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THE EFFECTIVENESS OF CHILD CYCLE TRAINING SCHEMES

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EXECUTIVE SUMMARY

Every year, over three and a half thousand cyclists aged ten or over are killed or injured in road accidents (Department of Transport, 1995). Various cycle training schemes have been in operation since 1947, with the aim of reducing the number of these accidents. These courses involve a significant commitment in terms of time and other resources from Road Safety Officers, trainers and the children themselves. This study was therefore undertaken to assess whether cycle training has an effect on road safety knowledge and cycling skills of children aged around twelve (approximately two years after they have attended a cycle training course). The second objective of this study was to determine whether particular courses are more effective than others.

A total of 1,974 children took part in the study. Half had not received any formal training and the remainder had received training on one of eight courses. The children took part in a general knowledge quiz while at school and then performed various manoeuvres on a bicycle at a quiet 'T' junction near the school. These manoeuvres included turning left, right and overtaking a parked car. The children also completed a cycling log book for one week. This information was collected in order to assess the extent to which exposure affects cycling ability. The children also answered ten questions designed to elicit information about the degree to which they take risks when riding.

It was found that the trained children performed significantly better than the untrained children on the practical test, with more trained children receiving an overall assessment of 'safe'. The trained children also performed better in the knowledge quiz.

The four courses found to be most effective, with regard to the 'safety rating' scored during the practical on-road test, were those which included an on-road training element and were conducted over several weeks (rather than intensively over one or two weeks). Also courses consisting of more than one stage, each stage being completed at a different age, were found to be effective.

The type of instruction also affected children's safety ratings. Children who had been trained on the cycling awareness type of courses (using a problem solving approach) were generally found to perform better than children who had completed the instruction based types of courses.

The results of the study suggest that training children to ride safely has a lasting positive effect on their cycling practice and knowledge of road safety.

THE EFFECTIVENESS OF CHILD CYCLE TRAINING SCHEMES

ABSTRACT

Every year, large numbers of children are killed or injured in road accidents when riding their bicycles. The present study aimed to assess whether cycle training schemes lead to improved, safer cycling skills and knowledge. A total of 1,974 children took part in the project. They completed a quiz containing questions about the Highway Code and their cycling skills were assessed when performing manoeuvres at a 'T' junction. It was found that children who had received formal cycle training tuition were more likely to be rated as 'safe' when performing cycling manoeuvres than the untrained children. The trained children also received significantly higher scores on the knowledge quiz. Differences were found between different types of cycle training courses.

1. INTRODUCTION

In 1994, over three and a half thousand cyclists aged ten or over were killed or seriously injured in road accidents (Department of Transport, 1995). A further eighteen thousand sustained minor injury. However, these figures are likely to be under-estimates as cycling accidents have been found to be under-reported (Mills, 1989; James 1991). Various cycle training schemes have been introduced in an attempt to reduce casualty numbers by encouraging lifelong safe cycling behaviour.

The National Cycle Proficiency Scheme (NCPS) was instituted in 1947 to train children aged 9 to 10 in the basics of safe cycling. In 1957, 37,000 children passed the NCPS test, and in recent years between 275,000 and 300,000 children receive NCPS or similar training each year. These data imply that about 40 per cent of each annual cohort of children are now receiving training by their twelfth birthday.

Cycle training aims to make child cyclists safer on the road by extending their knowledge and cycling skills. Tests of cycling skills focus on two aspects of cycling performance: basic control ability and the use of safe behaviours. Basic control is concerned with the ability to mount and dismount safely, to ride in a straight line, to go round reasonable curves without falling off, and to use brakes correctly. Safe behaviours include looking for other traffic, signalling and road position, travelling at speeds appropriate to the conditions and observing and obeying road signs. In addition, all current schemes include a bicycle safety check and riding practice. Some also include teaching the parts of the Highway Code relevant to cyclists. However, it is often argued that children's knowledge of road safety matters is not translated into behaviour so that observation of behaviour is a better assessment of safety than the measurement of knowledge. Previous research has shown how these cycling skills can be assessed and measured (Bennett et al, 1979).

A typical course of cycle training will take 4 to 8 separate sessions, with each session lasting 1 to 1½ hours. If it is assumed that each child commits seven hours to the course, then this suggests a total child-time commitment of about 2 million hours per year and probably over 200,000 hours of adult instructor time per year. This is a considerable time, equivalent to roughly one person year per local authority - the local authority Road Safety Officers (RSOs) estimate that on average cycle training takes between a quarter and a third of their resources (Royal Society for the Prevention of Accidents, 1993; 1994).

