 11 year old girl asked if she could write or talk about what she heard rather than draw. For this child, the researcher wrote as she spoke. In the

first set of discussions, a range of drawing materials was made available for the children to use. Although great fun for the children, more time seemed to be spent colouring the picture rather than drawing their ideas. In the later discussions only pencils and one rubber was made available. The researcher also asked the children to write on their picture what was happening, for example, where they were going, who they were with and whether they felt safe or unsafe in their picture. It was also emphasised to the children that their ideas were more important than their drawing accuracy. The children could have been asked to draw a picture of a familiar road scene without listening to the tape. But it was felt that this might be a less interesting start, although, it was not tested to see if there was any difference in the response. Listening to the tape, especially when used as the first activity helped to put the children at ease, because it was fun, and involved them immediately.

Every child appeared to enjoy completing the *questionnaire.* The questions were read out to the younger children, but not to the older pupils. However, each section was explained carefully. Pupils were also asked to add other comments that grown-ups say to them. The comments that were added were not necessarily related to road safety, for example, "Be well mannered". This comment was written by an eleven year old Asian boy. "Don't go with strangers", was also added by several pupils. Apart from asking the children to make additional comments this activity was limited to completion of the questions. Discussions about situations did not take place. No children stated that they had difficulty completing the questionnaire.

The response to the *photographs* was very good. At the first school, the children were simply asked to make comments about the photographs. This very open approach led some to spot the hazards and others to make no comments at all. As the interviews developed, a more defined structure emerged. Pupils were asked to say, first, whether they would feel safe or unsafe in the photograph and the reasons why. They were then asked to say how they would make themselves safer in the situations defined as unsafe. The children's comments were recorded on *Post-It* notes. The instructions for the researchers conducting the exploratory discussions are given in Appendix A.

3.2.2 Focus for listening to children

The techniques were tried out in four schools with 48 children to gather ideas and information on the viability of the approaches in schools. That is, they were regarded as essentially heuristic. The concern was finding out what children think and feel about their road environment and the safety messages given to them.

Following the piloting of the discussion techniques, the following structure was developed as the focus for listening to children.

1   What makes children of different ages feel safe or unsafe in the road environment.

2   What they think would make them safer.

3   How much children of different ages feel that it is their responsibility and what control they have for keeping themselves safe.

**3.3
Listening to
children –
the group
discussions**

The exploratory discussions had produced some interesting and useful responses from the children. On that basis they were successful, and also in terms of acceptability to the school. It was felt that the main discussions should maintain a semi-structured approach so that the children felt at ease and would respond freely. Three activities were used, a *questionnaire, photographs* and a *map activity* which replaced the *street sounds tape.*

On reflection, it was felt that the street sounds tape was time consuming in relation to the information gained. When reviewing the children's drawings, it was found that a drawing would tend to concentrate on a specific event or a specific place. It may be that to gain a greater insight to children's accidents and how they think they happened, this technique is excellent.

If the *street sounds tape* was not to be used as a starting activity, another had to be developed which would not make children feel threatened or that they were being tested. Also, the information should provide us with an understanding about how safe children felt in their local environment. It was decided to use a local map, with the school as a focal point. Children could immediately identify with the school and could talk about their journey to school. This activity provided the children with a specific task which was also related to their own personal experiences. Map activities have been successfully used in the past, albeit with older children (Clayton *et al.,* 1991).

The *questionnaire* was retained with some modification. Two new questions were added about specific circumstances in which children used the road, such as with friends and on the way to school. The third section of the questionnaire, 'Grown-ups do this', retained all the original statements. One addition was made which asked children to say whether grown-ups, *Drive faster than the speed limit.* An open response was available to the children who wished to comment on what else grown-ups did. Also, the children were asked to complete one table stating how they came to school and another asking how they thought they would travel to secondary school. This was followed by an open question about where they go without an adult.

The third approach using *photographs* as a visual stimulus became a more structured discussion. The photographs, which included situations without children, children as road users without adults, children with adults, pedestrian situations, cyclists, rural and urban contexts, roads and schools, and roads and shops, were of several locations in England.

3.3.1   Conducting the discussions

Discussions were held in groups of four with a total of 128 children aged 7–11 years. On average each group discussion took 45 minutes. They began with the *map activity*, followed by the *questionnaire* and then the response to the *photographs.*

Table 3.2
Schools used for listening to children – the group discussions

School	Authority
Deansbrook Junior School	Barnet
Bankfields Primary School	Cleveland
John Shelton Junior School	Coventry
Bennetts Well School	Solihull
Llanidloes Primary School	Powys
Alumwell School	Walsall
Potterne School	Wiltshire
St Martin's C.E. Junior School	Wiltshire

3.3.2   The response to the maps

The maps featured the school and the surrounding area. The children were asked to find the school (which had been coloured in) and then draw on their route to school. Next, they were asked to mark any places they regarded as unsafe and explain why. Following the group discussions, the data obtained from the map exercise was reviewed. In general, children described roads as safe or unsafe because of the amount of traffic. A road perceived as busy was also perceived as unsafe. Comments were rarely any more specific than "Because it is a busy road". In some cases a road was regarded as unsafe because of an incident that had been seen, or an accident that had nearly happened. The incident was not always specific to a traffic situation. For example, a place was unsafe because a 'drunk' was sometimes on the corner. Comments about the behaviour of road users were generally concerned with drivers and speed. Few commented on the danger of parked cars, or dangers due to heedless crossing of the road by pedestrians.

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The main purpose of the *map activity* was as an introduction to the group discussions. An analysis of the accident data, including the distribution of accident locations was attempted, to determine the extent to which children's perceptions of dangerous sites and situations are mirrored in actual road accident patterns. Accident and casualty details of 8–11 year olds were obtained for a rural and urban location, but it is not possible to tell for sure which school a child attends as the police records do not always include this.

The difficulty of trying to match actual accidents and children's perceptions of dangerous situations is that, one is based upon specific criteria devised by adults and the other is based on an 'of the moment reaction' by children. Data were not obtained from the other authorities because it was felt that a matching exercise would not provide any additional information. The children may perceive a road as dangerous, although there may not have been any accidents at the site.

3.3.3 The response to the questionnaire

The *questionnaire* was devised for the children to complete individually. The statements were read out to the children thereby overcoming any reading difficulties that might exist. The children were also asked to complete a table stating how they came to school and another asking how they thought they would travel to secondary school. This was followed by an open question about where they go without an adult. The first section related to 'Where I feel safe'. There was general agreement that children feel safe on quiet country roads, when they are with friends, and on their way to school. They also believe that they know where to find a safe place to cross the road. The second section related to 'What grown-ups say to me'. Adults give children three main messages: 'Stop at the kerb', 'Listen for traffic' and 'Wear your seat belt'. They do not, in general, ask them if they can tell how fast the cars are going. The third section related to what grown-ups do. There was general agreement that grown-ups 'Hold my hand when I'm walking with them' and 'Explain where it is safe to cross the road'. Around half the children said that grown-ups cross the road at a pelican crossing when the red man is showing and cross to the middle of the road and wait for traffic to go past before crossing to the other side.

Most children responded to the additional open question about where they felt safe. In all 88 comments were made. A common response was at home, at school or with parents. There were also the interesting responses. The village school in Wiltshire produced some comments which were specific to the location. Safe places that were mentioned included, the stream, the pump and the deer farm.

In Llanidloes the children were asked to say where they felt unsafe, rather than safe. Unsafe places included, where there was no pavement, on my bike by the roundabout and on my bike on a busy road.

In response to the open question on 'What grown-ups say to me' there were 86 comments made. Children are told several do's and don'ts by adults. Many comments related to the road were concerned with stopping, looking and listening, not running and crossing at safe places. Don't go with strangers was stated by children at the school in Salisbury six times. This probably reflects the fact that the school had recently run a Junior Citizen programme in which *Stranger Danger* was strongly featured. The word don't was used frequently, but perhaps the most enigmatic comment was "Don't go anywhere you shouldn't".

When asked about what grown-ups did, the majority of the comments were concerned with unsafe adult behaviour. However, a few children did respond with positive statements, for example, "Hold my hand when we cross the road", and "They stop at red lights and wait until the people go past". Drinking and driving was the most common negative behaviour mentioned by the children. It was stated 10 times in 49 comments.

The most common activities in which children took part without adults included playing out, going to the shops, and 'on my bike'. Out of the total of 86 comments, only four said

that they did not go out without an adult. Three of those comments were made by 7–8 year old pupils at the Salisbury school.

No discussion of the issues raised took place. However, more than one teacher commented that each of the questions would make a suitable topic for discussion. No children stated that they had difficulty completing the questionnaire.

3.3.4 The response to the photographs

The 12 photographs used were deliberately designed not to represent a particular part of Britain. They appeared to be successful in this respect – a sad reflection, perhaps, of the monotony of the modern British urban environment. In fact, many children seemed to think that the photograph represented places they knew locally, or had visited. There seemed to be a strong desire on the part of the children to identify with the situations they were shown.

The children could respond freely because they did not have to write their opinions themselves. Researchers wrote down the children's responses on *Post-It* notes. As far as possible the exact words were written down, but, if this was not possible, the comments were checked with the pupil who had said them. During the exploratory discussions a researcher merely summarised the children's responses. This technique lost the flavour of the responses and was not used again.

The response to the photographs was very good. The children were asked to say, firstly, whether they would feel safe or unsafe in the photograph and the reasons why. They were then asked to say how they would make themselves safer in the situations defined as unsafe. A one-star rating was Very Unsafe, two-star Unsafe, three-star In-between, four-star Safe and five-star Very Safe. In some cases, no member of a particular year group gave the photograph a one- or two-star rating. As a result, the photographs were not presented to the group again for their suggestions as to how they might make themselves safe in that particular situation.

After they had given the reasons for the rating, all the photographs that had been given three, four or five stars were collected in. The children were then asked how they could make themselves safer in the situations which had been rated unsafe and very unsafe. For each photograph, a coding frame was drawn up to classify the responses. The frame was divided into safe and unsafe and there were normally about a dozen items to each frame. A coding frame for the solutions was also devised.

Although there were equal numbers of children in each year group, the number of comments per year group varied. On occasion, one child might make a response that covered several items. It should also be remembered that these comments were made by members of a group. Sometimes, a child would merely repeat an earlier comment. On other occasions, a child would disagree totally with another member of the group. Some examples of the children's responses are discussed below.

The situation considered to be safe by all groups was that of a pedestrianised area in a city centre. This was largely because people were crossing at a pedestrian crossing whilst the 'green man' was showing. The presence of a lot of people and the total absence of cars also contributed to the feeling of safety, although a few children did not feel safe amongst crowds for fear of being mugged.

Another situation perceived as safe by most children was of a country road because of the total absence of traffic, although the children aged 10–11 thought that there might be fast cars, a fact reinforced by the perceived absence of a speed limit.

The situation perceived as least safe by all age groups was of a school entrance in a street of Victorian terraced housing. This situation was judged to be unsafe because cars were approaching as a man and child were crossing the road together. The presence of parked

cars and the fact that one car was pulling out were also seen as dangers. The major safe element was that the pedestrians were looking. A pelican or zebra crossing was regarded as the safe solution, plus crossing where there were no parked cars.

Another site where the unsafe elements outnumbered the safe elements, for all age groups, was a traffic calming zone. It is likely that this photograph was the most unfamiliar of all the photographs shown to the children and there was a wide variety of comments. Many were concerned with what might or could happen, especially that cars could come from round the corner. There was also concern expressed of a kidnap threat by three children.

The threat of danger from strangers was also expressed by some children about the situation showing a parked ice-cream van. The safe elements included the fact that children were on the pavement and the road appeared to be quiet. Previous research studies have shown that safety in the road environment is not only concerned with traffic. Children in the present study, although aware that the project was about road safety, also indicated other areas of concern.

There was considerable agreement by the children aged 7–10 years old that it was safe to cross at a busy crossroads because there were traffic lights present. Some concern was expressed that it was a busy road with a car coming although the 7–8 year olds, in particular, thought that the red car in the picture had stopped to let the pedestrians cross. The 10–11 year olds, however, were more likely to regard the situation as unsafe because they noticed that the men were crossing while the 'red man' was showing.

In response to how they would make themselves safer, the children had a preference for installing traffic lights, pelican crossings and zebra crossings. They are obviously the traffic engineers of the future! The safe solutions were not always suggested by the person who had described the situation as unsafe.

The analysis of the star safety ratings assigned to the photographs suggested a tendency for the children aged 7–8 years to be more likely to perceive a situation as safe than other children. Many children appeared not to accept direct responsibility for their own safety in that their first suggestion on making the situation safer was to improve the road environment. Only when prompted did some of them consider their own behaviour.

3.4 Conclusions and focus of the resource

Listening to children is a salutary experience. The discussions were designed to provide an opportunity for children to talk. If these are the responses to situations which are presented in safe and unpressured conditions, one wonders what the children are thinking when they are using the roads.

The comments on unsafe situations are often general rather than specific. The children, even when they had been told that the discussions were about road safety, responded to the road environment and not just the traffic environment. The number of unprompted comments about 'stranger danger' was quite surprising. It seems, also, that the concept of finding a safe place to cross really means find a zebra or a pelican crossing.

The road environment is neither totally unsafe or totally risk free, but children need to know why some places are more risky than others and the specific strategies that they can adopt, and with which they feel comfortable.

Engineering measures alter the road environment and are designed to modify the behaviour of the road user. It seems that changes to the roads through engineering are outstripping the road safety education being provided to children. Where engineering schemes are being implemented, local schools are often involved. However, one wonders how the children who have not had the benefit of working on such a project are expected to understand the engineering measures.

Road safety education for young children is often concerned with the understanding of the features of the traffic environment. The road and the pavement were regarded as two

distinct places, with the kerb as the barrier. Engineering measures which, in places, result in the kerb and the road merging, render the message of stopping at the kerb as inadequate. In this situation it is important that children gain an appreciation and understanding of how different traffic environments operate.

A meeting of the advisory group took place prior to the development of the resource. The results of listening to the children were provided and discussions as to the focus and possible format of the resource took place.

The resource aimed to focus on the following:

1   the relative risks of the road environment and how to minimise risk in the traffic environment;
2   ways of taking personal responsibility for keeping safe as a pedestrian, cyclist and passenger;
3   the traffic environment of the future.

The approaches used to listen to children did more than provide an insight into how children viewed the road environment. It became apparent that the techniques were positively received by children, in particular, discussion of the photographs. Issues were discussed and debated by the children and they were able to learn from one another.

The success of the techniques used to listen to children became a major influence in the development of the resource and the evaluative measures. The photographs used in the evaluative measures are shown in Chapter 6 and Appendix C.

Chapter 4 Development of the resource

4.1
Introduction

The discussions with children were an essential element of the project. They provided an insight as to how children of different ages respond to a range of situations. Although only four years difference, the age band is wide in terms of physical growth and social and emotional development.

The road environment does not remain static. Changes in the built environment take place continually. Trends in engineering measures affect the world in which children travel and play. By the time children reach the age of 11–12 years old and most are transferring to secondary school, they will need to do more than repeat road safety rules. They will need to be able to adapt to environmental changes by transferring their knowledge of keeping safe to a range of circumstances.

4.2
Training or education

Road safety training is an approach used for both pedestrians and cyclists. If pedestrian training takes place at all it is most likely to be aimed at children aged 5–7 years. For example, Oxfordshire County Council (undated) have developed their *Footsteps* programme for the very young pedestrian. Cyclist training, on the other hand, is most likely to occur when children are 11–12 years old. National and locally devised cyclist training programmes have been long established but there remains a question mark over their efficacy.

Thomson (1991) has proposed that programmes based on pedestrian roadside training or using realistic simulations have led to improvements in visual timing and gap selection and identifying safe places to cross. The resource *Let's Decide – Walkwise* (Royal Society for the Prevention of Accidents, 1993) was based upon training, leading to marked improvements in the judgement of children as young as five years old.

It would seem obvious that a practical skill of using the roads should involve children learning in real situations, especially at a young age when their experience is limited. Skills training, however, does demand numerous roadside visits which can be very labour intensive. With the current curriculum and management demands being made upon schools it is unlikely that schools would wish to undertake a time consuming activity which is not directly related to the needs of the curriculum.

The children in the present project are 8–11 years old and will have gained experience of using the road, either when supervised, or increasingly as they get older, unaccompanied by adults. Studies which showed that most children involved in road traffic accidents knew the road well have been noted previously in Chapter 2. The problem may not, therefore, be one of children not having the skills, but of applying the approriate responses at all times.

As children get older they will experience a wider range of road situations with which they may be unfamiliar. Williams *et al.* (1989) in their study of children's perceptions of keeping safe noted the difference between the responses of children of 8–9 and children aged 10–11. Eight year olds still think it is the responsibility of adults to keep them safe, but nine year olds are beginning to see that they have some responsibility, with adult help. The 8–9 year olds are also beginning to think ahead and check things and know more about potentially dangerous situations. The key messages that came from the 10–11 year olds were that they have good ideas about how to avoid or deal with situations, but not much practice. While ten year olds still think it is someone else's responsibility to keep them safe the eleven year olds are beginning to accept some personal responsibility.

The 8–11 year olds do not necessarily lack the specific skills, but they are beginning to understand that there is an interaction between their perspective, those of other people and the circumstances of the situation. The responses to the photographs indicated that they could see potential dangers. It was also apparent from the older children that adults were

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not exemplary role models. The 10–11 year olds, in particular, recognised the conflict between what they were told to do to keep safe on the roads, and the observations they made of adult behaviour. They realised that children and adults cross the road using different techniques.

It was not intended to base the resource around a specific training programme as the basic skills and the knowledge may be known by children. However, a need for reinforcement of these skills and an understanding of why certain behaviour and strategies are appropriate in some situations was seen. The major difficulty lay in keeping a balance between providing specific information that would be of assistance to children, and presenting situations which encouraged observation and decision-making skills.

The secondary objectives suggested by Rothengatter (1981a) would seem particularly relevant to the 8–11 year old child. Reaching these objectives involves taking a holistic approach which not only reinforces relevant skills but also takes into account that the child is an individual in a social setting.

Knowledge and experience of the road environment is an important aspect of learning. Activities were devised which encourage this and will enhance, rather than compete with, training programmes in which schools and children may take part. An important consideration was to make the resource accessible to all schools, no matter what the location or the social and cultural intake. An imposed standardised programme would not be suitable for every school, teacher or child, but an educational programme which forms part of the normal curriculum organised by a school is most likely to include all children. It also acknowledges that schools and their communities have disparate needs and priorities and that the children will bring experiences of their own neighbourhood with them to school.

4.2.1   Key points considered in developing the resource for 8–11 year olds

Which type of road users? – In the target age group, children are primarily at risk as pedestrians but are also cyclists and vehicle passengers. It was decided not to base the resource on one type of road user, but to include a variety of road user situations.

Relative risks – the dangers that children perceive in the road environment are not necessarily those from which they are at greatest risk. This does not mean that their fears are inconsequential, but that their perspective of dangers in the road environment is affected by issues other than road safety, for example, fear of strangers.

Knowing the skills – both the skills they use and those used by other road users.

Personal responsibility – encouraging an active rather than a passive role in keeping safe.

Strategies not rules – the need for being able to adapt to changing situations, for example, the same road at different times of day and the different road environments that exist.

Identification of hazards – as they exist at a particular moment but also encouraging children to take a 'What if ...' view.

4.3 Presentation and structure of the resource

The approach adopted for the resource was based upon the initial work of listening to children at the start of the project. It is realistic – real situations are presented and tasks are activity based, challenging children to think seriously about appropriate strategies to adopt when using the roads.

The resource consists of five elements (Tables 4.1 and 4.2 and Plate I):

  1) The big book
  2) Linked stimulus sheets
  3) Interactive poster
  4) Street sounds cassette tape.
  5) Notes for teachers

Plate I
The resource

4.3.1 Big Book

The *Big Book* is approximately 600mm x 400mm and printed on thick card with colourful graphics, including 10 x 8" photographs. The text includes information and questions to think about and use as a basis for decision making discussions. There are six double pages plus the front and back covers which have been used for an illustrated glossary. It was designed to be used as a resource book to which both pupils and teachers can refer. The book could be made available in the classroom and/or the school library. It could also be used as part of a display. The big book is very visual, but unlike a video does not rely on the teacher to show it.

4.3.2 Stimulus sheets

There are 24 *Stimulus Sheets* which form part of the *Notes for Teachers* and relate to the double pages in the *Big Book*. Each can be integrated into a subject or topic and support the on-going classroom activities planned by the teacher. They are not intended to be handed out to the children, although if pupils are capable of using the sheets themselves they can be photocopied and distributed.

4.3.3 Interactive poster

The *Interactive Poster* is a changing display of photographs (Table 4.2). Teachers can use the pictures that they feel are best for their class. With the photographs are a set of cards to stimulate discussion. The *Notes for Teachers* also contain specific questions for the children to answer.

4.3.4 Street sounds tape

The *Street Sounds Tape* includes a series of sounds which children are asked to listen to and then draw the picture they saw in their mind as they were listening to the tape (Table 4.2). Their drawing then forms the basis for discussion work.

4.3.5 Notes for teachers

The *Notes for Teachers* are comprehensive, providing background information to the project and child road accident information. For each element of the resource suggested teaching approaches are given plus discussion questions and suggestions for follow-up activities. Relevant curriculum areas are also stated. The notes contained evaluation sheets for each aspect of the resource.

In addition a copy of *The Highway Code* and *A Highway Code for Young Road Users* was included in the pack.

**Table 4.1
Contents of the big book**

The big book	Stimulus sheets
Double page 1 – Growing changes This focuses upon changes in the child's lifestyle as they get older. The photographs and questions that are asked are about where children play and the transfer to secondary school.	1 Growing changes 2 Places to Play 3 With friends 4 Limits and Boundaries 5 Time Travellers 6 Going back
Double page 2 – What is a Road? This includes photographs of different types of road. The problems and safety aspects can be discussed and the speed of the traffic.	7 Journeys 8 Roads and Traffic 9 Places to Live 10 Making a Traffic and Weather Report 11 Congestion 12 Sharing Space
Double page 3 – Two Feet Photographs of difficult situations are shown and questions are asked as to whether the strategies the pedestrians are using are appropriate. The problems crossing between parked cars and near bends are explained.	13 Observation Patrol 14 Judging Time 15 Safety Senses
Double page 4 – Where to cross A section which looks at crossing places and how they should be used. It also includes a street plan and questions concerning the best route to take.	16 Where to Cross 17 What Shall we Tell the Children 18 Problem Page
Double page 5 – Two Wheels The road environment seen from the perspective of the cyclist.	19 Route Planning 20 Maintenance Checklist 21 City of the Future
Double page 6 – Four Wheels The road environment seen from the perspective of the driver and passenger.	22 My Ideal Driver 23 Now You See Me, Now You Don't 24 Future Drivers

**Table 4.2
The interactive poster and street sounds tape**

The interactive poster	Cue cards – safe and dangerous
1 Crossroads	How I would feel
2 Light controlled junction	I would fee safe because... I would not feel safe because... I would make myself safer by...
3 Hill	
4 Rural Road	Hazard spotting
5 Housing estate with garages	Are there any hazards in the photographs?
6 Traffic calming	Is there anything in the photgraph
7 Terraced housing with parked cars	which makes using the roads safer?
8 Pedestrianised area	What happens next?
9 Cyclists on the pavement	What do you think could happen?
10 Narrow road and pavement in snowy conditions	What would you do?

The street sounds tape	Use
A series of traffic sounds and people, lasting about one and a half minutes	As a stimulus for draw and write activities

4.4
The pilot study

Four schools were used to test the resource, involving ten teachers and two hundred and ninety six children. Two of the schools were in the urban West Midlands and two were in Wiltshire. One of the schools in Wiltshire was a small village school, the other was in Salisbury.

4.4.1 Teacher briefings

The time available to talk to the teachers in each school varied. In the two West Midlands schools up to one hour at the end of the school day was arranged. In the rural village school the resource was discussed while the pilot pre-tests were conducted. This was possible because of assistance by the RSO and because class sizes were small. At Salisbury the researchers met with teachers at the beginning of the school day for approximately 15 minutes.

The initial reception from the staff depended upon how well the headteacher or contact teacher had communicated with all those involved. At each of the teacher briefings, it was difficult to explain fully the background to the resource because of the lack of time. Emphasis was placed on highlighting the different elements of the package and the importance that we placed upon their evaluation of the resource.

For this pilot stage, the teachers were given very little guidance on how to teach and what approaches they should use with the different year groups. Although this was deliberate, it did mean that it was not clear what to expect from each of the schools. There had been plans to observe the teaching, but it was considered inappropriate to observe classroom activities following these initial meetings. In a primary school visitors cannot be unobtrusive. The children are keen to involve everyone in what they are doing. Conducting the pilot pre-tests had already given the researchers a prominent role and it would have been very difficult to sit quietly at the back of the class. In addition, the teachers were being asked to take on extra work and it was in the best interests of the project not to increase their anxiety.

4.4.2 The teachers' response

The resource had been left with the schools for one month. Primary schools usually plan their curriculum and projects at least one term in advance and in many cases it is planned for the next academic year. The resource is extensive and has been designed to cover four years of primary education. The teachers had been asked to use the materials in a very short space of time and it was a concern that we may not get the coverage or sufficient feedback.

The debriefing meetings were informal and the researcher's role was that of facilitator. An hour at the end of the school day was set aside for the debriefings in three of the schools, and 30 minutes before school began in the fourth. The overall response to the package was very positive. The amount of work achieved by the teachers and children in such a short space of time was impressive. It was also recognised by several of the staff that the situation was unrealistic and that in the normal course of events there would be much greater planning and liaison with teachers from each year group.

The response to the teaching activities varied both with the school and the individual teachers. In one school, two teachers of 7–8 year olds considered the sounds tape activity to be excellent, but were unimpressed by the stimulus sheets. However, the two teachers of 8–9 year olds were quite enthusiastic about the activities on the sheets. In another school a teacher of 7–8 year olds thought that given more time she could use the ideas in the stimulus sheets as she considered them to be excellent.

It became obvious that the perception each teacher had of road safety influenced what they considered to be appropriate for their class. At one school where three teachers of 10–11

year olds had collaborated they thought their children needed 'nitty gritty' road safety. Consequently, they were particularly impressed by the sheet concerned with cycle maintenance. They also thought the *Ideal Driver* sheet very relevant. The children at this school were described as street wise.

It was encouraging to hear that teachers had adapted ideas and organised activities to suit their children. At one school they were almost apologetic for not following the teachers' notes exactly. They had included a road safety video to supplement their work and thought that this may be perceived as a criticism of the pack. In fact it was considered to be a positive action. One resource cannot hope to meet all needs.

The main criticism of the *Big Book* was the large amount of text and the language that had been used, but the idea was highly rated. One teacher commented that it was very popular with parents when on display at a parents' evening.

All the teachers who had used the photographs were very complimentary about this element of the pack. The pictures were considered to be relevant and showed a range of road environments. Only one teacher expressed doubts as she thought that we could include more pictures which showed people.

The written evaluations provided comprehensive feedback on the resource. The constructive criticism indicated where improvements could be made and ideas developed. At the beginning of the pilot stage, it was unclear how much of the resource would be trialled by teachers, especially given the current pressures on schools. The coverage of all the activities was very good and the hard work of the teachers was very much appreciated. It was piloted in four schools in three different local authorities and the overall response to the package was very positive. It would have been unsuitable to prescribe a specific manner of teaching and the pilot version of the resource was written offering a variety of approaches in order to appeal to a wider range of teachers. In addition, the ideas offered by the teachers were appreciated. Teachers who used the resource appreciated the flexibility of the format and presentation of the package which allowed them to dip into and use the most appropriate elements of the package for their class.

4.4.3 The main study resource

The written and verbal comments made by the teachers at the pilot stage were invaluable in developing the resource for use in the main study. The structure and elements of the resource were very acceptable to teachers but improvements were made, in particular to the *Big Book*, to reflect the teachers' recommendations.

Chapter 5   Development of the evaluation measures

5.1 Current trends in evaluating education

In general, there are two major approaches to the evaluation of educational innovations. The first technique, termed the *scientistic ideal* (Cronbach, 1982), is derived from experimental psychology. It concentrates solely on the objective, quantitative data collected on the 'performance' of the subjects before and after they undergo an experimental 'treatment'. Using this technique, the efficacy of a particular educational initiative may be judged against another initiative or against no initiative (using a control group). This approach tends to involve the use of large samples and rigorous statistical design and analysis.

The second approach known variously as the *humanistic ideal* (Cronbach, 1982) or *illuminative evaluation* (Hamilton *et al.*, 1978) places more emphasis upon the description of the methodology and the interpretation of the results, rather than purely considering the measurement of performance of the subjects. It has also been termed the *anthropological approach* (Parlett 1969). Its aims are to study the innovatory programme, how it operates, how it is influenced by the various school situations in which it is applied, what those directly concerned regard as its advantages and disadvantages, and how the students' intellectual tasks and academic experiences are most affected. In short, it aims to discover what it is like to take part in the programme, either as a teacher or pupil and to identify those parts or procedures of the programmes that appear to have desirable effects (Parlett and Hamilton, 1972).

Unfortunately, within evaluation research, the proponents of the two approaches have tended to adopt very one-sided views and promote one approach to the exclusion of the other. Yet both approaches have their own merits. The humanistic approach, for example, would seem to be of particular benefit during the piloting of a educational initiative where the influence of external factors needs careful consideration so that appropriate controls may be built into the final experimental design. Its emphasis upon the key role of teachers in influencing the level of success of an initiative must not be ignored. Yet, for the main study, a rigorous evaluation is required to enable others to judge effectively the efficacy of the programme.

5.2 A review of evaluative techniques

A variety of techniques have been used to evaluate the effectiveness of educational and training road safety programmes. Some of the more recent studies are examined in this next section in the context of their value to the present study.

5.2.1   The table-top model and roadside training

The research by Thomson and his colleagues in Scotland (Thomson *et al.*, 1992) suggested that five year olds' judgement as to safe places to cross a road could be improved by training either at the roadside or by using a table-top model in the classroom.

Their work led to the development by the Transport Research Laboratory of a resource entitled *Let's Decide – Walkwise* since evaluated by Tucker (1993). Evaluation was undertaken using a table-top model. Children aged five to eight were asked to take a model figure between five locations on the model road network in response to a story. Routes were classified as *safe, safe but long,* and *unsafe.* Significant improvements were obtained between pre-test and post-test for children in schools which were judged to have followed the resource closely. Children in the less compliant schools did not show the same kind of improvement in their understanding of safe crossing behaviour and route selection. No information was given on the time span between the end of the training programme and the post-test and no second post-test evaluation was undertaken to determine if the improvements were maintained over time.

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Such techniques are viable with individual members of a small group. However, the time taken to use the same technique with a typical primary class of 30 pupils would be more than could reasonably be expected from the schools to be used in the present study. Tucker only used half the children in each class. One must also question the transferability of such skills to the real world under unsupervised, that is natural, conditions.

5.2.2 Videotaping of actual road crossing behaviour

This technique was used with very limited success in previous research (Clayton *et al.,* 1991). As many primary school children are escorted to and from school by adults (an analysis of the travel patterns of the children in the initial discussions revealed that over half were escorted by adults, on foot or by car, or by older siblings). It would be very difficult, therefore, to film a large proportion of this target group in the vicinity of the school or during the journey to or from school. Filming their crossing behaviour at other times (eg when playing with friends, at weekends or during holidays) presents other major difficulties, including the time required to obtain a large sample of crossing movements.

5.2.3 Actual observation of children

This technique has all the drawbacks of videotaping. In addition, the presence of a 'strange person' (particularly if male) watching children in the vicinity of a school is soon noted and reported, either to the school or to the police.

In his study, Rivara (1991) persuaded the experimental children to wear highly visible labels on their outer clothing and stationing unobtrusive observers near the exits to the schools. However, even if the technique was successful in that the children were unaware of the observers' presence, the presence of adults escorting children would severely limit the opportunities for unsupervised crossing behaviour to be observed.

5.2.4 Hazard perception techniques

McKenna (1992) has been developing techniques for training novice drivers to be more proficient in the detection of hazards. His method is to show video film shot from a driver's eye view. His results tend to indicate that such training can work.

In the discussions with children (see Chapter 3), colour photographs of street scenes were used as catalysts for discussion about safe and unsafe features of an environment. The results suggested that children can cope with the task of identifying the safe and unsafe features of a particular scene from a photograph. However, many of them have a wider view of road safety which includes threats to personal safety from strangers as well as from traffic. In addition, they have a bipolar view about the presence of adults. Some regard a group of adults as providing security whilst others see the group as offering a threat. Single adult males, if detected in the photographs, are almost always regarded as a threat.

5.2.5 Traffic trails

McGregor (undated) used traffic trails in Glasgow as a method of teaching safe pedestrian behaviour in a realistic but supervised traffic environment. With a ratio of trainer to pupils of no greater than 1:5, it is a labour-intensive and time-consuming technique which could not, for practical reasons, be applied to the whole of the sample in the present study. However, as a method of testing behaviour, albeit in a slightly artificial situation, it clearly has some potential.

5.2.6 Knowledge and attitude tests

Such tests have the great advantage that they can easily be administered to a class group. If designed correctly, the influence of writing and language skills may be minimised, eg by the use of pictures and multiple-choice answers. Children in the target age group are becoming used to such test procedures.

Development of the evaluation measures

Knowledge tests, when used to assess road safety education programmes, are always open to the criticism that children may acquire the relevant knowledge but do not necessarily put it into practice in everyday situations. Whilst accepting, at least partly, the validity of such criticism, it must also be emphasised that, without the correct knowledge as to how to act in a particular situation, children are in an even worse situation and have to rely on luck, instinct or other factors! All of the techniques so far described (other than Rivara's (1991) study) have tested children in an artificial situation and thus the problem of transference to real-life situations is common to all of them.

Attitude scales can be considered as affecting the probability that knowledge will be put into practice in the real situation. Experience gained from the initial discussions with children suggested that they could generally cope with making judgements on simple attitude statements, although the differentiation between 'don't know' and 'can't tell' proved difficult.

Both competency-based assessment and knowledge tests suffer from the disadvantage that subjects can score highly simply by knowing the correct method, ie learning by rote. A more important skill may be to adapt behaviour to the conditions. Few, if any road users, whether child or adult, ever use the principles of the *Green Cross Code* precisely every time they cross the road. Skilful adults demonstrate their skill by their ability to adapt behaviour to the situation; taking more care in the dangerous situations and knowing which 'rules' may safely be broken in less dangerous situations. For example, where there is a lot of traffic or a sight restriction or where vehicles travel at high speed, careful pedestrians tend to look and listen more frequently as they cross the road.

5.2.7 Semantic differential measures

In a study of children in Glasgow, under contract to Strathclyde Regional Council Roads Department, Davies (1994) used a semantic differential technique (Osgood *et al.*, 1957). The technique involves providing the subject with at least nine pairs of bipolar adjectives (eg good, bad), for each of which there is a seven-point scale. The subject has to mark some point on the scale for each pair of adjectives. Single words, rather than attitude statements, are used to denote the attitude object. From the results, Davies hoped to obtain perceptions of "the self" and "the ideal self" and compare these perceptions with the ratings of others who either adhere to or do not adhere to recommended road-crossing practices. He believed that the results may give indications as to children's motives, by comparing "the kind of person the child wishes to be" with the perceived characteristics of some notional, ideal group ie "children who cross the road properly".

In some areas of health education, there is evidence that the children who do not smoke or do not drink possess clear negative characteristics which tend to make them far from ideal role models. Rivara (1993) came across a similar phenomenon in his bicycle helmet campaign where he referred to it as the "nerd factor".

5.3 Piloting the evaluative measures

In essence, the present resource aims to provide children with the information they need to develop the skills required to cope safely with the traffic environment as pedestrians, cyclists or passengers. The evaluation techniques therefore concentrated on measuring whether that information has been absorbed and retained by the children and whether they have successfully developed the necessary skills. Establishing whether or not they actually adopt these skills in real life is outside the scope of this study.

The pilot evaluative measures consisted of:

1   Paper and pencil knowledge tests with as little text as possible;
2   A simple attitude scale;
3   Looking at photographs of traffic situations

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For Item three, separate, but similar, sets of photographs to those used in the resource were produced. Children were required to demonstrate their ability to analyse the photographs in the same terms as used in the teaching programme. The testing of the real-life use of skills using traffic trail techniques were unable to be developed because of the constraints on curriculum time. Five tests were used during the pilot stage. Modifications were made during this period as experience was gained. The knowledge tests became increasingly more visual. Asking questions about the photographs meant that there was less dependence on the language and writing skills of the children. An important factor in all the tests used was the willingness of the children to take part and their obvious enthusiasm.

Chapter 6   The main study –
1 Outline and pre-test results

6.1
Introduction

The aim of the main study was to evaluate the effect of teaching the resource upon children's knowledge and understanding of, and attitudes towards road safety issues. The intention was to assess both the immediate effect of the teaching and a more long-term effect. The study used a control group pre-test two post-test design.

6.1.1   The chosen schools

With the assistance of local authority road safety officers, schools for the main study were selected from seven areas of Britain: Glasgow, Sunderland, Walsall, Chelmsley Wood, Rhayader, Barnet and Warminster (Figure VI.1). In each case, the schools were chosen from amongst those with council estates as their predominant catchment area. In several instances, these catchment areas had serious levels of social deprivation.

Figure VI.1
Location of
schools used in
the main study
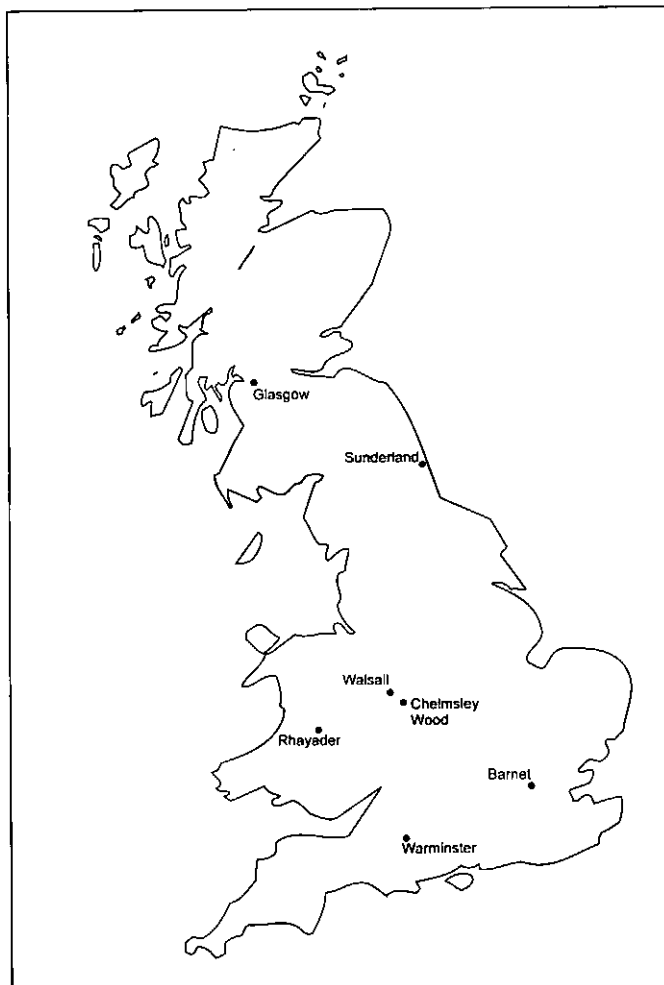
6.1.2   Timetable

It was necessary to complete the study in a period of six months and within the confines of the school terms. The timetable is shown in Table 6.1. The teaching of the resource was undertaken to the experimental group in the five to six week period between the pre-test and post-test 1. The second post-test was undertaken after a period of four months which included the school summer holidays. As far as possible, the schools were tested in the same order during each of the three tests.

Table 6.1
Timetable for Main Study

Date	Experimental Group	Control Group
9–27 May 1994	Pre-test	Pre-test
May – June 1994	TEACHING	
6 June – 15 July 1994	Post-test 1	Post-test 1
10 October – 8 November 1994	Post-test 2	Post-test 2

6.1.3   The tests

The tests undertaken by the children were designed for two main purposes:

1   To obtain a picture of their use of the roads, their thoughts about road safety and their understanding of various typical hazards and road safety features; and

2   To detect any changes resulting from the use of the resource.

In designing the tests, the following considerations were taken into account:

1   The activities had to be completed within a single lesson (usually 40 minutes);
2   They had to be applicable to the total age range;
3   They had to be capable of being administered to up to 40 children at a time;
4   They had to be motivating and non-threatening to the children;
5   They had to involve minimal writing.

Based upon the experience gained during the pilot stages of the project, the following activities were used. A summary is given in Table 6.2.

Table 6.2
Summary of the evaluation schedule

Activity	Pre-Test	Post-Test 1	Post-Test 2
Using the roads	✓		✓
Thinking about roads	✓	✓	✓
Roads quiz	✓		
Looking at photographs	✓	✓	✓
Travelling around		✓	

6.1.4 Pre-test

Using the Roads – an eleven question survey of children's use of the roads as a pedestrian and cyclist (see Appendix B).

Looking at Photographs – A series of questions based upon six photographs of typical road situations. Unlike the *Roads Quiz*, many of the questions were open-ended and required the children to consider appropriate strategies for action based upon their perception of the hazards inherent in the photographs. Year 3 (Y3/P3) children did not complete those questions which required writing (see Appendix C).

Roads Quiz – A multiple-choice test of road safety knowledge. A lack of time prevented some younger children from completing this activity (see Appendix D).

Thinking about Roads – a fourteen item questionnaire in which the children responded *Yes, No* or *Not Sure* to statements largely derived from comments made by children during the interview stage of the research. Year Three (Y3/P3) children only completed the first seven items (see Appendix E).

NB: All questions were read out to the children irrespective of their Year Group.

6.1.5 Post-test 1

Thinking about Roads – The same 14 questions were used but the order was randomised. All children completed all 14 items.

Travelling Around – An activity containing some elements from both *Using the Roads* and the *Roads Quiz.*

Looking at Photographs – A similar activity but with some new photographs.

6.1.6 Post-test 2

Using the Roads - The same activity as in the Pre-test.

Thinking about Roads - The same 14 questions in the order used in the pre-test.

Looking at Photographs - A similar activity but with some new photographs.

6.1.7 Coding and analysis

All answers were coded and entered into a database. No attempt was made at the coding stage to code the answers as *Correct* or *Incorrect.* Once the data had been entered, a group of researchers examined the responses to the *Looking at Photographs* activity and assigned a score between zero and one to each response. [For example, in a question which required three pieces of information for a correct answer, each piece of information was assigned a score of 0.33]. The maximum score on each question was one. A total score for each activity was then computed for each child. Most of the analysis was undertaken using the SIMSTAT package (Péladeau, 1994). Much of the data was categorical rather than quantitative and thus non-parametric tests were normally appropriate. In cases of ordinal data (eg frequency of an action on a scale from *Always* to *Never*), the scores were sometimes considered as a quantitative measure and parametric tests were also applied. Care must be taken in the interpretation of these results and, normally, a higher significance level was adopted.

6.2 Pre-test results – Using the roads

For many children, the journey to and from school represents a major part of their daily use of the roads. In the present study, for the journey to school, the most frequent method was to walk with an adult (29%). Three other methods (walking on own, walking with friends, and going by car) had similar incidences (18-19%). The frequency of walking with siblings (either younger or older) was lower (11%). Few children in this sample travelled either by bus (4%) or by bike (0.4%).

On the journey home from school, the proportion of those children who walked with an adult increased slightly (32%) as did the proportion who walked with friends (21%). Fewer children walked home with siblings (9%) or travelled by car (16%).

Less than one in five children (19%) said that they did not cross any roads at all on their own. Two children in five (41%) crossed the *nearest road to their house* and over a quarter (28%) crossed *all the roads* nearby on their own. Only 12% of children said that they crossed *all roads* on their own.

6.2.1 Using the roads by sex of child

Of the 1,122 children in the pre-test sample, 549 (49%) were boys. The sex distribution of the sample was independent of both Year Group (using Kolmogorov-Smirnov test $D_{max} = 0.062$; $D_{.05} = 0.081$) and area of Britain ($\chi^2 = 5.89$ for df 6). The analysis of the use of the roads by sex suggested that, overall, boys were less supervised than girls (Table 6.3). Boys were more likely to:

- Walk by themselves to school (Figure VI.2)
- Walk by themselves from school (Figure VI.3)
- Cross all roads on their own (Figure VI.4)
- Play out in the street most days (Figure VI.5)

Girls were more likely to:

- Walk with an adult to school (Figure VI.2)

- Walk with an adult from school (Figure VI.3)

- Wear their cycle helmet always (bike owners only) (Figure VI.6)

There was no sex difference in terms of:

- Bike ownership

- Frequency of riding bike (bike owners only)

- Ride their bike on the road

- Cycle helmet ownership (bike owners only)

- Frequency of using seat belt (car passengers only)

- The mean age at which they thought that they would be able to cross any road safely on their own.