As cycle training represents a significant commitment by children and Road Safety Officers, it is important to identify whether courses are effective in leading to improved abilities and, ultimately, fewer road accidents. The main objective of the present research therefore was to determine whether cycle training schemes per se are effective and, of those that exist, which are the most effective in increasing road safety knowledge and improving cycling skills.

2. METHOD

2.1 SAMPLE SELECTION

The Royal Society for the Prevention of Accidents (RoSPA) was asked to identify courses that met criteria set by TRL. The requirement was to include:

- courses run by a variety of local authorities, giving a wide geographic spread;
- a range of course types, including both instruction based and cycling awareness based training;
- courses which included training on public roads, and courses where the children only practised on playgrounds or other off-road places;
- training schemes administered over different periods of time. For example many courses are given for say an hour a week for several weeks, whilst others

may be delivered more intensely over a shorter time period. Also, some courses consist of more than one stage, each stage being given at a different age (usually a different school year).

- schemes where the children were trained at different ages. (However, whilst it was possible to find Local Authorities who were willing to administer training at ages other than 10 or 11, in practice few children younger than this were actually trained. This requirement was therefore abandoned.)

Using these selection criteria, the following eight courses and variations of courses were selected for study through the guidance of RoSPA:

- Four variants of the National Cycling Proficiency Scheme (NCPS)

  The NCPS courses are based on a syllabus developed by RoSPA, and involve children being instructed in set procedures that they should apply when carrying out any riding manoeuvre. The four variants selected for study include courses completed in less than two weeks *(intensive)* and those lasting more than a fortnight *(extensive)*. In addition, two courses included *on-road* tuition and two provided practical tuition in an *off-road* situation.

- Rightrack Cycling Awareness Programme

  The Rightrack Cycling Awareness Programme is a later course developed by RoSPA and Buckinghamshire County Council. It adopts a problem solving approach in which the trainees work out for themselves, with guidance from a tutor, the dangers of cycling and how to ride safely. Rightrack includes on-road training and takes place over a number of weeks.

- Scheme run in Oxfordshire

  Oxfordshire County Council's course is cycling awareness based, takes place over a number of weeks and includes on-road training.

- Scheme run in Croydon

  The Croydon scheme is a two stage course. Part One takes place in the playground over one week and involves a combination of instruction and cycling awareness. Part Two is conducted entirely on-road and is cycling awareness based. Part Two is optional and therefore not all children who complete Part One go on to do Part Two.

- The Scottish Cyclist Training Scheme

  The Scottish Cyclist Training Scheme has three levels. Level One is for children under nine years of age and involves activity sheets that can be completed in class with additional sheets aimed at parental involvement. Level Two is partly classroom based but mainly involves off-road cycle skills training. Level Three requires practical on-road training and a test for children aged nine years or over. Children may do Level Three without completing Levels One and Two but must prove knowledge of the Highway Code. All levels receive a certificate and a badge accompanies successful completion of Level Three.

The children who took part in the study were contacted through their schools. The intention was to identify, for each type of course, eighty children who had attended the cycle training scheme and eighty untrained children. To achieve this, eight secondary schools were contacted in each area. Where possible, schools with a range of educational achievements were selected to avoid educational abilities biasing the results. This was achieved by examining the Department for Education data to identify schools in the mid range of academic achievements (between 25% and 45% of pupils attaining five or more GCSEs at grade C or above). It was not always possible, however, to identify eight schools in this range in the smaller local authorities.

All children in Year 8 (S1 in Scotland) in each of the eight schools were asked to complete a one page sampling questionnaire (see Appendix A). (The sampling questionnaire was altered slightly for Croydon and Scotland to reflect the multi-stage nature of these courses.) The aim of this questionnaire was to identify thirteen children who had received the appropriate cycle training for their school area and a matched sample of thirteen children who had received no formal cycle training. This oversampling allowed for up to three trained and three untrained children dropping out.

The original intention had been to ask the teachers to assess each child's intellectual abilities. However, this proved impractical and the teachers were instead asked to identify children with learning disabilities. Children with physical disabilities were also screened out to avoid this affecting the results of the practical test. Children who never cycled or did not own a bicycle were excluded from the sample.

The groups were matched for sex (half boys, half girls) and cycling experience (one third saying they cycled seven or more times a week in the summer, one third cycling two to six times and the remainder cycling once a week or less). A random sample of the children within each of the stratifications was selected for the study. As children were selected from a range of primary schools, biases in instructor abilities were randomised.