Table 6.3
Comparison of the use made of the roads by boys and girls (see Appendix B)

No	Question and Answer	% Boys	% Girls	χ^2 (sig level)
1	Usually when I come to school, *I walk by myself*	23	14	27.96***
1	Usually when I come to school, *my Mum or Dad or another grown-up walks with me*	22	34	
2	Usually when I go home from school, *I walk by myself*	22	13	21.05***
2	Usually when I go home from school, *my Mum or Dad or another grown-up walks with me*	27	36	
3	I cross these roads on my own – *all roads*	17	7	23.92***
5	I play out in the street – *most days*	46	35	14.10**
10	When I'm riding my bike in the street, I wear my cycle helmet – *always* (helmet owners only)	48	64	24.54***
6	I have a bike of my own – *Yes*	87	84	1.26
7	I ride my bike – *most days* (bike owners only)	33	29	2.76
8	I usually ride my bike – *on the road*	59	44	2.31
9	I have a cycle helmet – *Yes*	49	44	2.49
11	When I'm in a car, I wear my seat belt – *always*	80	85	4.01

*** $p<0.001$; ** $p<0.01$.

Figure VI.2
Journey to school by sex of child
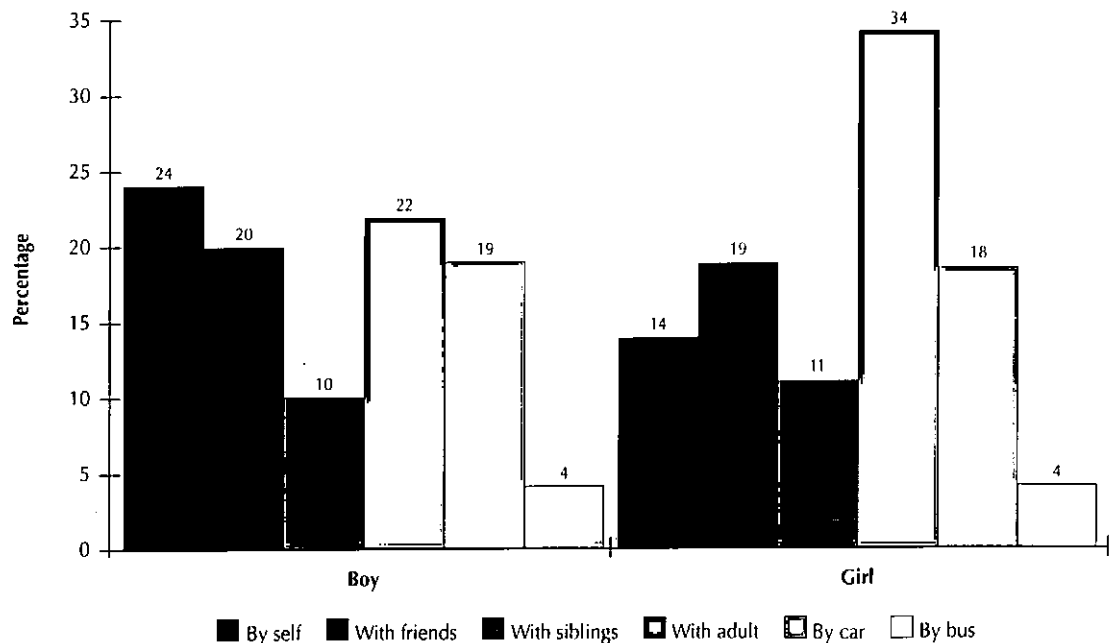
Legend: ■ By self ■ With friends ■ With siblings □ With adult ▣ By car □ By bus

Figure VI.3
Journey from school
by sex of child

Figure VI.3 — Journey from school by sex of child

Legend: ■ By self ■ With friends ■ With siblings □ With adult ▣ By car □ By bus

Boy: 22, 21, 8, 27, 17, 4
Girl: 13, 22, 9, 36, 16, 4

Figure VI.4
'I cross these roads
on my own' by sex
of child

Figure VI.4 — 'I cross these roads on my own' by sex of child

Legend: ■ No roads ■ Nearest to house □ All roads nearby ▣ All roads

Boy: 17, 38, 28, 16
Girl: 20, 44, 28, 7
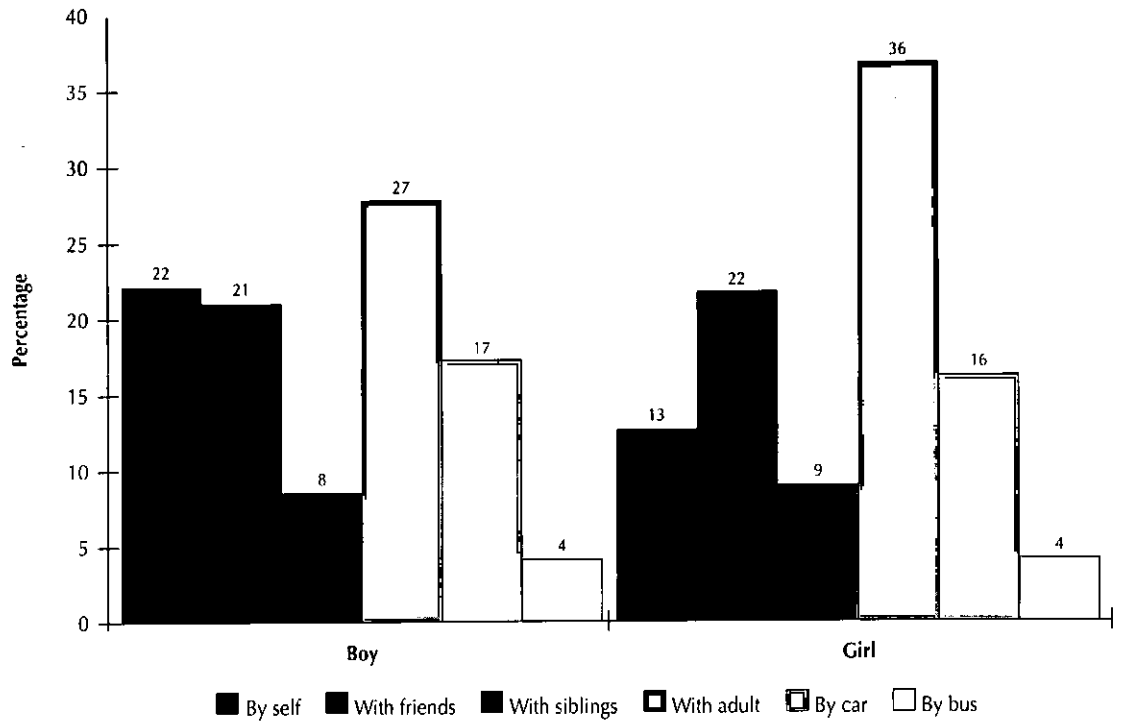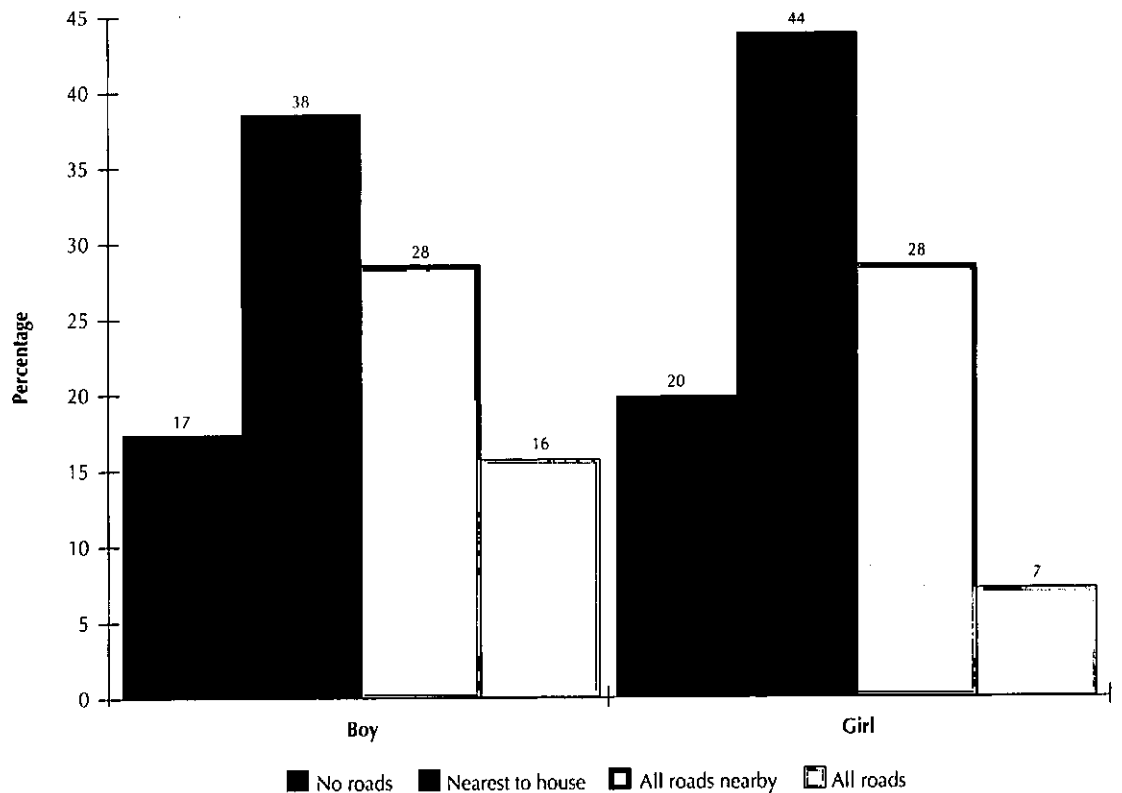
**Figure VI.5
Frequency of playing
out by sex of child**

Most days ■ Sometimes □ Hardly ever ▣ Never
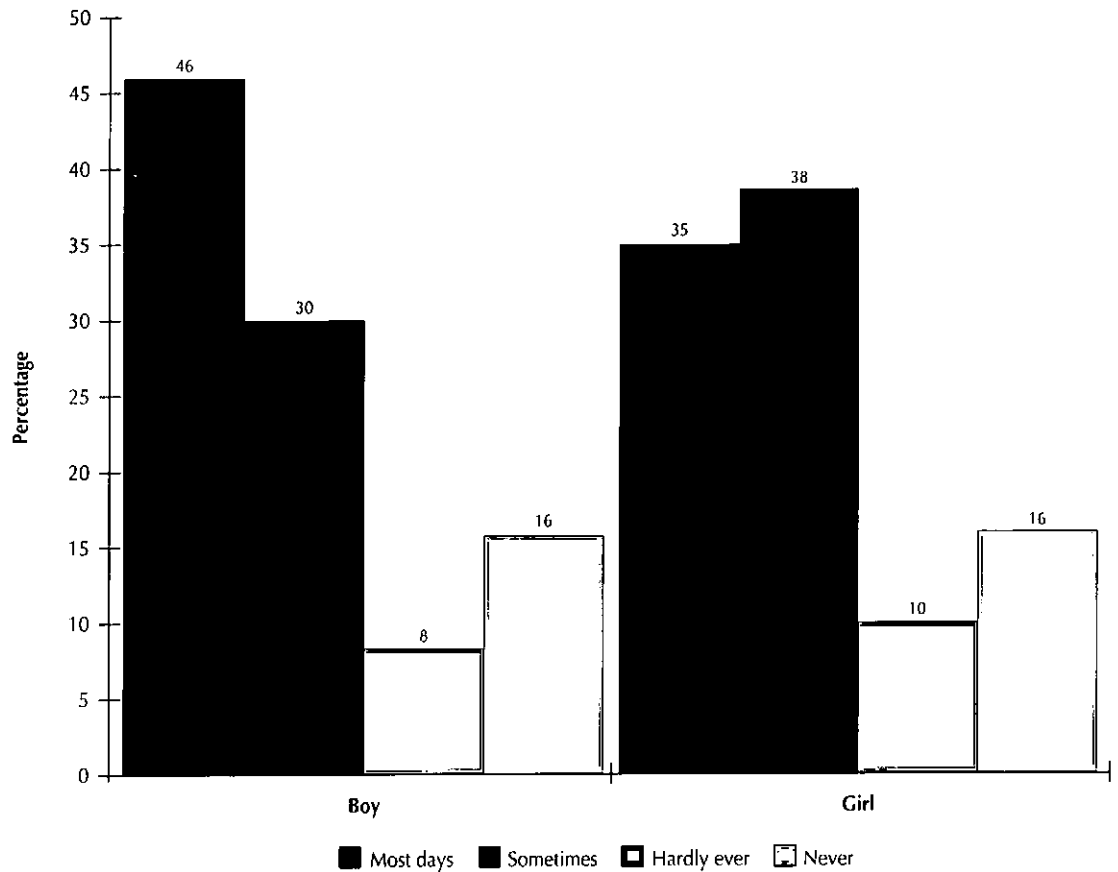
**Figure VI.6
Frequency of wearing
a cycle helmet by sex
of child**

■ Always □ Usually ▣ Hardly ever
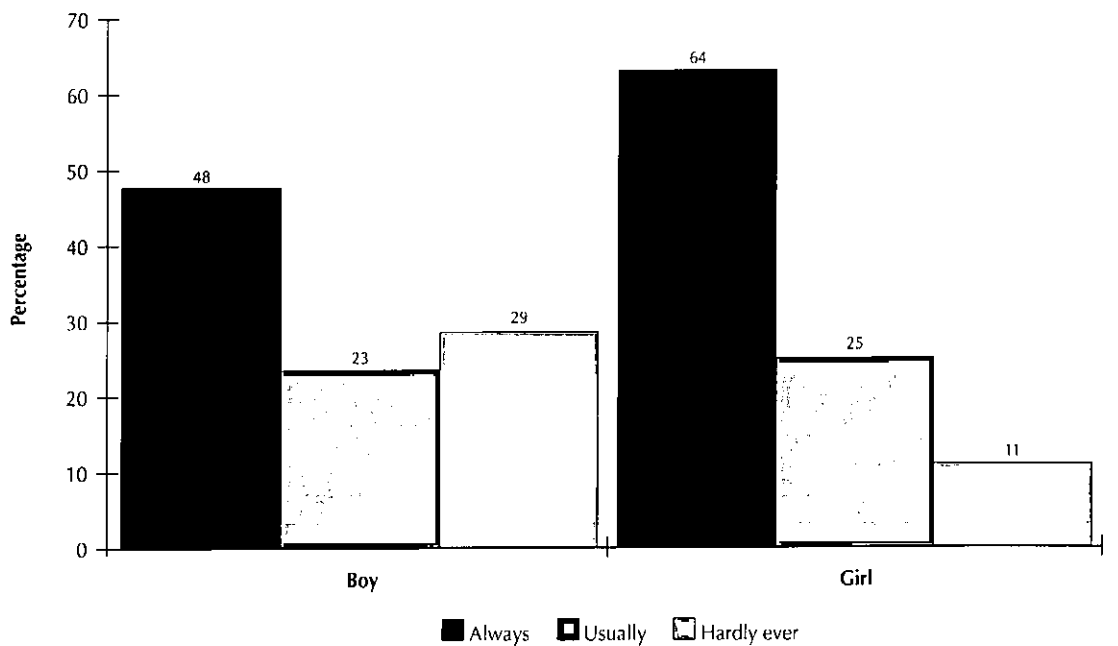
6.2.2 Using the roads by year group of child

Of the 1,122 children, 97% were in Year Groups 3, 4 and 5. The remaining 34 children from a Year 6 class in Warminster have been omitted from this part of the analysis. Year Group is an approximate indication of the age of the child. It should be noted, however, that Scottish children are, on average, about six months younger than their counterparts in the same Year Group in England and Wales. This difference is due to the different cut-off dates for entry to primary school in Scotland and England and Wales. The analysis of the use of the roads by Year Group suggested that, with increasing Year Group, the children become more independent road users.

With increasing Year Group, children are more likely to:

- walk to school with friends (Figure VI.7)
- walk home from school with friends (Figure VI.8)
- cross *all the roads nearby* (Figure VI.9)

With increasing Year Group, children are less likely to:

- walk to school accompanied by an adult (Figure VI.7)
- walk home from school accompanied by an adult (Figure VI.8)
- ride their bike *most days* (bike owners only) (Figure VI.10)

There appears to be no relationship between Year Group and:

- frequency of playing out in the street
- bike ownership
- riding the bike on the road (bike owners only)
- cycle helmet ownership (bike owners only)
- frequency of wearing cycle helmet (helmet owners only)
- wearing of seat belt (car passengers only)

The age at which children in Year Group 3 (12.0 years) think that they will be able to cross all roads safely on their own was significantly higher than that for Year Groups 4 and 5 (11.0 and 11.1 years respectively) ($F_{2,1081} = 5.99$; p<0.01).

Figure VI.7
Journey to school
by year group
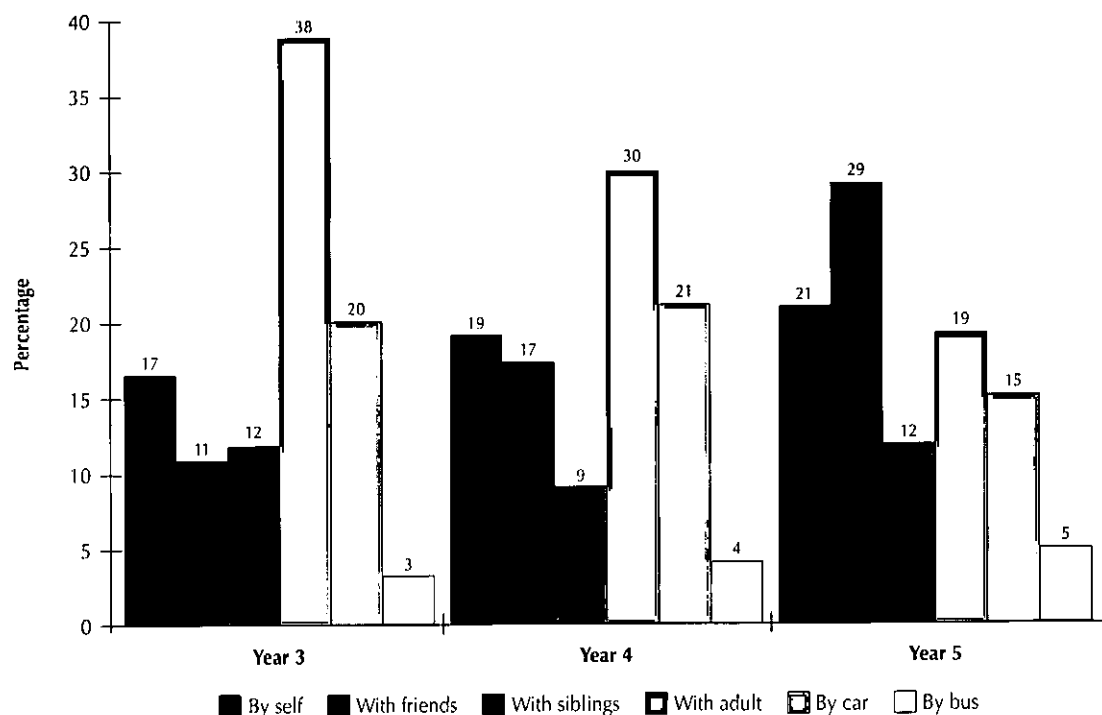
Legend: ■ By self ■ With friends ■ With siblings ▢ With adult ▢ By car ▢ By bus

Figure VI.8
Journey from school
by year group

By self   With friends   With siblings   With adult   By car   By bus
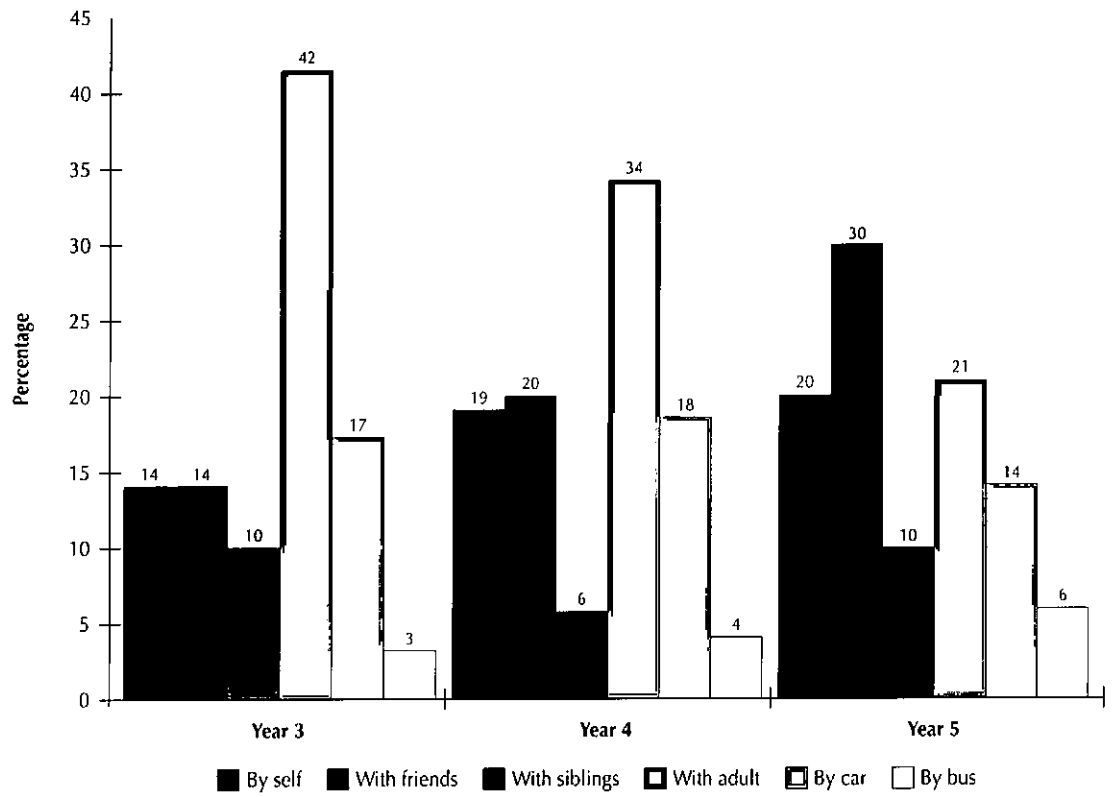
Figure VI.9
'I cross these roads on
my own' by year group

No roads   Road outside house   All roads nearby   All roads
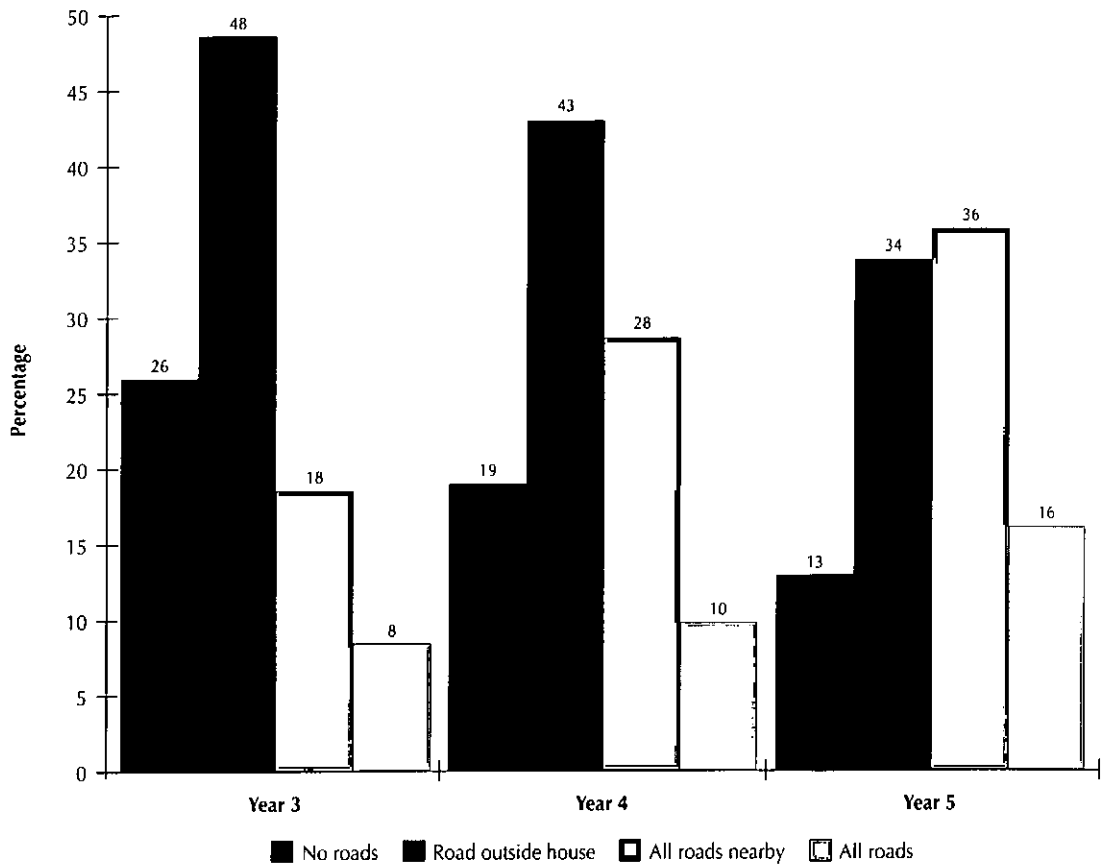
Figure VI.10
Frequency of riding
bike by year group
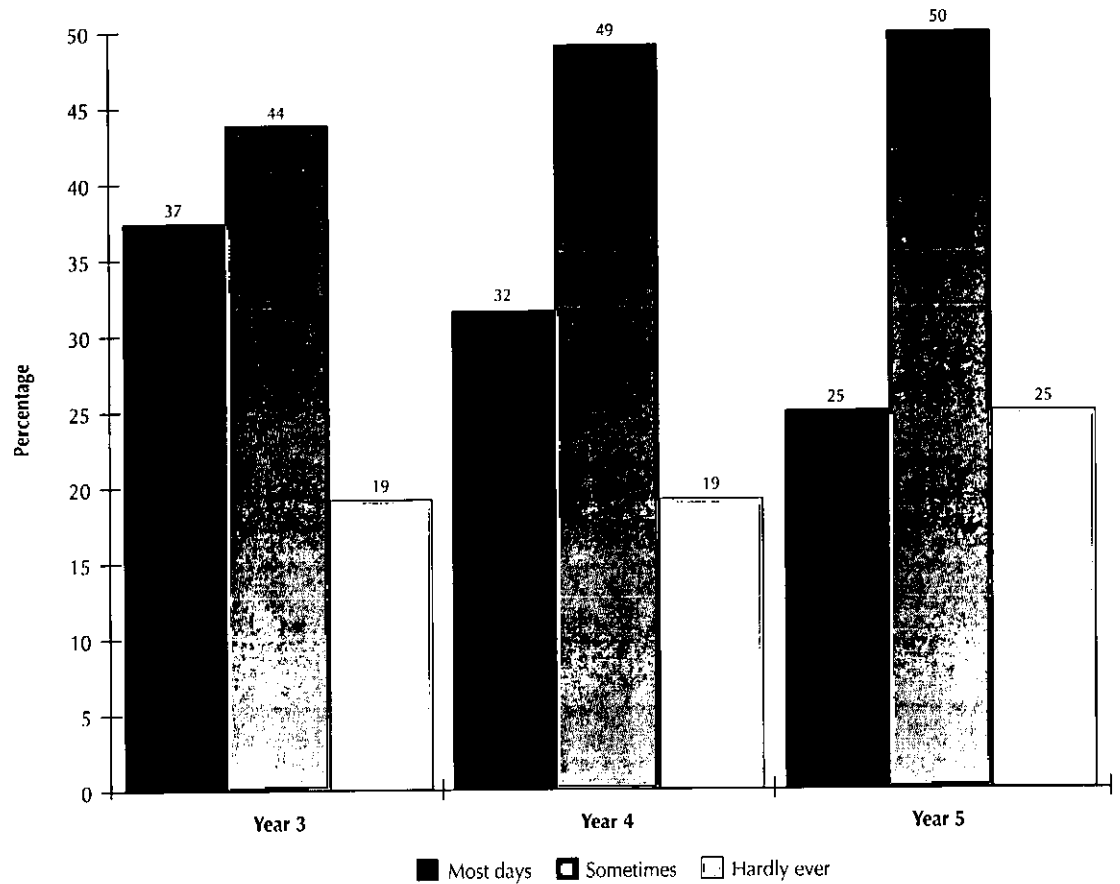
6.2.3 Using the roads by area of Britain

Year 6 children in Warminster were excluded from this analysis. A visual inspection of the resultant distribution of Year Group by Area (Figure VI.11) suggested that children in Walsall tended to be in higher Year Groups than other areas ($\chi^2 = 27.71$ for df 12; p<0.05). Although, overall, the most frequent journey type to school was to walk with an adult (29%), there were substantial variations throughout Britain (see Appendix F Figure F.1). In Sunderland and Rhayader, the most frequent journey type was by car. Rhayader was the only area in which buses (25%) were also used to any great extent, no doubt due to the large school catchment areas in rural Wales. By contrast, in Glasgow, the most frequent journey type was to walk with friends (27%).

Figure VI.11
Year groups by area
of Britain
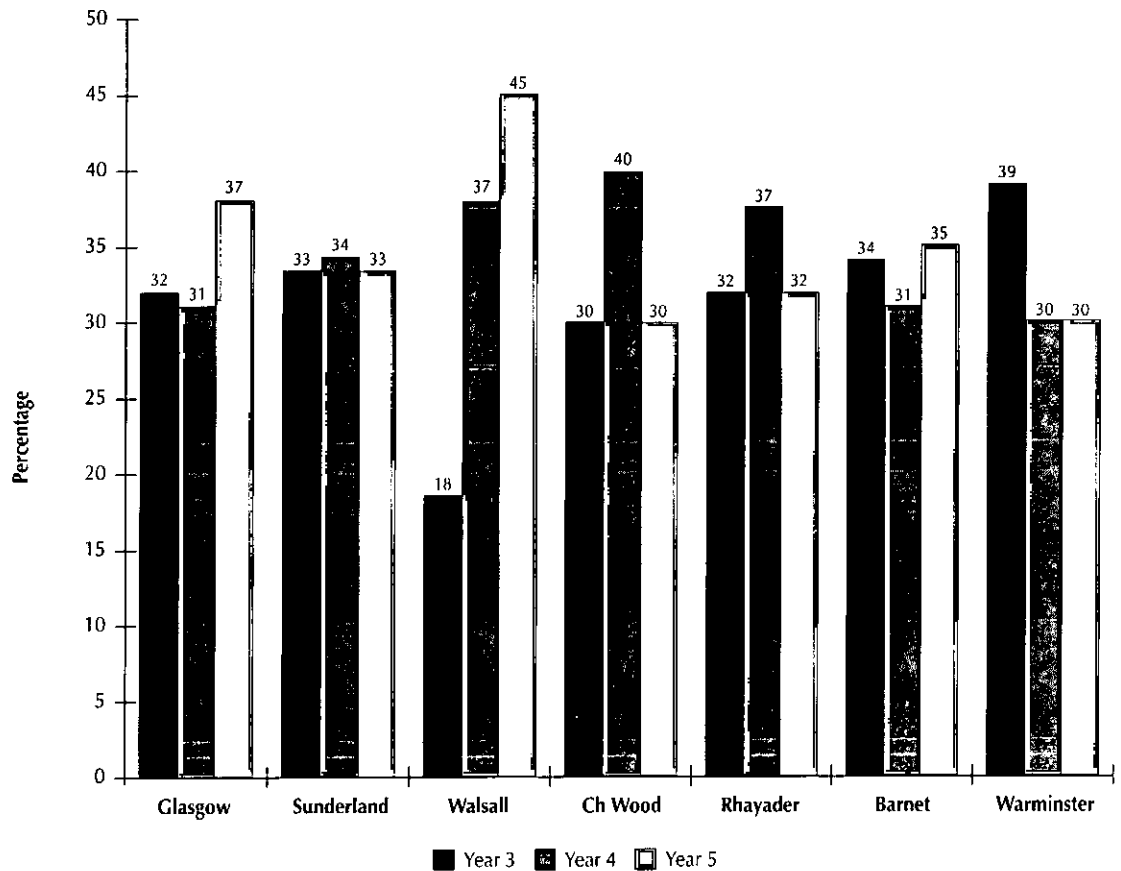
Similar patterns were apparent for the journey home from school (Figure F.2) except in Sunderland where walking with friends became the most frequent journey type. It might appear that, in Sunderland, parents were dropping their children at school whilst on their way to work and leaving them to walk home after school. Just over half the children (51–52%) were accompanied both to and from school (walking with an adult or as a car or bus passenger) (Figures F.3 and F.4). Accompaniment to school was highest in Rhayader (73%) and Warminster (67%) and lowest in Glasgow (35% to school and 33% from school).

Around two children in five (41%) cross only the nearest road to their house by themselves (Figure F.5). Over a quarter (28%) cross all the roads nearby. The most supervised children appear to be in Barnet where a third (34%) cross no roads on their own and only 8% cross all roads. In contrast, in Sunderland, only 16% cross no roads and 15% cross all roads.

About two children in five (40%) play out in the street most days. A third (34%) play out sometimes and the remainder play out hardly ever or never (Figure F.6). Playing out in the street most days is most popular in Sunderland and Chelmsley Wood (56%) and least likely in Rhayader (18%). In Rhayader, there may be more opportunities to play out away from the roads.

About 85% of children owned a bike; the rate varied from 76% in Barnet to 95% in Sunderland (Figure F.7). About a third of children (31%) claimed to ride their bike most days. A further 47% said that they rode their bike sometimes. Children in Rhayader appeared to make most use of their bikes – 54% of bike owners there said that they rode their bike most days. In contrast, only 24% of children in Barnet and Sunderland claimed the same level of usage. (Figure F.8). Most children (56%) said that they rode their bike on the roads (Figure F.9). A quarter (25%) rode them on the pavement and the remainder (19%) only rode away from roads. The highest usages on the road were in Sunderland (76%) and Warminster (73%); the lowest in Rhayader (32%) where the rural area may provide more scope for riding away from roads.

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Plate VII
The crossroads

Table 6.12
Errors in answers to Question 6b of Looking at Photographs

Error	No	%
Omitted left turn manoeuvre	178	25.6
Omitted straight on manoeuvre	242	34.8
Omitted right turn manoeuvre	276	39.7
TOTAL	696	100.0

Table 6.13
Distribution of answers to Question 6c of Looking at Photographs

	No	%
Up and left in front of blue car	54	5.3
Close to junction		
Up and left	457	44.7
Left and up	315	30.8
Diagonal route	80	7.8
Walked away from junction before crossing		
Up and left	71	6.9
Left and up	15	1.5
Walked up middle of N-S road	23	2.3
Walked along middle of E-W road	6	0.6
Other route	1	0.1
Not answered	100	
TOTAL	1122	100.0

Table 6.10
Distribution of answers to Question 5b of Looking at Photographs

Pedestrian refuges make it easier for people to cross the road because:	No	% response
You only have to look for traffic from one direction at a time	354	33.1
The traffic should stop to let you cross the road	446	41.7
The traffic always goes slower there	269	25.2
Not answered	53	–
TOTAL	**1122**	**100.0**

Table 6.11
Crosstabulation of answers to Questions 5a and 5b of Looking at Photographs

Pedestrian refuges make it easier for people to cross the road because:	Should you stop to let the man cross the road?		
	Yes	No	TOTAL
You only have to look for traffic from one direction at a time	272 (31%)	82 (42%)	354
The traffic should stop to let you cross the road	398 (46%)	48 (25%)	446
The traffic always goes slower there	205 (23%)	64 (33%)	269
TOTAL	**875 (100%)**	**194 (100%)**	**1069**

6.3.6 Question 6 – The crossroads

Question 6 used a colour photograph of a crossroads (Plate VII) together with a plan to determine if children were aware of the possible directions in which vehicles might travel and also the appropriate routes to take when crossing diagonally. Question 6a checked that children could match the photograph to the plan by asking them to mark the position of the blue car. (NB: This question was not written on the question paper). Most children (72%) got the answer correct. Those who answered incorrectly largely placed the car well behind the Give Way lines. In Question 6b (Table 6.12), children were asked to draw lines with arrows showing all the possible directions in which the blue car could travel. Half the children (54%) gave a totally correct answer. Of those that gave a partly correct answer, the commonest error was to omit the turning right manoeuvre (40% of answers). (NB: Some children omitted more than one manoeuvre). Question 6c investigated the children's choice of routes from Point X on the plan to the petrol station. In analysing the routes chosen, a differentiation was made between those who crossed both roads close to the junction and those who walked away from the junction before crossing. Most (73%) crossed close to the junction, including 5% who crossed in front of the blue car (Table 6.13). Only a small minority (8%) walked away from the junction before crossing, about the same proportion as those who took the potentially most dangerous route – diagonally across the junction.

The last question (Question 4c) asked to what colour the traffic lights would change next. About two-thirds (62%) of the sample knew that the traffic lights would change to green. Most of the remainder (28%) thought that it would change to red. The relationship between the answers to Questions 4b and 4c was also examined. The relevant answers to Question 4c given the answer to Question 4b form the diagonal in the crosstabulation and are shown in bold (Table 6.9). Although the chi-square value is significant (56.23 for df 4; p<0.001), there is no significant correlation between the two sets of answers (Gamma = -0.01).

Table 6.9
Crosstabulation of answers to Questions 4b and 4c of Looking at Photographs

Present colour of pedestrian lights	Next colour of traffic lights			TOTAL
	Red	Yellow	Green	
Red man showing	55	51	179	285
Green man showing	77	21	110	208
Flashing green man showing	163	22	343	528
TOTAL	295	94	632	1021

6.3.5 Question 5 – The pedestrian refuge

The photograph in Question 5 (Plate VI) shows a man standing on a pedestrian island. There is a difference in the road surface at this point but it is clearly not a crossing at which pedestrians have priority. When asked "If you were riding your bike towards the pedestrian refuge should you stop to let the man cross the road?", most children (78%) said that they would stop. Despite the high percentage who would stop to let the man cross, only 40% of children thought that pedestrian refuges make it easier for people to cross the road because the traffic should stop (Table 6.10). The answers appeared interrelated in that those children who answered Yes to Question 5a were more likely to suggest that traffic should stop at pedestrian refuges to let you cross the road (46% versus 25%) (χ^2 = 28.14 for df 2; p<0.001) (Table 6.11).

Plate VI
The pedestrian refuge

Plate V
The pelican crossing

The first question (Question 4a) simply asked if the child would cross the road now. Nearly two-thirds (62%) of the sample said that they would not cross the road now. Question 4b asked what colour were the pedestrian lights at the time the photograph was taken. Nearly half the sample thought that the *Flashing Green Man* was showing at the time (Table 6.7). The remaining answers were about equally divided between the *Red Man* and the *Green Man.*

Table 6.7
Distribution of answers to Question 4b of Looking at Photographs

What colour are the pedestrian lights at the moment? Is the:	No	% response
Red man showing	287	28.0
The green man showing	209	20.4
The flashing green man showing	528	51.6
Not answered	98	
TOTAL	**1122**	**100.0**

It might be believed that the children's decision as to whether they would cross the road is dependent upon what colour they believe the pedestrian lights to be. As Table 6.8 suggests, children who believe the Green Man is showing are more likely to cross than those who believe that either of the other two phases are in operation ($\chi = 40.15$ for df 2; p< 0.001)

Table 6.8
Crosstabulation of answers to Questions 4a and 4b of Looking at Photographs

What colour are the pedestrian lights? Is the:	Cross road now?		
	Yes	No	TOTAL
Red man showing	98	189	287
Green man showing	120	89	209
Flashing green man showing	175	352	527
TOTAL	393	630	1023

Table 6.6
Distribution of answers
to Question 3b of
Looking at
Photographs

Draw a line on your plan to show the route you would take [riding your bike] from the blue Metro to the High Street.	% response
Correct way around roundabout	
1 middle of road	43.1
2 outside line	6.2
3 inside line	10.9
Correct way but wrong side of exit road	
5 outside line on roundabout	5.1
7 inside line on roundabout	1.5
Incorrect way around roundabout	
Round roundabout once	28.2
Round roundabout twice	2.1
Miscellaneous	
On pavement	1.5
Across central island	1.4
TOTAL	**100.0**

The final question about this photograph had no right or wrong answer. It was merely a preference for riding the bike or walking with it around the particular roundabout. Overall, the sample had a slight preference for walking with their bike (54%) rather than riding it (46%).

6.3.4 Question 4 – The pelican crossing

The photograph (Plate V) shows people crossing the road at a pelican crossing. The lights for the drivers show amber and there are cars on either side of the crossing. The pedestrian lights are not visible. There are two possible scenarios. The least likely is that the drivers' lights are showing steady amber and the pedestrians are crossing while the *Red Man* is showing and forcing the cars to wait. The more probable scenario is that the amber light is flashing, the last pedestrians are crossing on the flashing *Green Man* and that the cars are waiting for their lights to change to green and the last pedestrians to reach the pavement.

Table 6.5
Distribution of answers
to Question 2b of
Looking at
Photographs

What should you look for that might tell you that a parked car is about to move off?	% of sample	% of answers
Driver/person in car	33.9	23.5
Lights	33.8	23.5
Noise/engine starts	31.3	21.8
Indicators	13.3	9.3
Exhaust/smoke	12.2	8.5
Lights at back	6.7	4.6
Reversing lights	5.4	3.7
Red brake lights	4.2	2.9
Wheels moving	3.1	2.1
TOTAL	100.0	100.0

6.3.3 Question 3 – The roundabout

The first question (Question 3a) was designed to check whether children could match the colour photograph of the roundabout provided to them (Plate IV) with the plan shown on their answer sheet. Over two-thirds of children located the vehicle at the mouth of the correct arm of the junction and a further 17% placed the car in the correct arm but too far from the roundabout. Only 6% of children placed the car in completely the wrong position.

Plate IV
The roundabout

Question 3b tested the child's ability to plot a route around a roundabout on a bike. About two-thirds of the children plotted the correct route around the roundabout itself although about one in ten of these children drew the line down the wrong side of the exit arm (Table 6.6). Nearly a third of children (30%) plotted their route the wrong way (anticlockwise) around the roundabout.

6.3.7 Analysis by age, area and sex

As described earlier (Section 6.1.7), the range of responses to each question was assessed by a group of researchers and a score (between zero and one) was assigned to each response. The maximum score on each question was one. [For example, in a question which required three pieces of information for a correct answer, each piece of information was assigned a score of 0.33.] The score for each question was then summed to provide a total score for the activity.

An analysis of the total score by age and sex suggested that the main Year Group and area of Britain effects were significant (p<0.001) but that the main sex effect was not. For Year Group, the broad trend was for older children to score higher. Although younger (P3/Y3) children were not asked to answer some questions, similar trends were observed for all individual questions except Questions 1 and 4A.

The analysis by area of Britain was undertaken using Year Group as the other main effect. Adjusted means for the areas by year group are shown in Figure VI.12. In general, the highest year group means were in Sunderland and the lowest in Glasgow and Walsall. It should be noted that the use of year group as the age adjustment does not take sufficient account of the younger ages of Glasgow children. Differences between areas may largely reflect the prior amount of road safety education received by the children concerned.

Figure VI.12
Looking at
Photographs –
mean score by year
group and area
of Britain
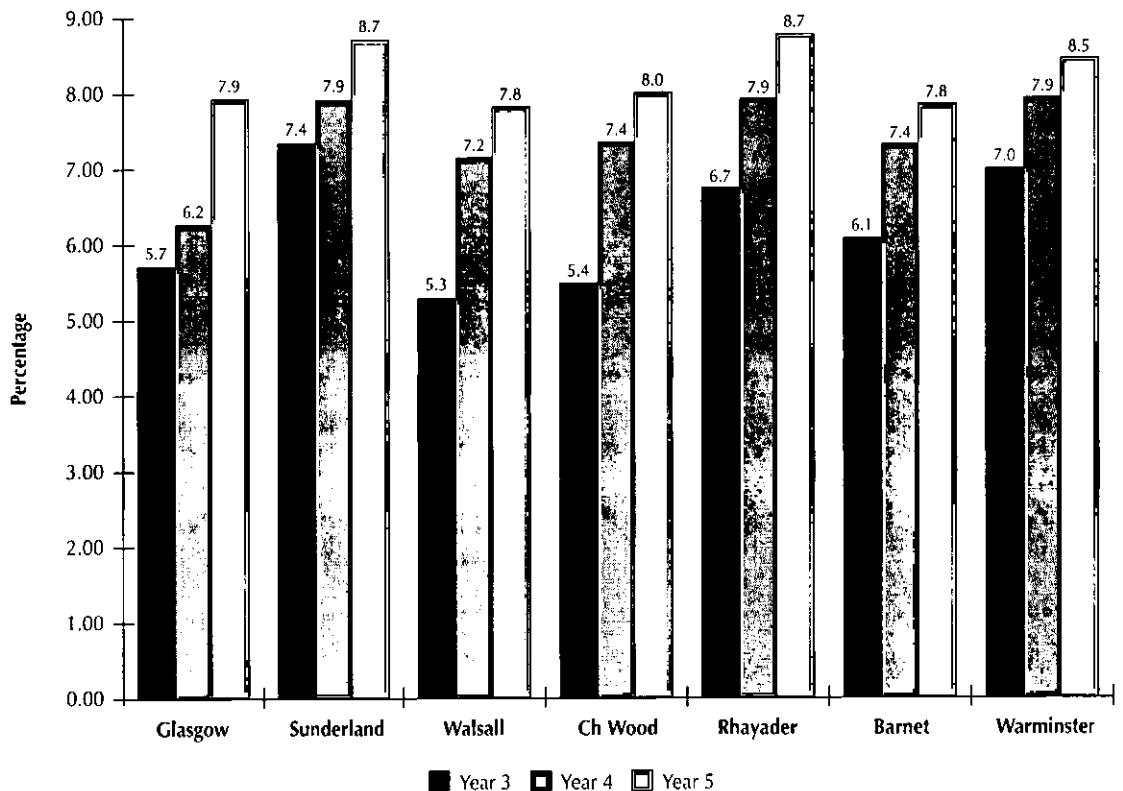
Only two questions showed any significant difference with sex. For Question 3a, boys were more accurate at marking the position of the black car on the plan (p<0.05). In Question 5a, girls were more likely to stop their bike to let the man cross the road (p<0.05).

6.4
Pre-test results –
Roads Quiz

The Roads Quiz (see Appendix D) was a test of knowledge of road safety, apart from one question (Question 5) on estimating distances which has been excluded from the present analysis. In the pre-test, the Roads Quiz was completed by 732 children. The test was not given to some younger children because of a lack of time. Table 6.14 gives the percentage correct answers for the eight questions. The highest percentage of correct answers was for Question 2 (Circle the senses you must use to cross the road safely).

Of the identification of the types of road signs, signs with blue rectangles achieved the highest percentage of correct answers (58.1). The correct identification of the Pedestrians in Road sign was done by a substantially lower percentage of children (37.8%) than those who correctly identified signs with red triangles as being warnings (50.1%). The lowest percentage of correct answers was for the estimation of the number of children who die in road accidents each year (30.7%).

Table 6.14
Summary of responses
to Roads Quiz

No	Question	% correct
2	Circle the senses you must use to cross the road safely.	85.7
3c	Signs with blue rectangles give –	58.1
3b	Signs with red triangles give –	50.1
6	Guard rails at the edge of the pavement –	49.2
3a	Signs with red circles give –	48.6
7	When riding your bike, to turn right safely, you must:	41.7
4	This sign means:	37.8
1	About how many children die in road accidents?	30.7

One point was given to each correct answer and a total score for the complete quiz was calculated. Analyses of variance were performed on the individual question scores and the total score to determine the effects of Year Group and sex on the results. For the total score, only the age effect was significant, with the mean score increasing with age (Table 6.15).

Table 6.15
Mean total score for
Roads Quiz by Year
Group

Year Group	Mean total score	N
Y3	4.16	82
Y4	4.69	266
P5	5.32	80
Y5	5.15	266
Y6	6.21	38

A comparison of all Year Groups means with each other suggested that Year 6 children scored significantly higher on the *Roads Quiz* than all lower Year Groups and that Year 5 children (both P5 and Y5) score significantly higher than Year 3 and Year 4 children.