The local RSO was asked to confirm whether the children had received the appropriate type of cycle training.

2.2 EXPERIMENTAL PROCEDURE

A day was arranged with the school for the tests. All twenty six children in each school completed an eight page cycling knowledge test (see Appendix B). Each of the 25 questions was read out by a member of TRL staff and the children were asked to tick the correct box or write the answer on the quiz sheet. The quiz included questions relating to the Highway Code and how they rode their bicycle (e.g. whether they used a cycle helmet). Any children who said they had been involved in a road accident whilst riding their bicycle were asked to complete a short questionnaire about the accident.

After completing the quiz, those children who had obtained parental consent were taken in small groups to complete the on-road practical test. This test was conducted according to the NCPS test procedures. A T-junction close to the school was selected and the children asked in turn to perform a variety of manoeuvres, including making left and right turns and overtaking parked vehicles (see Appendix C). The assessor (a retired Road Safety Officer) used a pre-coded form to assess how well each child performed each manoeuvre and gave a safety rating (safe/unsafe) overall and for each manoeuvre. The assessor was not told who had received cycle training and who had not. The assessment form is contained in Appendix D. All children who took part were required to wear a reflective fluorescent belt ('Sam Brown') and a cycle helmet. These were provided by TRL where necessary. Where possible, children rode their own bicycles, but if this was not possible, and they were not able to borrow a friend's bicycle, a bicycle was provided by TRL.

After completion of the quiz and the practical test, the children were asked to take home a cycling log book and to record for seven days if, when and where they rode their bicycles. The children were asked to return their completed logs to their teacher at the end of the seven days, and these were returned to TRL. In order to increase the return rate, the names of all children who returned their log were put into a 'hat' and a draw for £25 was made every two months.

The above procedures were implemented from October 1994 to November 1995 after piloting all the procedures in two schools in Berkshire.

2.3 SAMPLE DETAILS

Children from ninety three schools took part in the study. Table 1 shows the numbers of trained and untrained children who completed each part of the study. It should be noted that all of the 26 children who were in school on the day of the Test completed the Knowledge Quiz. Fewer performed the practical test, as parental consent was required and fewer still returned cycling log books.

A total of 1,974 participants completed the knowledge quiz. Just over half (51%) of these were trained, and 53% were boys. Fewer, 1,566 children, completed the practical test as parental consent was not always obtained. Fifty seven per cent of these were boys and fifty one per cent had been trained. Less than half of the pupils (807) completed the cycling log. Of these, 55% had received cycle training and 48% were boys.

In total, seventy seven children reported accidents on the road or pavement. However, with no parent or other adult present, these accidents could not be corroborated. Almost half of these accidents did not involve another vehicle ("just fell off"). As the number of accidents was low and few of these had returned their cycling logs, these data were not analysed further.

TABLE 1

Sample sizes by course type

Type of course	Knowledge Quiz completed		Practical test completed		Cycling logs completed	
	Trained	Untrained	Trained	Untrained	Trained	Untrained
NCPS, off road, intensive	228	207	185	168	99	78
NCPS, on road, intensive	182	184	158	154	82	76
NCPS, off road, extensive	43	44	38	34	19	15
NCPS, on road, extensive	108	107	84	75	52	30
Righttrack	205	209	170	170	85	80
Oxford Righttrack	90	87	70	65	42	40
Croydon Righttrack	52	60	39	34	18	23
Scottish Cyclist Training Scheme	89	79	61	61	45	24
Total	997	977	805	761	442	366

3. EFFECTIVENESS OF CYCLE TRAINING

3.1 ON-ROAD PRACTICAL TEST

Table 2 shows that most of the trained children obtained a 'safe' rating by the assessor in the on-road practical test. This is statistically significant[1] (χ^2=83.89, p<0.001). Overall, there were no significant differences in the safety ratings between boys and girls. Children who rode their own bicycle obtained higher safety ratings than those who rode the TRL bike or borrowed one from a friend. However, there was no interaction between this and whether the children had been trained (χ^2=3.5, p<0.17).

Appendix E lists the faults made by both trained and untrained children, and gives the level of statistical significance between the two groups.