Comparisons of the individual question scores by age group suggested that the difference in the total score was largely due to differences in the scores on the following questions:

Q1   *About how many children die in road accidents?* Younger children tend to underestimate the number killed.

Q3c   *Signs with blue rectangles give* – No discernible trend.

Q6   *Guard rails at the edge of the pavement are designed to:* Younger children tend to suggest that guard rails are designed to keep animals off the road.

Q7   *When riding your bike, to turn right safely, you must:* Younger children tend to suggest that you should signal right first.

Full details of the distribution of answers to the individual questions in the Roads Quiz are provided in the Technical Annex to this report.

6.5
Pre-test results - Thinking about roads

Thinking About Roads (see Appendix E) consisted of fourteen statements to each of which the children were asked to circle the appropriate answer according to whether they agreed (wanted to say 'Yes'), disagreed (wanted to say 'No') or were not sure. In four cases, an additional box was provided for children who had no experience of using pelican crossings (Statements 2 and 6), cycle helmets (Statement 4) or riding in a car fitted with seat belts (Statement 12). The responses were coded as frequencies and also as scores – assigning one to a 'Yes', two to a 'Not Sure' and three to a 'No' answer. Analyses involving Statements 2,4,6 and 12 were undertaken after omitting any subjects who ticked Box 4 (no experience). All children (N=1122) completed the first page (Statements 1-6) of *Thinking about roads*. Six Year 3 classes, containing a total of 182 children did not complete the second page (Statements 7–14) because of lack of time. Table 6.16 provides the percentage of children who agreed with the statement together with the mean score in order of decreasing agreement.

6.5.1 Analysis by age and sex

Analyses of variance were performed on all statement scores to determine the effects of age group, sex and their interaction. Where the age group effect was significant, correlations between age group and statement scores were also calculated. The results suggested that, with increasing age, the trend was – for greater agreement that:

- It's up to me to make sure that I am safe on the road.
- I feel silly holding a grown-up's hand to cross the road.
- If I don't look before I cross the road, it'll be my fault if I get run over, and

for greater disagreement that:

- You have to be a good driver to drive fast.
- I like wearing my cycle helmet.
- If there's no traffic near, my friends would laugh at me if I said "Let's wait for the Green Man".

The analysis by sex suggested that boys tended to show greater agreement with the following statements:

- I like being in a car when it's going really fast.
- I feel silly holding a grown-up's hand to cross the road.

and greater disagreement with:

- I like wearing my cycle helmet.
- I feel safer in a car when I'm wearing a seat belt.

Table 6.16
Percentage agreement
and mean score by
statement from
Thinking about Roads

No	Statement	% agreement	Mean Score[1]
12	I feel safer in a car when I'm wearing a seat belt	94.6	1.09
1	When I'm out with a grown-up, it's up to them to make sure I am safe on the road	80.5	1.33
11	If I don't look before I cross the road, it'll be my fault if I get run over	78.7	1.09
7	It's up to me to make sure that I don't get knocked down by a car	71.0	1.25
9	Quiet roads are much less dangerous to cross than busy roads	67.2	1.32
4	I like wearing my cycle helmet	71.0	1.74
13	You have to be a good driver to drive fast	53.7	1.62
8	Most drivers drive too fast on the roads I use	46.9	1.76
10	Pedestrians shouldn't cross between parked cars	43.8	1.84
2	If there's no traffic near, my friends would laugh at me if I said "Let's wait for the Green Man"	43.1	1.95
5	I feel silly holding a grown-up's hand to cross the road	40.5	2.10
14	Most accidents involving children crossing the road are the driver's fault	31.8	2.02
3	I like being in a car when it's going really fast	31.4	2.29
6	It's OK to cross on the Red Man if there's no traffic near	26.4	2.39

[1] The higher the score the greater the disagreement

Chapter 7   The main study – 2 Evaluation

7.1 Pre-test and post-test 1 comparison

Details of the various activities used in the pre-test and two post-tests are given in Table 6.2.

7.1.1   Looking at photographs

The *Looking at Photographs* activity used in post-test 1 was an extended version of that used in the pre-test. Some of the photographs and associated questions were the same; others were new. The main reason for the change was to ensure that the children did not become bored undertaking exactly the same activity on all occasions.

To evaluate the effect of the teaching of the resource upon the scores for the *Looking at Photographs*, an analysis of covariance was performed on the data using the score on the pre-test as the covariate. Individual scores were calculated using the technique outlined in Section 6.1.4.

Table 7.1 and Figures VII.1–VII.3 summarise the results. Overall, the experimental group had a higher adjusted mean than the control group (p=0.024). Significant differences were also found for girls, Walsall and Barnet, and Year Group 3. In all these cases, the experimental group scored significantly higher than the control group.

NB: Comparisons should only be made between the experimental and control groups. The scores of the various year groups are not comparable as the younger Year Groups answered fewer questions than the older Year Groups.

Table 7.1
Looking at Photographs – Adjusted means scores post-test 1

Sample	Sample Size	Adjusted mean scores		Probability Level
		Control Group	Experimental Group	
Total sample	980	14.3	15.8	.024
Sex Male	489	14.6	15.7	
Female	491	14.1	15.9	.004
Area Glasgow	182	12.7	13.7	
Sunderland	138	16.0	18.3	
Walsall	145	14.8	16.3	.025
Chelmsley Wood	153	14.7	15.0	
Rhayader	93	16.2	16.1	
Barnet	135	10.6	15.3	.003
Warminster	134	16.4	17.7	
Year Group 3	295	11.9	13.4	.014
4	334	14.4	15.7	
5	317	16.3	17.6	
6	34	19.3	19.6	

Figure VII.1
Looking at
Photographs –
Adjusted means for
total sample and by
sex of child

p=0.024 (N=980)   p=0.004 (N=491)

TOTAL   Male   Female

■ Control □ Experimental
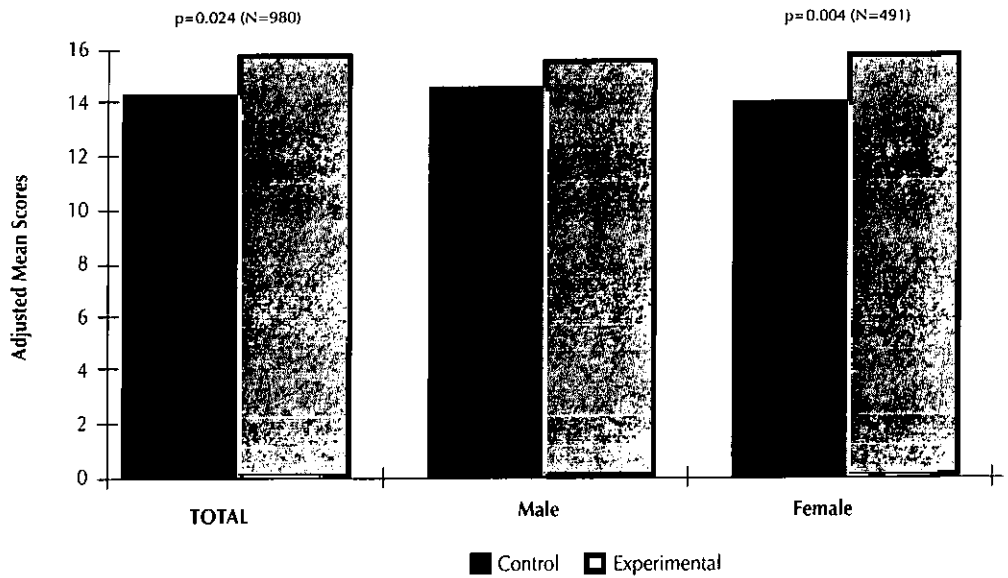
Figure VII.2
Looking at
Photographs –
Adjusted means by
area of Britain

p=0.025 (N=145)   p=0.003 (N=135)

Glasgow   Sunderland   Walsall   Ch Wood   Rhayader   Barnet   Warminster

■ Control ▦ Experimental
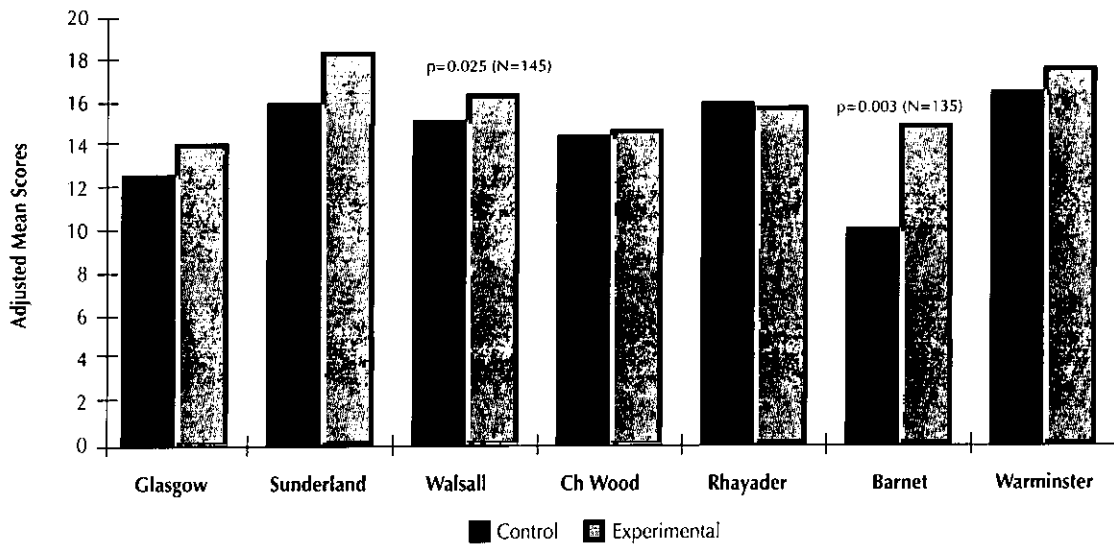
Figure VII.3
Looking at
Photographs –
Adjusted means by
year group

p=0.014 (N=295)

Year 3   Year 4   Year 5   Year 6

■ Control ▦ Experimental
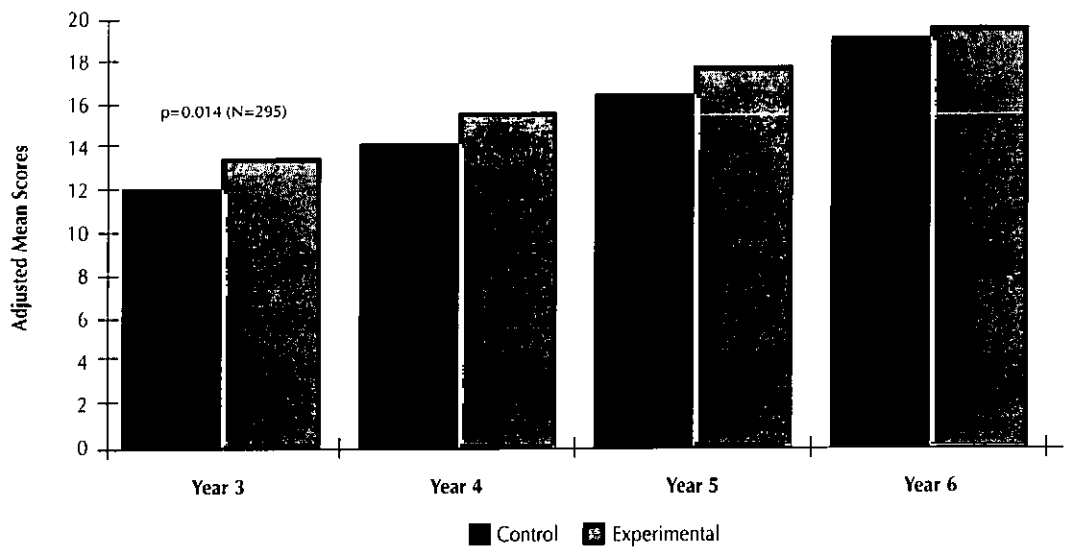
7.1.2 Roads quiz

The *Travelling Around* activity undertaken in post-test 1 contained five of the questions used in the *Roads Quiz* in the pre-test. Only the question about the identification of the three different types of road signs was omitted.

The sample consisted of 651 children who undertook both tests. As the pre-test score was highly correlated to the post-test score (children who scored highly on the first test were also likely to score highly on the second test), comparisons of means for the post-test were undertaken using analyses of covariance with the pre-test score being the covariate.

The results are summarised in Table 7.2. They suggested that the experimental group had a higher adjusted mean score than the control group (p = 0.007). Significant differences were also found for Year Groups 4 and 5, one of the seven areas of Britain and four of the five questions. In each instance the adjusted mean score of the experimental group was higher than that of the control group.

Table 7.2
Roads Quiz –
Adjusted mean scores
– post-test 1

Group	Sample Size	Adjusted mean scores		Probability Level
		Control Group	Experimental Group	
TOTAL	651	4.00	4.13	.007
Year Groups †				
Year 3	71	3.23	3.53	
Year 4	238	3.97	4.12	.034
Primary 5	67	3.82	3.94	
Year 5	241	4.17	4.30	.055
Year 6	34	4.47	4.86	
Areas				
Glasgow	67	3.82	3.94	
Sunderland	90	4.29	4.60	
Walsall	114	3.80	4.01	.041
Chelmsley Wood	126	3.52	3.58	
Rhayader	94	4.21	4.43	
Barnet		¶	¶	
Warminster	90	4.53	4.73	
Questions				
4 How many die...	651	0.64	0.66	.061
5 Circle the...	651	1.91	1.93	.041
6 This sign means...	651	0.45	0.33	
8 Guard rails...	651	0.57	0.68	.001
9 When riding...	651	0.40	0.54	.000

† Year Groups refer to England and Wales only. Primary 5 refers to Scotland only.
¶ No control group children in Barnet undertook the *Roads Quiz* in the pre-test because of time constraints.

7.1.3 Thinking about roads

The same questions were used in the post-test 1 version of this activity as were used in the pre-test version. Only the order was changed. A total of 947 children completed both the pre-test and post-test activities. Some of the Year 3 children only completed the first seven questions in the pre-test and thus the sample sizes for these questions are lower (around 800). The analysis was undertaken for the control and experimental groups separately using the Wilcoxon Matched-Pairs Signed-Ranks Test and the paired t-test for each question. A summary of the significant differences on both these tests is shown in Table 7.3.

Table 7.3
Thinking about Roads – Comparison of pre-test and post-test 1 mean scores

Statement	Control Group		Experimental Group	
	Pre-test	Post-test 1	Pre-test	Post-test 1
2　If I don't look before I cross the road, it'll be my fault if I get run over.	1.1	1.1 *	1.1	1.2 **
3　When I'm out with a grown-up, it's up to them to make sure I am safe.	1.3	1.7 ***	1.4	2.0 ***
4　You have to be a good driver to drive fast.	1.5	1.6 *	1.7	2.0 ***
5　Most accidents involving children crossing the road are the driver's fault.			2.0	2.2 ***
6　Quiet roads are much less dangerous to cross than busy roads.	1.3	1.4 *	1.3	1.5 ***
7　It's up to me to make sure I am safe on the road.			1.2	1.2 *
8　It's OK to cross on the Red Man if there's no traffic near.	2.4	2.2 **		

* p<0.05;　** p<0.01;　*** p<0.001

The results exhibited some inconsistency and any interpretation must be cautious. Amongst the experimental group, there was an increased awareness of personal responsibility for safety from Statements 3, 5, and 7 but this was negated, to an extent, by Statement 2. The control group showed conflicting views (Statements 2 and 3). The other significant differences were largely in favour of increased safety except, perhaps, for Statement 8 (Control Group) which demonstrated a move towards adult crossing behaviour.

7.2 Pre-test and post-test 2 comparison

Details of the various activities used in the pre-test and two post-tests are given in Table 6.2.

7.2.1 Looking at photographs

Looking at Photographs 3 (LAP3) was a combination of three questions from the *Roads Quiz* together with questions on five photographs.

Three analyses of covariance were undertaken:

1　Total LAP3 score using both *Looking at Photographs* (LAP) and *Roads Quiz* pre-test scores as the covariate;
2　Scores on photograph questions in LAP3 using LAP pre-test scores as the covariate;
3　Scores on Roads Quiz questions in LAP3 using *Roads Quiz* pre-test scores as the covariate.

Within each general analysis of covariance, analyses were undertaken for the total sample as well as separately by sex, year group and area (of Britain). Table 7.4 summarises the results for the total sample and the significant results from the sub-analyses. Using two

covariates and the total score, the experimental group had a significantly higher adjusted mean than the control group. Similarly, for girls, and for year group 4, the experimental group had a significantly higher adjusted mean score. Looking separately at the scores for the *Looking at Photographs* questions and the *Roads Quiz* questions, no significant differences were obtained between the control and experimental groups. However, for the *Looking at Photographs* scores only, girls in the experimental group had a significantly higher adjusted mean score than girls in the control group.

Table 7.4
Looking at
Photographs –
Adjusted mean scores
post-test 2

	Control Group	Experimental Group	Probability Level
Total score and 2 covariates			
Total sample	10.3	10.6	.032
Female	10.5	10.8	.028
Year 4	9.8	10.5	.037
Photograph scores			
Total sample	8.2	8.7	NS
Female	8.3	8.7	.018
Roads Quiz scores			
Total sample	1.6	1.6	NS

7.2.2 Thinking about roads

The same statements in the same order were used in both the pre-test and post-test 2. A total of 910 children completed both tests although, as mentioned previously, some of the Year 3 children completed only the first seven questions in the pre-test and thus the sample sizes for these questions are lower (around 750). The analysis was undertaken for the control and experimental groups separately using both the Wilcoxon Matched-Pairs Signed-Ranks Test and the paired t-test. Only those differences which achieved statistical significance on both tests are shown in Table 7.5 which summarises the key results. It should be noted that the pre-test samples used in this comparison are not identical to the pre-test samples used in the comparison with post-test 1 as only those children who completed the pair of tests are included in each comparison. The results suggested that significant differences existed for both the control and experimental groups. These changes may be partly as a result of maturation effects, including the move up to the next Year Group in the school.

Table 7.5
Thinking about Roads –
pre-test and post-test 2
mean scores

Statement	Control Group		Experimental Group	
	Pre-test	Post-test 2	Pre-test	Post-test 2
When I'm out with a grown-up, it's up to them to make sure I am safe on the road.	1.2	1.7 ***	1.4	2.0 ***
If there's no traffic near, my friends would laugh at me if I said: "Let's wait for the Green Man".	2.0	2.1 *	2.0	2.1 *
I like being in a car when it's going really fast.	2.4	2.2 ***		
I like wearing my cycle helmet.			1.7	2.0 **
It's OK to cross on the Red Man if there's no traffic near.			2.4	2.5 *
It's up to me to make sure that I am safe on the road.			1.2	1.1 **
Quiet roads are much less dangerous to cross than busy roads.	1.3	1.6 ***	1.3	1.6 ***
Pedestrians shouldn't cross between parked cars.	2.0	1.7 ***		
I feel safer in a car when I'm wearing a seat belt.	1.0	1.2 *	1.1	1.2 **
You have to be a good driver to drive fast.	1.6	1.7 **	1.7	2.1 ***
Most accidents involving children crossing the road are the driver's fault.	2.1	2.2 *	2.0	2.3 ***

* $p<0.05$; ** $p<0.01$; *** $p<0.001$

7.3
Teachers'
evaluation

All the schools, both experimental and control, claimed that road safety education formed part of the children's education. The most common approach used by all the schools for road safety education was the opportunistic approach (as and when the opportunity arises) followed by inclusion in assemblies. Road safety as a separate topic was also an approach used in four of the experimental schools. Cycling Proficiency was provided for children in the upper years. Two schools, one experimental and one control, stated that road safety was taught in a cross-curricular way and integrated within other topics.

Teachers claimed to be the providers of road safety education in all the schools, usually supported by the Road Safety Officer or the Police. Resources are mainly provided by the RSO and sometimes the Police. Three schools (one experimental and two control) also purchased their own resources. Three control schools and five experimental schools said that the staff had received some in-service training in the past.

The teachers in the experimental schools who were participating in the project were also asked to complete a questionnaire on their attitudes towards road safety education. From this it became clear that teachers did feel that it was part of their job to teach road safety. There was agreement that road safety for this age group can be taught in the classroom as well as on the roads. They did not blame the driver alone for road accidents to children. The majority also stated that road safety did not have to be taught as a separate subject.

7.3.1 The response from the teachers

A secondary aim of the main study was to evaluate the resource in terms of its acceptability and value as perceived by the teachers. During the experimental stage of the project the majority of teachers used the materials to support a specific road safety project, with only two using it as part of another topic and two more including the activities as part of personal and social education.

It was unrealistic to expect teachers to cover everything in the resource within the short time available for a research project. The whole package is designed for use with children from ages 7 to 11 and its use by teachers would form part of whole school curriculum planning.

This was apparent in the teachers' response to the question on how the materials would be used if they were not using the resource as part of a research project. All stated that it would be integrated into the curriculum in some way, usually as part of topic planning. The topics into which use of the resource could be integrated by the teachers varied, and this indicates how important it is to schools to plan their programmes as each has a different approach. In addition, it was also felt that it could be used for reference.

The range of approaches offered and the flexibility that the resource provided which allowed teachers to choose, adapt and add to their existing curriculum proved to be extremely acceptable, as it "provides opportunity for teachers to dip into and use in a cross-curricular way".

As part of the evaluation, the teachers were asked to score and comment upon each element of the resource that they had used. A score of 1 was *good* and a score of 3 was *poor*. The *Notes for Teachers* were marked on three criteria (Presentation, Information and Ease of Use). All other parts of the resource were marked on five criteria (Idea, Presentation, Road Safety Message, Support to Curriculum Work, and Response from Children). In addition, the *Big Book* was judged on Language Used.

Overall, the scores (Table 7.6) and comments made on the material were extremely positive, with the *Interactive Poster* being particularly well received. The most frequent score for each element of the resource was 1 (good) except for *Notes for Teachers* where it was 2 *(satisfactory)*. There were some difficulties with the *Street Sounds Tape* because of the poor sound quality. As one teacher noted "Not very clearly presented, although the idea itself is good".

Table 7.6
Teachers' evaluation of the resource

Complete Resource	Score 1	Score 2	Score 3	Total
Notes for Teachers	21	24	1	46
The Big Book	52	43	5	100
Traffic Sounds Tape	32	29	16	77
Interactive Poster	38	23	5	66
Stimulus Sheets	264	223	50	537
Total	**407**	**342**	**77**	**826**
Percentage	49	41	9	

Notes for Teachers				
No. of teachers x 3 items = 66	21	24	1	46
Voids = 20				
Percentage	46	52	2	

The Big Book				
No. of teachers x 6 items = 132	52	43	5	100
Voids = 32				
Percentage	52	43	5	

Street Sounds Tape				
No. of teachers x 5 items = 110	32	29	16	77
Voids = 33				
Percentage	42	38	21	

Interactive Poster				
No. of teachers x 5 items = 110	38	23	5	66
Voids = 44				
Percentage	58	35	8	

Stimulus Sheets				
No. of teachers x 5 items = 565	264	223	50	537
Voids = 28				
Percentage	49	42	9	

Chapter 8   Discussion and conclusions

The objectives of the project were:

i   To establish methods of listening to children and their reactions to a range of road environments and situations.

ii   To develop a road safety education resource for use in primary schools by teachers.

iii   To evaluate use of the resource with both children and teachers in primary schools in England, Scotland and Wales.

iv   To survey the target age group on their travel patterns to school and their general road use.

8.1 A child-based approach

From the outset the project began with the commitment of involving the children in the development of the resource. The viewpoint of the children was of equal importance to that of the experts in road safety, and critical to the approach used in both the resource and the evaluative measures.

The process of listening to children was intended to be the starting point for devising the resource but it also became important in the design of the evaluation measures. With hindsight this may seem an obvious approach. Certainly, the method had been used by those working in Health Education. However, the concept of listening and discussing with children their particular problems and view of the road environment has not been part of any previous road safety research project.

In this respect, the undertaking has produced far more than an evaluated resource. The resource was a central part of the project but, in addition, evaluation measures have been devised that can be used by road safety practitioners and have added to our understanding of children's use of the roads. The outcomes, therefore, are practical and have utility beyond the completion of the research.

8.1.1   Personal responsibility

Hillman et al. (1990) highlighted the increasing restrictions on children's mobility and speculated on the effect that it may have on the development of children's independence and initiative. Certainly, when listening to children it became apparent that their responses on how to keep safe often involved the intervention of an adult – usually the skills of the engineer to build a safer crossing place. Only when prompted, did some of the children taking part in the discussions comment on what they thought they could do to make a situation safer. Whether that was because of a lack of independent use of the road or the fact that they are rarely asked for an opinion on such issues is not clear.

It may also be related to the traditional messages received by children on how to cope with traffic. Road safety education measures have very often been concerned with highlighting the dangers of roads (quite logically, it may be argued), and being given negative messages on how to cope with using the road. When listening to children, it became obvious that the majority of road safety messages given to children by their parents began with the word *don't.*

The *Use of the Road* data showed that, with increasing age, children are allowed greater independence to use the roads without being accompanied by an adult. However, the girls are not given the same degree of freedom as boys and are more likely to be supervised. However, in the first years after transfer to secondary school the number of children killed and seriously injured rises which indicates that the skills of being able to 'read the road' have not been learned, or that, responsible decisions are not being made.

The results of pedestrian training research with young children (5-7) are indicating beneficial results. This approach allows the children to learn about the road environment under guidance and is a move away from the *don't* messages of road safety. It is a positive technique which is not about scaring children into not using the roads, but at the same time providing early skills training.

Learning to keep safe is about more than learning skills, the discussions with children in the early stages of this project showed that children looked at safety in the environment from a wider perspective than just roads. Whether their fears are misplaced or not is not really the point, their concerns must still be taken into consideration. Essentially, safe road usage is about making decisions, choosing to keep safe as well as deciding upon a strategy to cope with the circumstances that exist.

8.2
Evaluation

There were basically two processes of evaluation. One was concerned with the organisation and presentation of the resource so that it was acceptable for use in schools by teachers. The other was to evaluate the effect of the resource on children. Throughout the project the two evaluations were kept separate. The evaluation from the teachers was concerned with how well the resource worked and its general acceptability. As far as the children were concerned, the aim was to evaluate the effect of the teaching upon children's knowledge and understanding of, and attitudes towards road safety issues.

8.2.1 The resource

Central to the design of the resource was encouraging the children to ask questions and develop their understanding of the changing nature of the road environment. It did not concentrate on scare tactics by trying to turn statistics into horror stories, but looked at the road environment in terms of what strategies can be devised/developed and encouraged a decision making approach. In that way it was intended to build on the child's perception and their growing experience so that they are encouraged to weigh up situations for themselves and not be reliant on reciting a code.

All learners (both adult and child) are concerned with making sense of the world around them, by interpreting it in terms of what is already known. The resource does not try to set down rules or a list of *don'ts*, but it does encourage children to answer questions and have an opinion on what safety is about.

The resource makes full use of large photographs of real situations, and the children responded well to the realism of the situations shown. Through discussion, with one another, as much as with the teacher they are able to reach conclusions and have been made aware that a range of responses might be appropriate.

The teachers found the format very acceptable. Different schools, because of both their location and their intake, will have different needs and interests and consequently their priorities will vary. The resource is flexible and allowed teachers to 'dip into' and develop a safety programme which is appropriate for their circumstances.

Equally important, because of the nature of the resource, teachers are encouraged to listen to children and their perceptions of the road environment. This is a distinctly different technique to that traditionally used to teach road safety. The most difficult concept for teachers to grasp is that there is not necessarily a distinct right and wrong answer, but a range of possibilities along the safety continuum. For example, when visiting a school to conduct the second post test a teacher asked for the right answer to a particular question in the *Big Book*. He went on to explain that the class were divided on the best route to take and had quite a heated debate on the issue. Apparently, the class finally decided that it depended on the circumstances at the time and discussed the type of things that could happen that would affect the safety of taking one route in favour of another.

Discussion and conclusions

The format of the resource allowed children to be involved; the discussions generated invariably brought in difficulties experienced in local situations. Any resource can only be a starting point, or springboard, it can never be the ultimate answer. Road safety is more than education, there are social, cultural and political issues which all contribute to the safety of children using the roads. Road safety education, is therefore, part of a wider picture and, as well as providing children with strategies to cope, it is about enabling them to evaluate situations and respond.

8.2.2 The children

The problems of evaluating road safety education and training were discussed earlier (see Chapter 5). It is worth restating at the outset that the present evaluation, in common with all previous evaluations of such initiatives, did not attempt to demonstrate any reduction in the number or rate of road accidents incurred by the children taking part. In common with other studies, it attempted to determine whether the teaching of the resource resulted in an increased level of knowledge and a change in attitudes. In previous training initiatives, the evaluation has generally been in terms of the ability to cross the road safely or to plot a safer route on a map or model.

In the present study, the evaluation was largely in terms of the children's ability to determine safer strategies in a variety of situations depicted in colour photographs. The technique proved motivating to the children and they immediately related to the situations shown. Many of them said that they knew the particular localities although, in reality, the photographs were taken many miles away from the school. This result is important as it tends to negate the argument of those proponents of road safety training who maintain that classroom teaching is irrelevant. The use of realistic colour photographs was probably critical to its success. Much of the graphics used in educational materials has tended to be of an idealised middle-class environment to which the children in this study would be unlikely to relate.

The decision to undertake the main evaluation in nine schools and 23 classes complicated the evaluation in that the effect of the teacher and his/her style of teaching could not be totally controlled. Inevitably, the amount of time spent on teaching the experimental group, the emphasis placed upon the various topics in the resource, as well as the particular style of teaching will vary between teachers and all these variables will tend to affect the children's performance. Such uncontrolled variations will tend to reduce the likelihood of overall significant effects being detected.

The use of two post-tests is comparatively rare in evaluations of this type. Yet it is extremely important to determine if any apparent effect lasts longer than a few weeks. Scores on the second post-test tend to be affected by more extraneous factors, particularly in this age group where the rate of maturation is comparatively high.

The results suggested that, in both post-tests, the children in the experimental group performed significantly better than those in the control group. The statistical technique controlled for variations in the initial levels of knowledge. It would appear therefore, that the effect of the teaching of the resource lasted for at least several months and was not confined to the period immediately following the teaching.

The results of the *Thinking about Roads* tests were more equivocal. After post-test 1, there was some indication of an increased awareness of personal responsibility for one's own safety. At post-test 2, significant differences were found for both the control and experimental groups. A possible explanation is that, for many children, it was the first time they had been asked for their opinion of road safety issues. They may well have had no attitudes towards these issues prior to this study and the repeated administration of the test may have covered the period during which such attitudes were gradually taking shape.

8.3
Using the roads

The use of the roads survey was devised to provide background information to the project, but in itself has resulted in important data. The sample size of over 1,100 children in the 8-11 age group has resulted in data on how children travel to and from school, the frequency of playing outside without an adult and the relationship between bike ownership and cycle helmet wearing.

Hillman *et al.* (1990) in his comparison of the independent mobility of children in England and Germany concluded that the increase in car ownership has been gained at the cost of a loss of freedom and choice for children. The personal freedom, in terms of journeys made unaccompanied by adults, of young children had been curtailed within the last twenty years and Hillman *et al.* suggests that it is predominately the increase in traffic that has been responsible for the decrease in children's independence.

The road use survey in this project was completed by children only (unlike the Hillman *et al.* study which also involved parents and headteachers). The survey was not intended to be a major element of this project, but to provide information to the project team. In addition, the data collected can be used in the notes for teachers as part of the resource.

However, there are some similarities in the results of the two studies. As might be expected, with increasing age children are more likely to walk to and from school unaccompanied by an adult. In both studies it was found that there was a high level of bike ownership. However, it was found that the use of a bike decreased with age, rather than increased. This may be due to parental concern of children using their bikes on the road, especially as, with increasing age children are more likely to want to travel further away from home. At the upper end of primary school, the bike may become less of a toy and more of a means of transport, so that the children reported less use of their bikes simply because they no longer 'played out' on most days. It may also be that the children feel that their bike is no longer suitable and that unless they have a cycle with 'street credibility' they are less likely to want to be seen playing on it.

Around 40% (this includes children walking with friends and siblings) of the children aged 7-8 reported that they walked to school unaccompanied by adults, whereas, the Hillman *et al.* study it was recorded at around 20% of seven and eight year olds walked to school unaccompanied. However, he did note that younger children claimed a greater degree of independent travel than that stated by their parents. Whether the children in this study were simply boasting is unknown, but even allowing for that possibility, there is still a marked difference. The percentage of children being taken to school by car was only around 20% for children aged 7-9 years and decreased to around 15% for children aged 9-10 years.

One possible reason for the differences between the results of the present study and the Hillman *et al.* study may lie in differences in the social class distribution of the two samples. Hillman *et al.* reported that 46% of responding junior school parents were from social classes I and II (Hillman *et al.*, 1990 Table 44). As mentioned earlier (Section 6.1.1), the present study was undertaken in schools with council estates as their main catchment areas.

In terms of using the streets as a playground, around 40% of 7-11 year olds stated that they played out in the street most days, and around 34% played out sometimes. These figures do not indicate that children are being excessively restricted by adults in their use of the road environment. However, it must be remembered that the children completed the *Using the Roads* questionnaire during the summer term. Unfortunately, the scope of this project did not allow for further investigation of where children played and what restrictions and rules were applied by adults.

The *Using the Roads* questionnaire was quickly and easily completed by all age groups taking part in the project. It could easily be used by other road safety practitioners to obtain local data. Teachers in schools also expressed interest in using the sheets as part of a data

handling exercise. This would encourage both teachers and children to consider and discuss the children's use of the road and open up the debate of the nature of the road environment to the children themselves. The children are not only road users now, but they will also be the decision makers of the future and will help shape the road environment of the next century.

8.4 Promoting road safety education in schools

Schools have no statutory requirement to teach road safety as a specific subject but in each of the national curriculums of the countries of the United Kingdom there is a commitment to preparing children for life. As such, there is scope for road safety to form part of every child's education as the aims of road safety support the aims of the whole curriculum, but it is necessary for the opportunities to include road safety to be identified.

Each of the national curriculums, although different in terms of the language used and the specific requirements, does not prescribe any single approach to planning and delivering the curriculum. It is recognised that there are many valid and effective ways of approaching the teaching task. The response from teachers who participated in this project highlighted the need for teachers to be involved in developing a planned and progressive programme for road safety education.

The comments made by the teachers showed that the resource is something which they could use as part of that planning. The flexibility, or 'dip-ability' as it has been termed, of the resource allows teachers to provide road safety education specifically for their pupils. It takes into account that circumstances will not remain static for the children, teachers, schools, or indeed the built environment around them. The lifestyles of the children will change and new problems, issues and concerns will arise.

The resource cannot work in isolation. The promotion of road safety education and the heightening of awareness and understanding of teachers is also of importance. The development of a new resource, albeit a thoroughly evaluated package, is only one small element of a bigger picture. However, all teachers need resources and if good quality and attractive road safety resources can be produced that meet both educational and safety objectives, then it is more likely to be acceptable to schools, teachers, children and parents.

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Chapter 10 Acknowledgements

Appendix A: Guidance notes for the exploratory discussions

Purpose of the discussions

The main purpose of the discussions is to discover what children perceive as hazards on the road and the strategies that they use to cope with these risky situations.

Interviewers will seek to explore:

   if this perception changes when they are with an adult;
   the reasons they feel safe or unsafe in different road environments and road usage circumstances;
   who they think is responsible for keeping them safe when they use the roads;
   the road safety messages they are given by adults.

Numbers of children

The discussions are to be conducted on a group and individual basis. The groups are to be no larger than four. Where possible an observer should also be used for the group discussions. The children's responses will be recorded.

Teacher explanation to children

You have been chosen to take part in a study which is concerned with finding out about how to prevent road accidents. You will be asked to take part in some activities and say what you think about the roads.

General introduction

Hello. Thank you for helping me with my work. My name is .... and working with me today is .... (if the RSO or someone else is present). He/she here to learn about my work and will be watching us today. Today I want you to think about keeping safe when you use the roads.

There are three activities I would like you to do, each one will be explained carefully.

I'm sure that you will enjoy the activities, especially as there are no right or wrong answers.

Do not mention dangerous places, or dangerous road behaviour which may give the children a lead.

If the children ask questions, it is important that you do not respond with advice or information which may colour their responses.

Technique 1
Response to an aural stimulus

Description

Using sound to enable each child to picture places with which they are familiar in response to listening to traffic situations.

Responses are first recorded individually by children drawing and/or writing about their situation. A verbal response is then given by the children prompted by stimulus questions. The responses will be recorded on tape.

On the tape are a series of different recordings – 1. Busy single carriageway, near a bus stop on a Saturday afternoon. 2. A suburban shopping centre near a busy single carriageway road on a Saturday afternoon. 3. Sound collections, a bus reversing, a bicycle bell, a warning siren, children's voices, child skipping. *

Equipment required

4 personal cassette players with batteries

4 cassettes of traffic noises

spare batteries

box of pens, pencils, coloured pencils, felt-tip pens, rubber

folder containing blank sheets of white paper with labels to complete. Each sheet of paper must have the **school, male/female, age in years, School Year ie 4,5,6, the date.**

plastic folder with school information sheet to keep the children's written and drawn responses, labelled with school name, number of pupils from Yr 5 and Yr 6, date

cassette player and blank labelled tape for recording group discussions

Name badges for the children?

Instruction sheet for interview strategy using an aural stimulus

Approximate timing

introduction... 3

listening to tape... 3

drawing...10/15

discussion...10/15

TOTAL IN MINUTES .... <u>36</u>

Preparation

Listening to the tape.

Set up the cassette to record the group discussion.

Put the box of pens, and sheets of paper in easy reach of all children

Spoken instructions to children before listening to the tape

You will be listening to a tape of traffic sounds. Close your eyes while listening to the tape, picture the scenes that you are hearing in your mind. You each have your own tape.

After you have listened to the tape I would like you to draw what you have heard. It does not have to be a complete picture and can be several pictures. Please write on your drawing. Draw yourself in your picture and include other people.

If you want me to write for you or help you with spellings, whisper what you want to say to me.

Both sides of the paper can be used.

Stimulus questions for discussion

How safe do you feel in your picture?

What do you need to keep safe from?

How do you keep yourself safe?

How do other people keep you safe when using the roads?

What makes you feel unsafe?

What do grown-ups say to you about keeping safe?

Technique 2 response to a questionnaire

Description

The questionnaire consists of 30 questions which are to be completed individually by the children. There should be no general discussion.

Equipment Required

Enough questionnaires for each child

Spare pencils

Plastic holder labelled with name of school, number of children from Yr 5 taking part, number of children from Yr 6 taking part.

Preparation

Reading through the questions.

Instruction sheet for questionnaire completion

	Approximate timing
introduction and explanation	5
questionnaire completion	10
TOTAL IN MINUTES	<u>15</u>

Spoken Instructions to Children before the Questionnaire is Completed

The sentences on the sheet are about keeping safe when using the roads. Each comment will be read out loud to you. Beside each comment are three boxes. You have to tick which one to show what you feel about the sentences.

Questionnaire

Please put a tick in one of the boxes to answer.

Where I feel safe	Agree	Not sure	Do not agree	Can't say
1 The roads outside my house are safe.				
2 I don't feel safe playing in the street outside my house.				
3 I know where to find a safe place to cross.				
4 I feel safe on quiet country roads.				
5 I don't know how to cross the roads where there are parked cars.				
6 I am more careful on roads that I don't know very well.				
7 My garden is a safe place to play.				
8 I like it when I'm in a car and it is going fast.				
9 I feel safer in a car than when I'm walking.				
10 I like wearing a cycle helmet.				
11 If I can't see any cars, it is safe to cross the road.				
12 I find it difficult to look behind me for traffic when I'm cycling and I need to turn right.				

Grown-ups say this to me	Agree	Not sure	Do not agree	Can't say
13 Be careful.				
14 Stop at the kerb.				
15 Can you tell how fast the cars are going?				
16 Listen for traffic.				
17 Don't ride your bike in the road.				
18 Wear your cycle helmet.				
19 Are you wearing your seat belt?				
20 Do you know why drivers cannot stop suddenly?				
21 I'll show you how to use a pelican crossing?				

Grown-ups do this	Agree	Not sure	Do not agree	Can't say
22 Cross the road at a pelican crossing when the red man is showing.				
23 Cross to the middle of the road and wait for traffic to go past before crossing to the other side.				
24 Go out on my bike with me to teach me how to ride on the roads.				
25 Run across the road to get through a gap in the traffic.				
26 Hold my hand when I'm walking with them.				
27 Explain where it is safe to cross the road.				
28 Drive faster so that we don't have to stop at the traffic lights.				

Technique 3
Response to a
visual stimulus

Description

12 Photographs of a variety of road situations. Children are asked to comment verbally following stimulus discussion points. The verbal comments are recorded on Post-It Notes so that the children can refer back to the comments.

Equipment Required

12 photographs laid out on the desk

Blank sheet of paper, Post-It notes, felt tip pen

Cassette recorder and blank tape – Date, time, school etc recorded at the beginning and labelled.

Preparation

Look at photographs.

Set up cassette and recorder for responses. Cassette labelled with school, date, number, sex, age of pupils.

Have sheets of paper by the photographs ready for the Post-It notes to be stuck on, in a position where it can be seen easily by the children.

INSTRUCTION SHEET FOR INTERVIEW STRATEGY USING A VISUAL STIMULUS

Approximate timing

introduction and explanation.. 3

discussion on photographs 15/20

TOTAL IN MINUTES.. <u>23</u>

Spoken Instructions to the children before the discussion

Before we start talking about this activity, there are some basic rules that have to be followed. They are called 'brainstorming rules'. They are:

1 Everyone's ideas are important;

2 You are not allowed to speak while someone else is speaking;

3 You cannot say what you think about another person's idea.

Each comment that you make about a photograph will be written on a Post-It note. (approx 5 minutes)

Stimulus Questions for the Photographs

Describe what you can see.

What are the people doing to keep safe?

How could the people in the photographs make themselves safer?

Which roads would you feel most safe using? Why?

Which roads would you not feel safe using? Why?

General Discussion

Similar ideas can then be grouped together by moving the Post-It notes and a general discussion about road situations can take place.

Closing the Activity

Thank you very much for all your help. You have helped me a great deal.

School _____ Interview Date _____

Activity _____

Pupils _____ School Year _____ Sex_____Age in Years_____

1_____

2_____

3_____

4_____

OBSERVERS CHECKLIST
Who's Doing the Talking?

First Name	Number of Contributions (Tally in 5s)	Total

Road Safety Comments

Please mark each time comments were made about the following.

Worries about using the roads	
Descriptions of how situations are coped with	
Adults poor road behaviour	
Attributing blame to other road users	
Taking personal responsibility	
Other	

Describing the Group

Please place a tick by the words that best describe the group behaviour.

Formal	_____	Informal	_____
Competitive	_____	Cooperative	_____
Hostile	_____	Supportive	_____
Inhibited	_____	Open	_____

Appendix B   Using the roads

Name: . . . .   Year : . . . .

Boy ☐   Girl ☐

Please tick one box for each question. There are no right or wrong answers.

1   Usually when I come to school -

I walk by myself . . . . ☐
I walk with friends . . . . ☐
I walk with younger brothers and sisters . . . . . . ☐
I walk with older brothers and sisters . . . . ☐
My Mum or Dad or another grown-up walks with me ☐
I go by car . . . . ☐
I go by bus . . . . ☐
I ride my bike . . . . ☐

2   Usually when I go home from school -

I walk by myself . . . . ☐
I walk with friends . . . . ☐
I walk with younger brothers and sisters . . . . . . ☐
I walk with older brothers and sisters . . . . ☐
My Mum or Dad or another grown-up walks with me ☐
I go by car . . . . ☐
I go by bus . . . . ☐
I ride my bike . . . . ☐

3   I cross these roads on my own -

No roads . . . . ☐
The nearest road to my house . . . . ☐
All the roads nearby . . . . ☐
All roads . . . . ☐

4   I think that I will be old enough to cross any road safely on my own -

when I am . . . . years old.

If you think that you are old enough now, write down your present age.

5   I play out in the street –

Most days . . . . ☐
Sometimes . . . . ☐
Hardly ever . . . . ☐
Never . . . . ☐

6   I have a bike of my own -

Yes . . . . ☐
No . . . . ☐

7   I ride my bike –

Most days . . . . ☐
Sometimes . . . . ☐
Hardly ever . . . . ☐
I don't have a bike . . . . ☐

8   I usually ride my bike –

Only in my garden, in a park or away from roads . . ☐
On the pavement . . . . ☐
On the road . . . . ☐
I don't have a bike . . . . ☐

9   I have a cycle helmet -

Yes . . . . ☐
No . . . . ☐

10   When I'm riding my bike in the street, I wear my cycle helmet –

Always . . . . ☐
Usually . . . . ☐
Hardly ever . . . . ☐
I don't have a cycle helmet . . . . ☐

11   When I'm in a car, I wear my seat belt -

Always . . . . ☐
Usually . . . . ☐
Hardly ever . . . . ☐
I never go in a car with seat belts . . . . ☐

Name: . . . .   Year : . . . . .

Boy . . . . ☐
Girl . . . . ☐

In this activity, you will be looking at photographs and then answering questions about what you see in them.

For some questions, we will give out a colour photograph. Please do NOT mark these photographs in any way. On other questions, you will find a black and white copy on this sheet. You may be asked to write on this copy.

Photograph 1 - Bend on Rural Road

Look at this photograph. Pretend that you are walking along the road around the bend. On which side of the road should you walk? Tick one box.

a)   On the side by the building? . . . . ☐
b)   On the other side? . . . . ☐

Photograph 2 - Street with Parked Cars

Look at the photograph below. Find the lamppost.

Pretend you are walking along that pavement and want to cross to the other side of the road.

a)   Mark with a X on this photograph where you should stand **BEFORE YOU START TO CROSS** to get a clear view of the cars coming along the road.

b)   You must often be careful that a parked car does not suddenly drive away. What should you look for that might tell you that a parked car is about to move?

Write down your answer here.

. . . .

. . . .

. . . .

Photograph 3 - The Roundabout

Look at the colour photograph and the plan view of the roundabout.
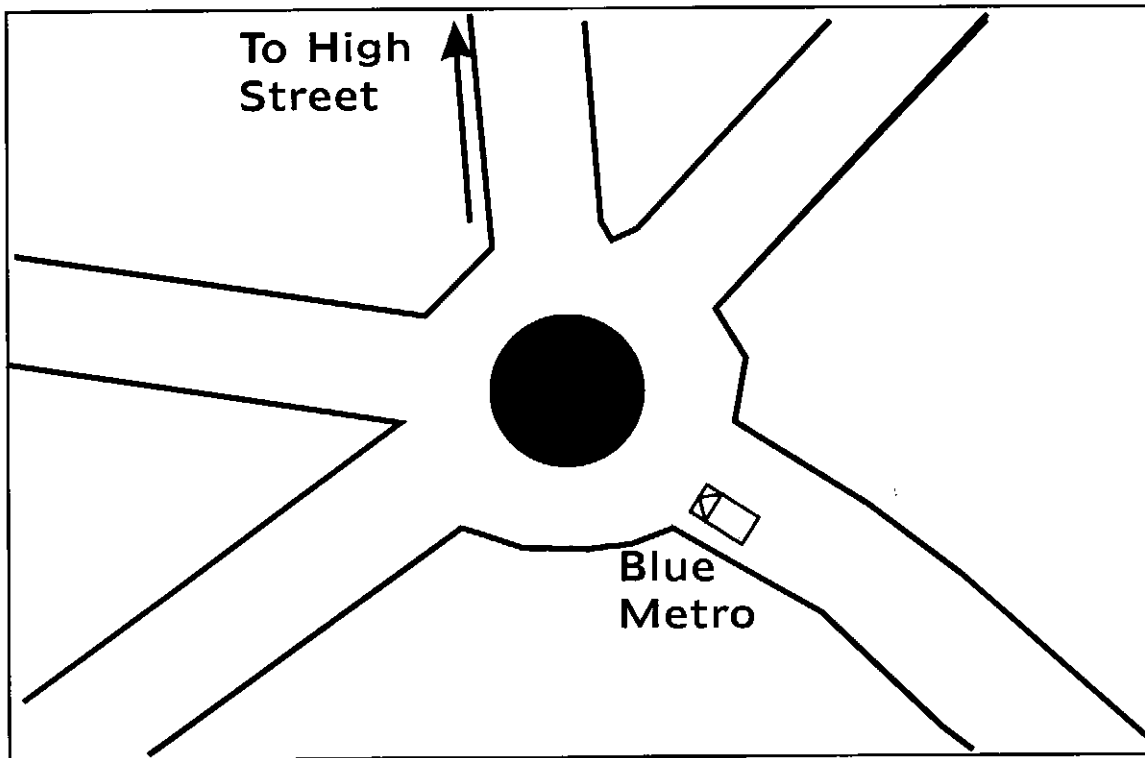
a)   Mark on your plan with a X the position of the black car.

Pretend that you are on your bike behind the blue Metro and that you want to ride down the road towards the High Street.

b)   Draw a line on the plan to show the route you would take from the blue Metro to the High Street.

c)   Would you ride your bike or walk with it to the other side of the roundabout? Tick one box.

I would walk with my bike . . . . ☐
I would ride my bike. . . . . ☐

Photograph 4 - The Pelican Crossing

Look at the colour photograph. Pretend that you have just arrived at the crossing. From what you can see in the photograph -

a) Would you cross the road now?

Yes . . . . □
No . . . . □

b) What colour are the pedestrian lights at the moment?

Red man showing . . . . □
Green man showing . . . . □
Flashing green man showing . . . . □

c) When the traffic lights change, what colour will they show next?

Red   . . . . □
Yellow . . . . □
Green   . . . . □

Photograph 5 - The Pedestrian Refuge

Look at the colour photograph. Find the pedestrian refuge with the man standing on it.

a) If you were riding your bike towards the pedestrian refuge, should you stop to let the man cross the road?

Yes . . . . □
No . . . . □

b) Pedestrian refuges make it easier for people to cross the road because:

you only have to look for traffic from one
direction at a time   . . . . □
the traffic should stop to let you cross the road . . □
the traffic always goes slower there . . . . □

Photograph 6 - The Crossroads

Look at the two cars in the colour photograph.

On the plan below:

a)   mark with arrows ALL the possible directions that the blue car might **go in.**

b)   Pretend you are the pedestrian in the photograph. You want to go to the **TEXACO** garage. Draw a line showing the route you would take.
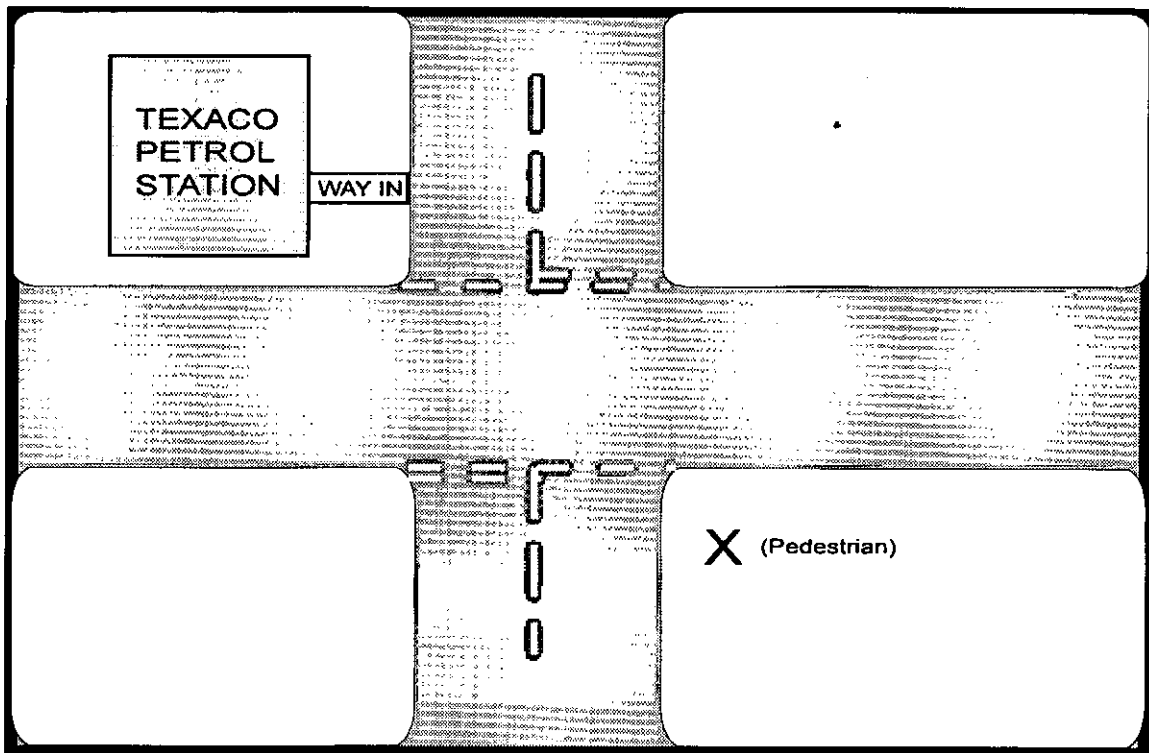
Appendix D   Roads quiz

Name: . . . .   Year: . . . .

Boy ☐   Girl ☐

---

1   Every year, about 50 children die in drowning
     accidents. About how many do you think die in road
     accidents. Circle your answer.

     25   50   150   350   550

---

2   Circle the senses you **must** use to cross the road safely.

     Smelling   Hearing   Seeing   Touching   Tasting
     Nose   Ear   Eye   Skin   Tongue

---

3   Draw lines from the pictures to the correct answers.

| Signs with red circles | Signs with red triangles | Signs with blue rectangles |
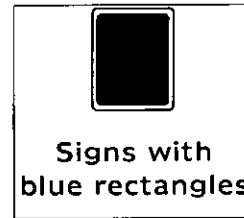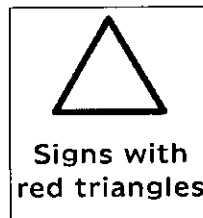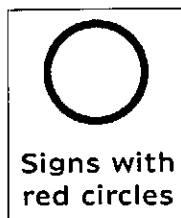
            Give   Give   Give
        information   orders   warnings

---

4   Tick the correct answer.

This sign means -

• Pedestrians in road

• No pedestrians

• Pedestrians only

5 **Look at the room you are sitting in now. How long do you think the room is?**

Write down your answer in metres.

6 **Underline the best answer.**

Guard rails at the edge of the pavement are designed to:

Stop vehicles parking on the pavement.

Stop people crossing the road at dangerous places

Keep animals off the road.

7 **When riding your bike, to turn right safely, you must:**

Signal right

Move to the centre of the road

Look behind

Tick which action you should do first.

Appendix E Thinking about roads

Name: . . . . Year Group: .

Boy ☐ Girl ☐

Please read each of the sentences below. If you agree with the sentence and want to say **YES**, put a circle around the tick(✔). If you do not agree and want to say **NO**, put a circle around the cross (✖). If you are not sure, circle the question mark (**?**).

Don't spend too much time thinking. We would like your first thought. Remember, there are no right or wrong answers. It's your opinion we want.

1 When I'm out with a grown up, it's up to them to make sure I am safe on the road.	✔	✖	?	
2 If there's no traffic near, my friends would laugh at me if I said "Let's wait for the Green Man".	✔	✖	?	I never use pelican crossings.
3 I like being in a car when it's going really fast.	✔	✖	?	
4 I like wearing my cycle helmet.	✔	✖	?	I don't have a cycle helmet.
5 I feel silly holding a grown-up's hand to cross the road.	✔	✖	?	
6 It's OK to cross on the Red Man if there's no traffic near.	✔	✖	?	I never use pelican crossings.

7 It's up to me to make sure that I don't get knocked down by a car.	✔	✗	?	
8 Most drivers drive too fast on the roads I use.	✔	✗	?	
9 Quiet roads are much less dangerous to cross than busy roads.	✔	✗	?	
10 Pedestrians shouldn't cross between parked cars.	✔	✗	?	
11 If I don't look before I cross the road, it'll be my fault if I get run over.	✔	✗	?	
12 I feel safer in a car when I am wearing a seat belt.	✔	✗	?	I never go in a car fitted with seat belts.
13 You have to be a good driver to drive fast.	✔	✗	?	
14 Most accidents involving children crossing the road are the driver's fault.	✔	✗	?	

Figure F.1
Journey to school
by area of Britain

Percentage

By self   With friends   With siblings   With adult   By car   By bus

Glasgow   Sunderland   Walsall   Ch Wood   Rhayader   Barnet   Warminster
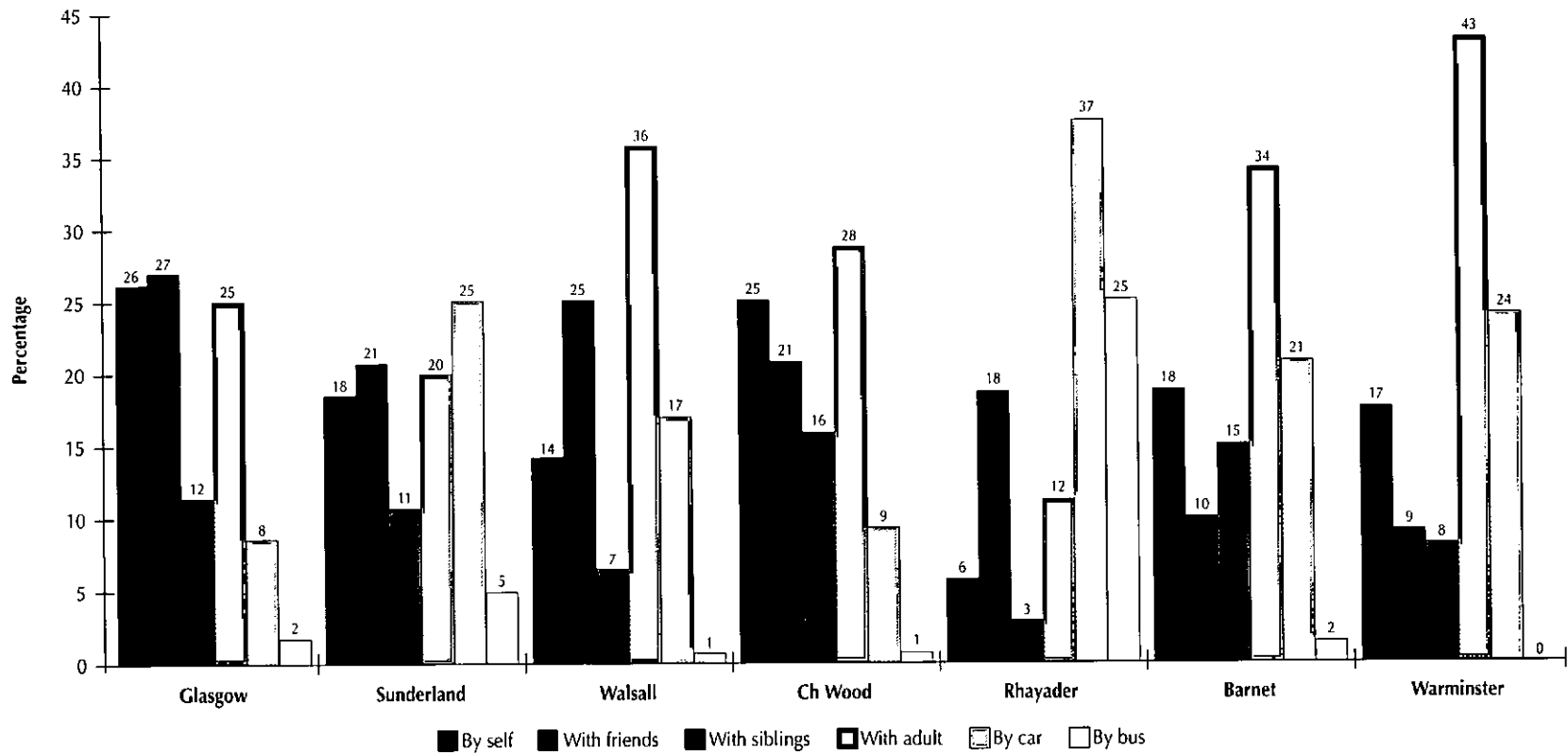
Figure F.2
Journey from school
by area of Britain

Legend: ■ By self ■ With friends ▨ With siblings ▢ With adult ▢ By car ▢ By bus
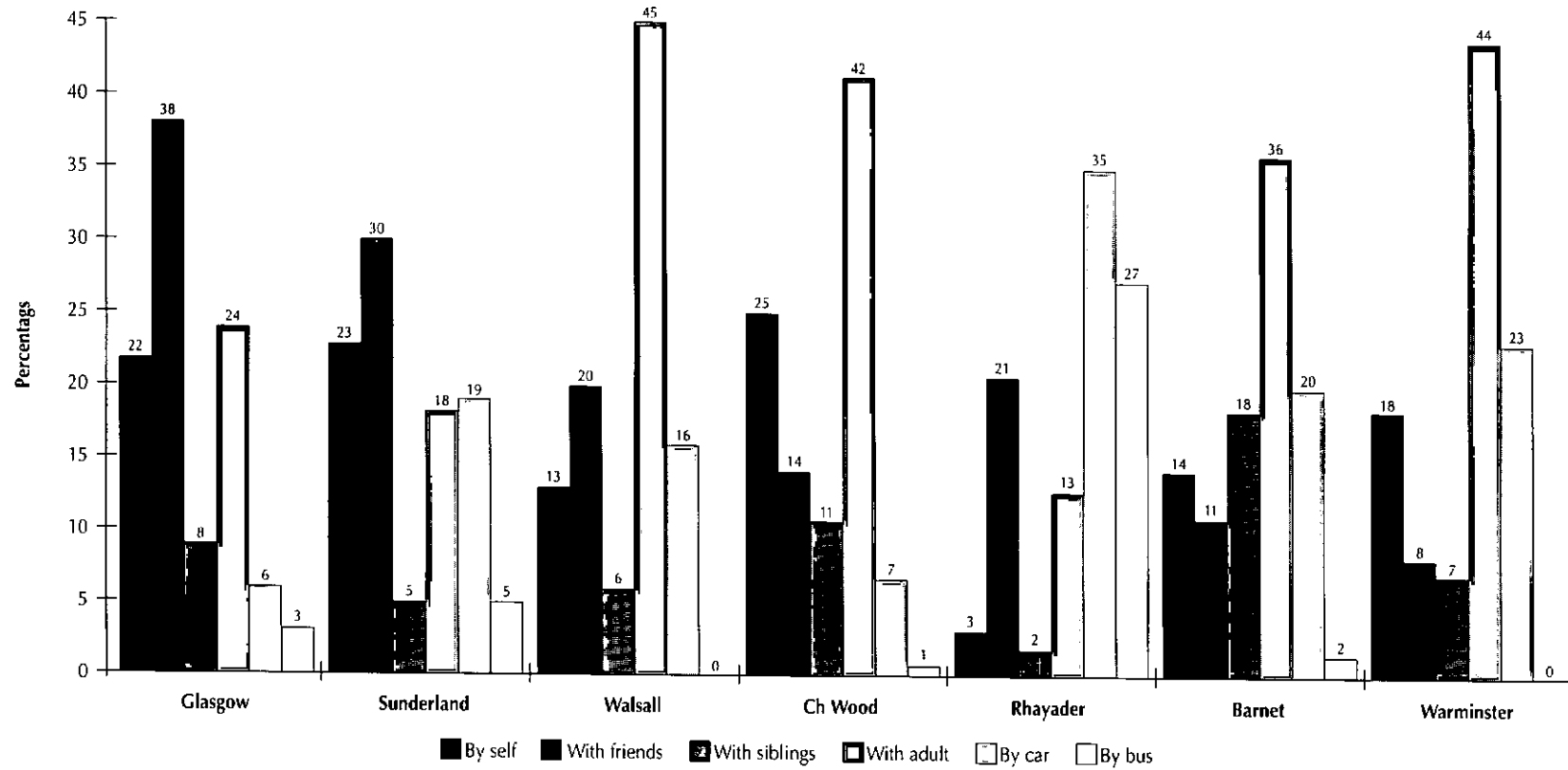
*Figure F.3
Accompanied to
school by area
of Britain*
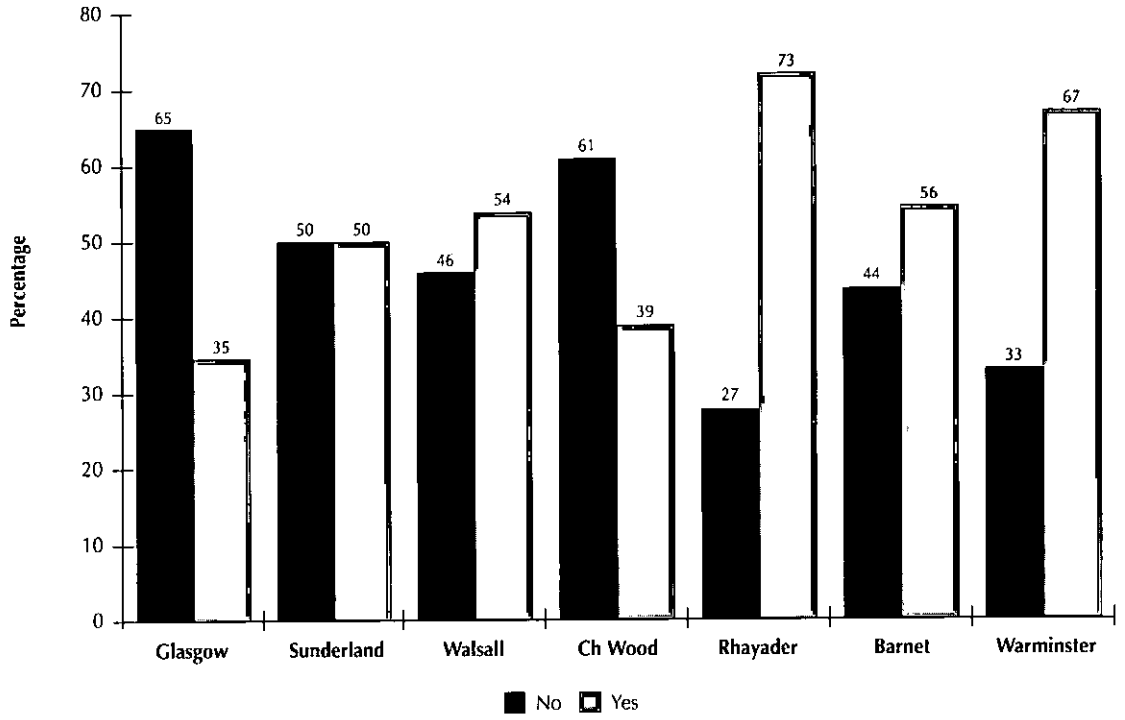
*Figure F.4
Accompanied from
school by area
of Britain*
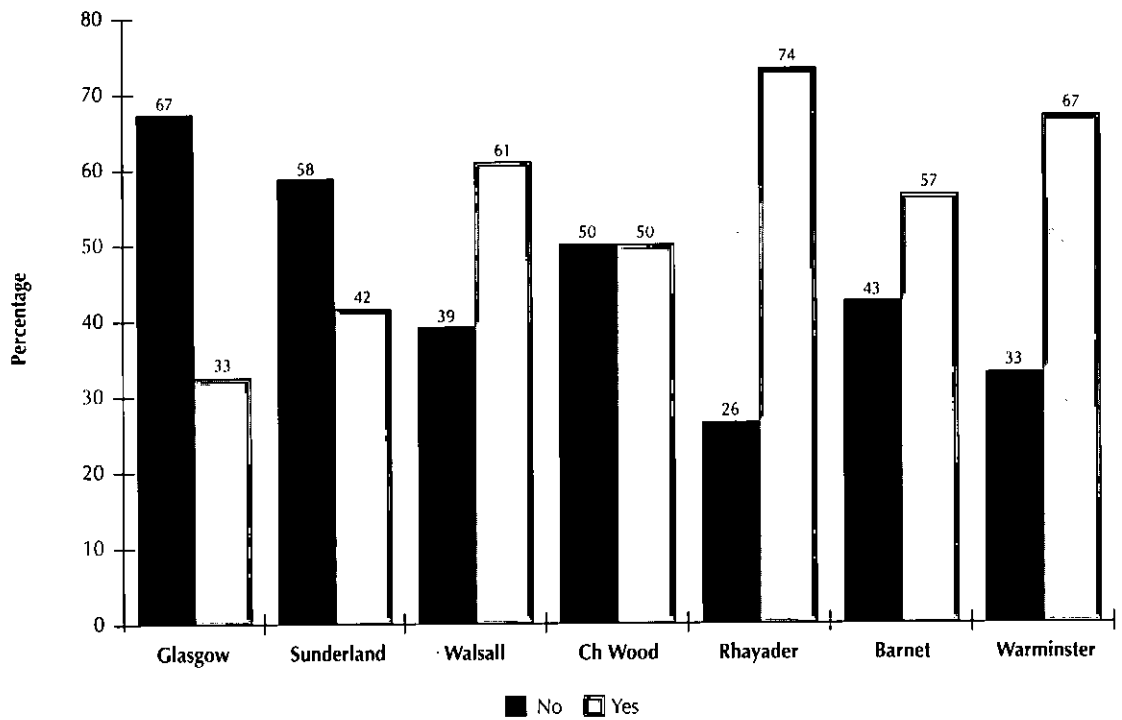
**Figure F.5
'I cross these roads on my own' by area of Britain**

No roads ■   Nearest house ■   All roads nearby □   All roads □
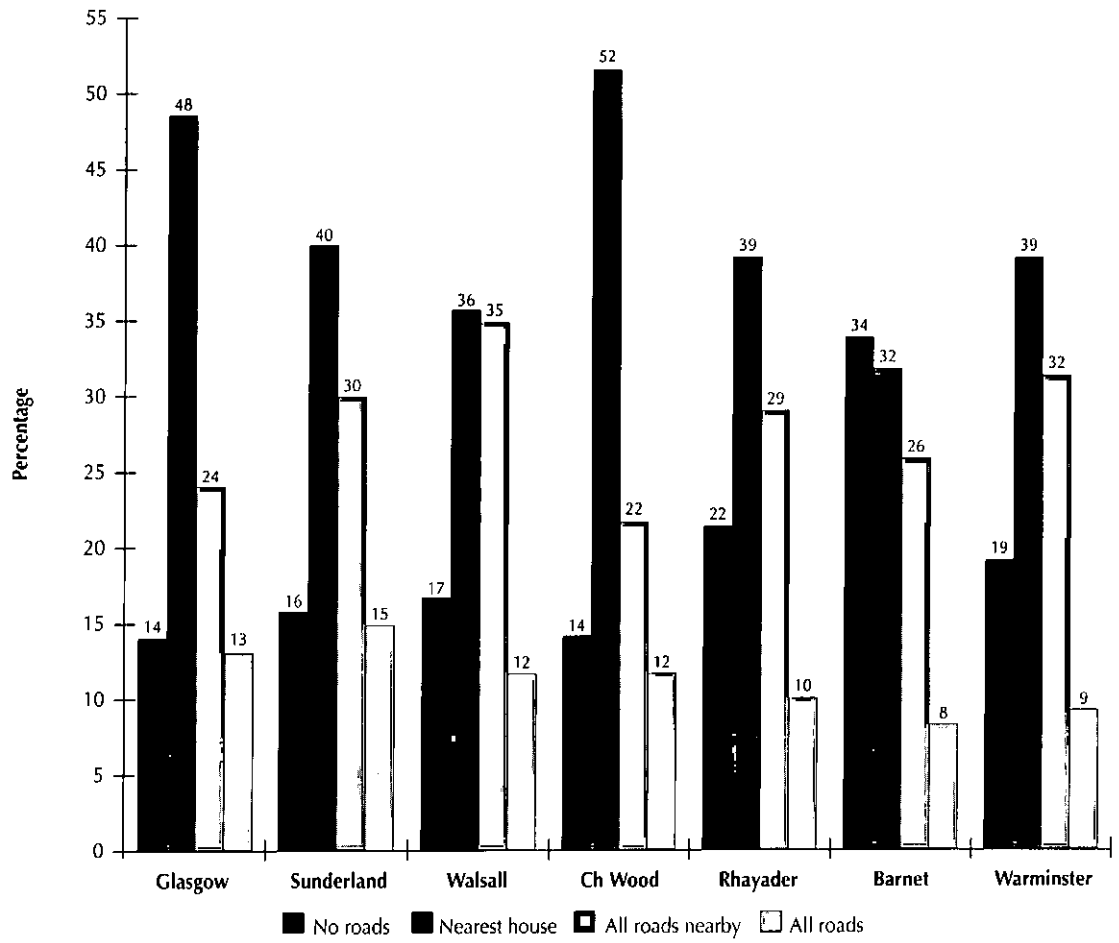
**Figure F.6
Frequency of playing out by area of Britain**
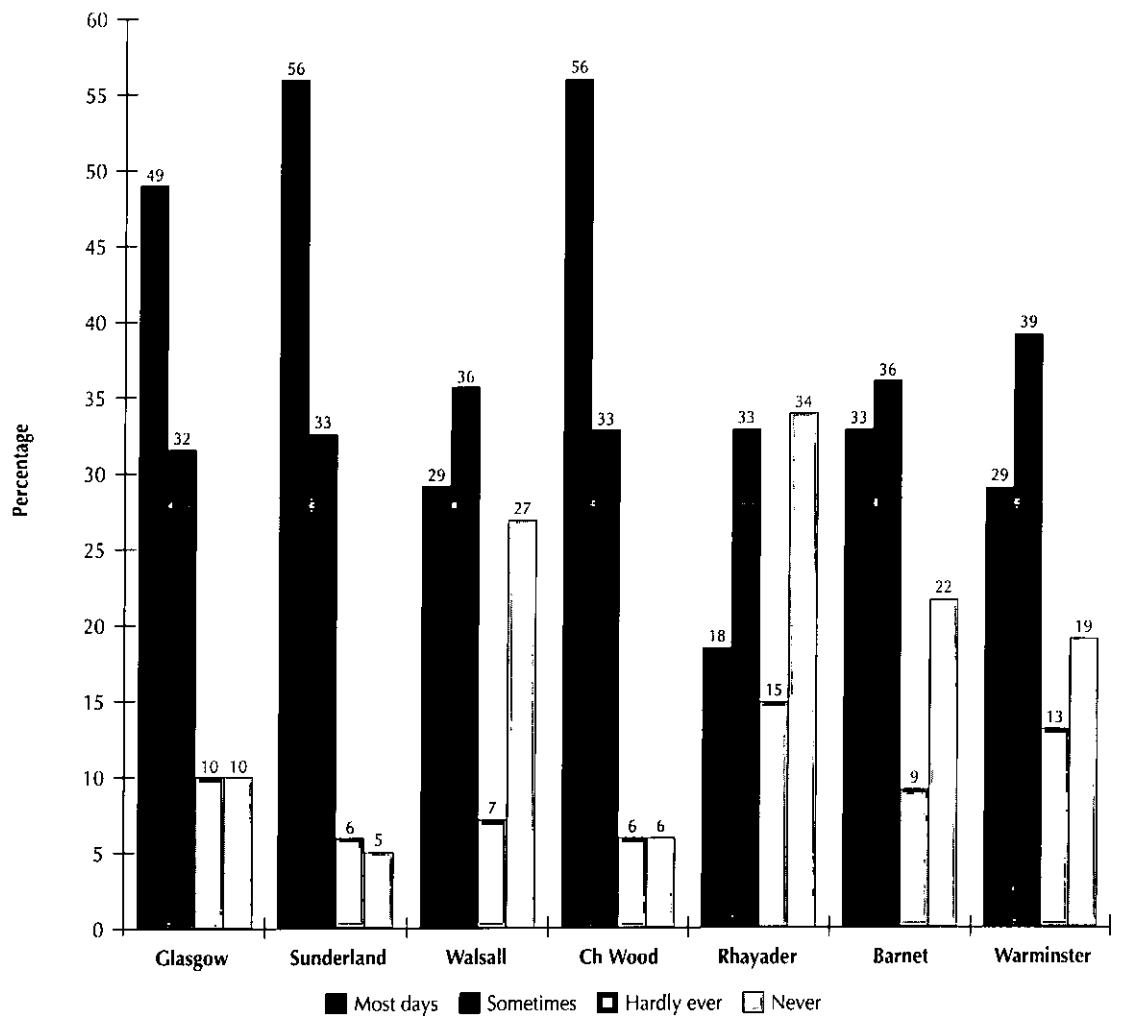
Most days ■   Sometimes ■   Hardly ever □   Never □

**Figure F.7
Bike ownership by
area of Britain**

Figure F.7 Bike ownership by area of Britain

**Figure F.8
Frequency of riding
bike by area of Britain**
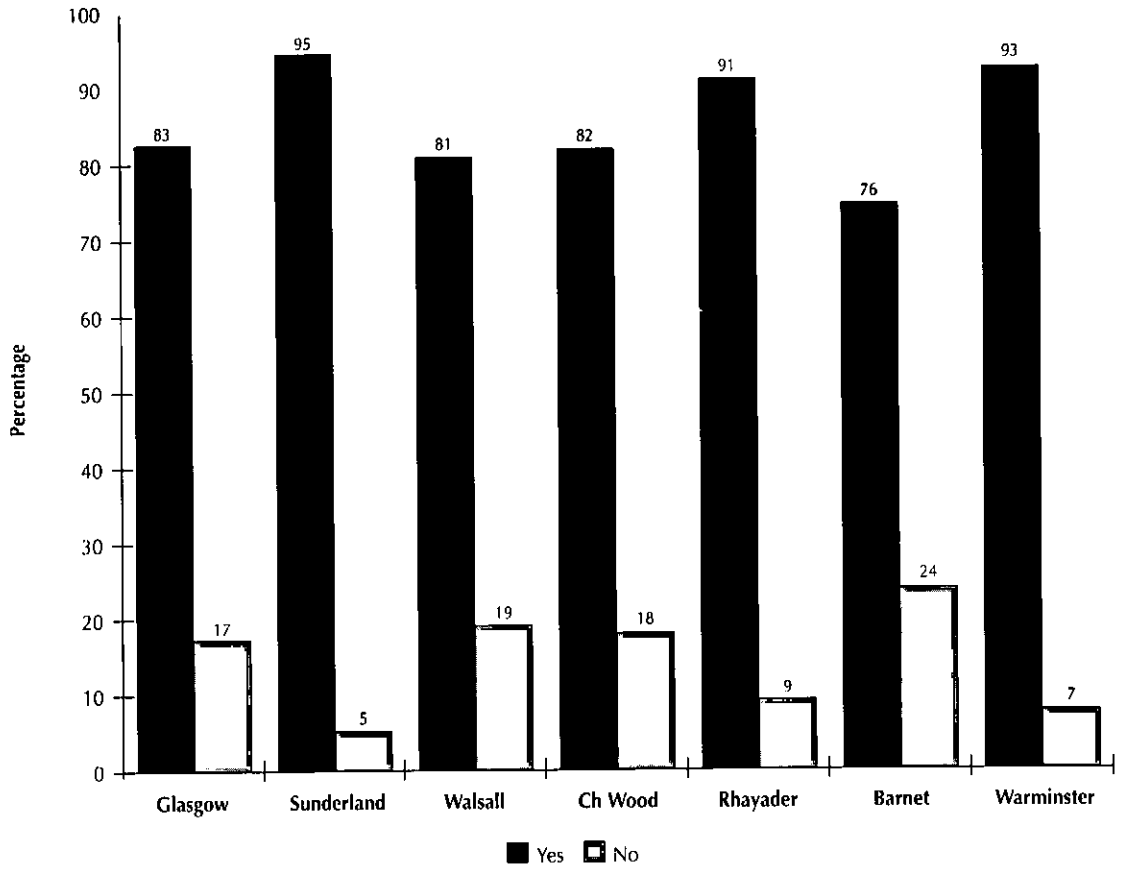
Figure F.8 Frequency of riding bike by area of Britain
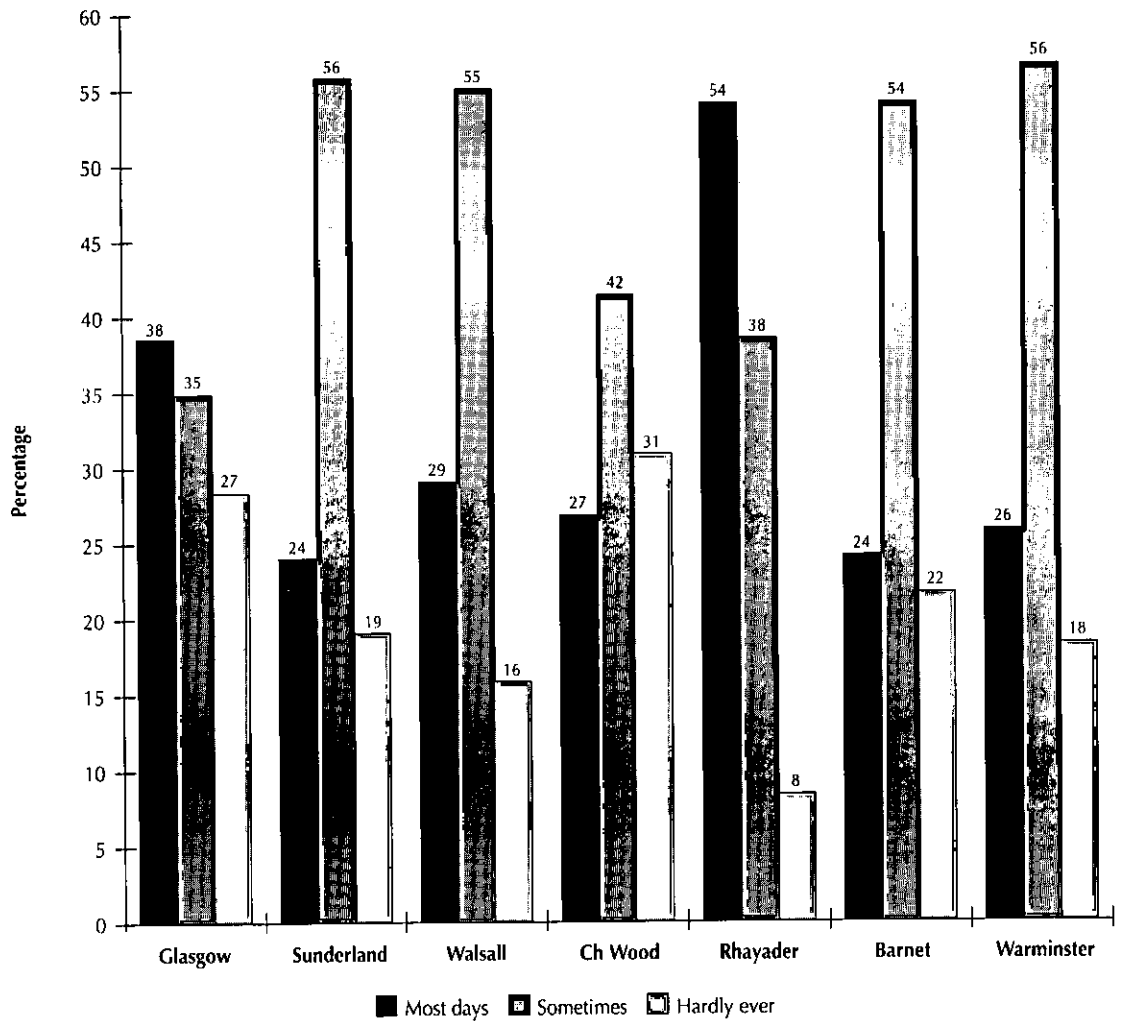
Figure F.9
Location of bike riding by area of Britain
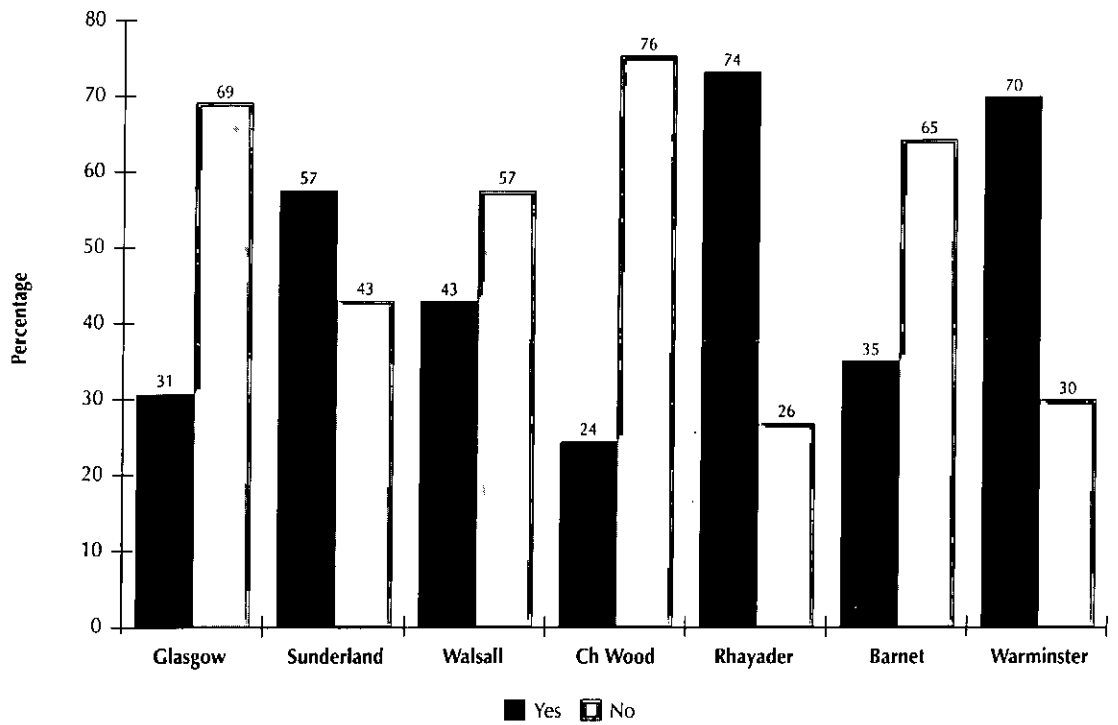

Away from roads ☐ On pavement ▨ On road
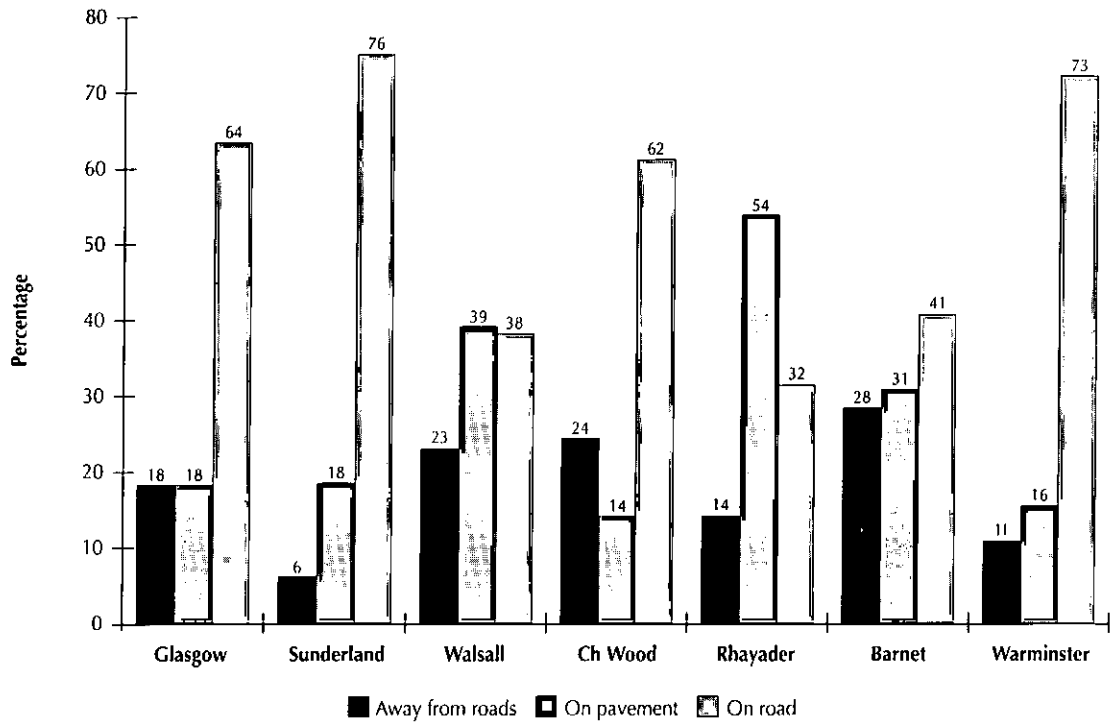
Figure F.10
Cycle helmet ownership by area of Britain (bike owners only)

■ Yes ☐ No

Figure F.11
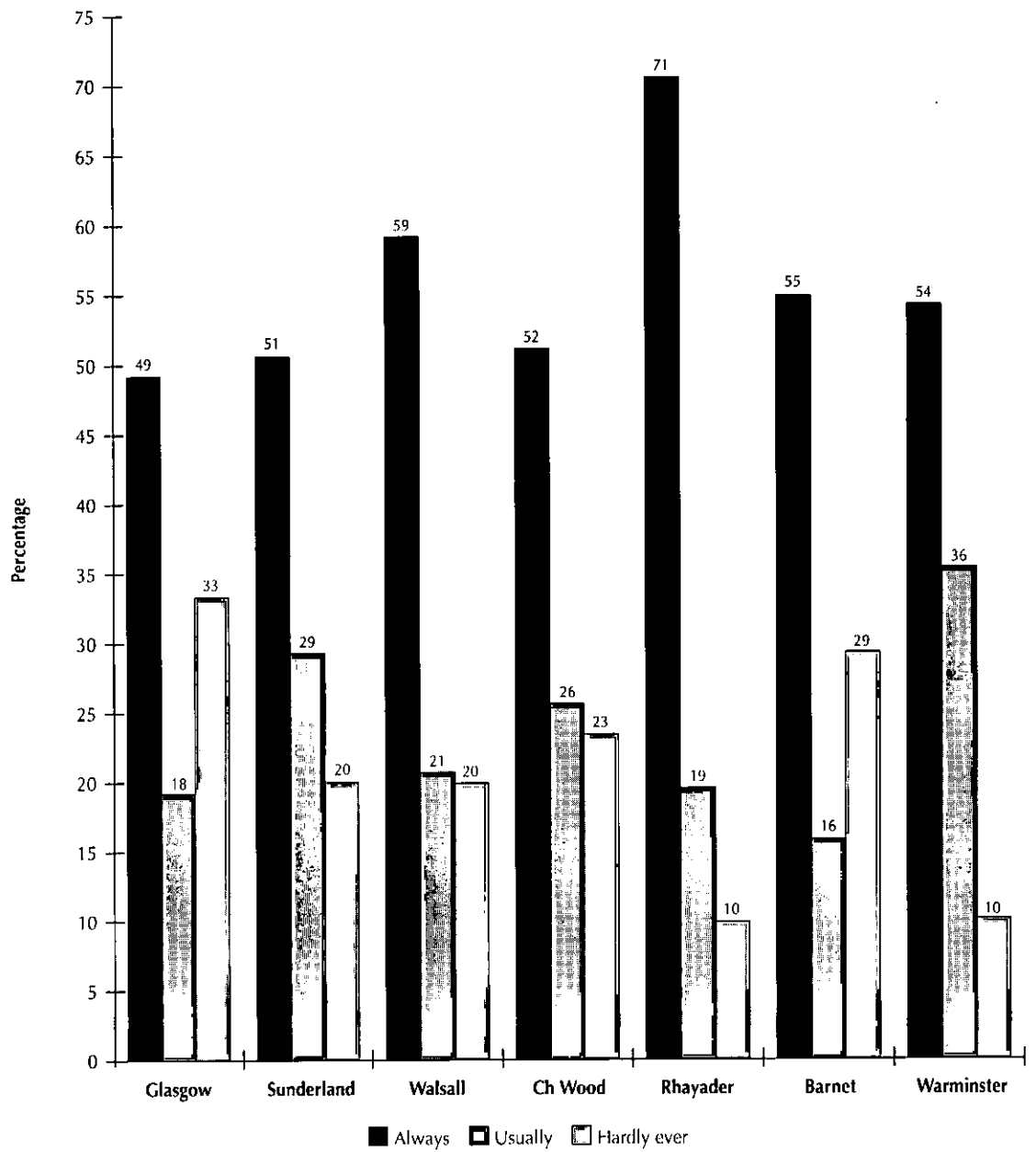*Cycle helmet wearing*
rate by area of Britain
(helmet owners only)

Percentage

| Glasgow | Sunderland | Walsall | Ch Wood | Rhayader | Barnet | Warminster |

■ Always ☐ Usually ▨ Hardly ever

Figure F.12
Percentage of bike
owners who always
wear their cycle
helmet by area
of Britain

Percentage

| Glasgow | Sunderland | Walsall | Ch Wood | Rhayader | Barnet | Warminster |

Figure F.13
Mean age at which
children thought that
they would be able to
cross any road safely
on their own
by area of Britain

£15.00

FDN16 (5/95)