3.2 GENERAL KNOWLEDGE

Those quiz questions where less than eighty five per cent of children gave a correct answer were summed to give a normally distributed quiz 'SCORE' value. Thirteen questions were included in this variable. The trained children scored significantly higher than the untrained children on the knowledge quiz SCORE (t=10.54, df=1972, p<0.0005). The mean score for the trained children was 8.8 and 7.7 for the untrained children. Table 3 gives the results for individual questions where the difference is statistically significant (taking all quiz questions into account). The question numbers given in this Table refer to the questionnaire which can be found in Appendix B.

Overall, boys scored an average of 8.5, significantly higher than the girls' average of 7.9 (t=5.44, df=1972, p=0.0005).

The scores of pupils in the higher ability schools (i.e. those with over 40% of pupils achieving five GCSEs at grade C or above) were compared with those in the lower ability schools (i.e. 40% or less with 5 GCSEs at grades A, B or C). The higher ability schools achieved an overall average of 8.52, compared to 8.12 in the lower ability schools (t=3.03, df=1618, p=0.002). However, the interaction between school ability and whether the children were trained was not statistically significant.

Junctions and priority

The untrained children scored significantly lower than the trained children for three of the five questions in this section (see Table 3). Over half of both trained and untrained children answered Question 10 incorrectly: this concerned vehicle priorities when turning right into a minor road. In addition, 18% of all children thought they should carry on cycling carefully at a roundabout instead of first looking to the right and letting traffic pass. A further 18% thought they should look to the left, but it is possible some of these did not know left from right.

Traffic signs, signals and road markings

Sixteen questions related to traffic signs, signals and road markings. Eleven of these were scored as correct by significantly more trained than untrained children (see Table 3). Examples of differences include 40% of untrained children not being aware of STOP lines or give way markings and their associated meaning. There were some large differences in knowledge of road signs, notably Questions 14c, 14d, 14f and 14g relating to 'No vehicles', 'No cycling allowed', 'Only bicycles allowed' and 'No pedestrians' respectively. Nearly three quarters of all children were not aware that red and amber lights together mean 'STOP'. Seventy one percent of all children thought the signal meant 'Go if it is safe to do so'.

Effects of poor weather

Four questions were asked about awareness in poor weather conditions. The responses of the trained children were not significantly different from those of the untrained children for any of the questions.

TABLE 2

Overall assessment of 'safe' or 'unsafe' by whether trained or untrained

Children	Practical test rating		
	Safe	Unsafe	Total
Trained	603 (75%)	202 (25%)	805
Untrained	401 (53%)	360 (47%)	761
Total	1004 (64%)	562 (36%)	1566

[1] A statistically significant result means that the difference between the trained and untrained children is unlikely to have occurred by chance. This chance is expressed as a probability, where p<0.01 means the chance of accepting a difference as genuine when it has occurred by chance (falsely rejecting the null hypothesis) is one in a hundred, or one percent. A probability level of p<0.001 means the likelihood of falsely rejecting the null hypothesis is one in a thousand, and so on.

General

Four general questions were asked and three of these showed significant differences, as shown in Table 3. Significantly more trained children answered correctly that it is dangerous to wear a personal stereo whilst cycling, that a bicycle is a road vehicle rather than a toy and which are the correct lights and reflectors to have when riding at night.

3.3 CYCLING EXPOSURE

There were no significant differences between any of the exposure variables obtained using the cycling log and sampling questionnaire data, and trained and untrained children. Cycling exposure also did not differ between 'safe' and 'unsafe' children overall. Appendix G summarises the data obtained from the cycling logs.

3.4 RISK AVERSION

The risk aversion score was calculated by summing the total number of non-risky behaviours (Questions 9b to 9k in Appendix B). The trained children scored significantly higher (mean 5.38) than the matched controls (mean 4.99) for the risk aversion score ($t=4.60$, $p<0.001$), meaning that they were less likely to report risky behaviour (see section 4.4).

However this result could mean that risk aversive children (i.e. those who are inherently 'safe') were choosing to be trained, and that this risk aversion rather than cycle training led to safer cycling. A statistical technique called *hierarchical loglinear analysis* was used in order to examine the interaction between risk aversion, safety rating and whether or not the child has received training. It was found that for the same level of risk aversion, whether high or low, trained children are safer than untrained children. This means that any benefits exhibited by trained children compared with untrained children are a consequence of the training rather than of risk aversive children electing to be trained.

3.5 WEARING OF CYCLE HELMETS

Trained children were significantly more likely to report owning a cycle helmet and to wearing it 'most of the time' than untrained children (see Table 4).

A record was also made as to whether the children brought a cycle helmet with them to the on-road practical test (see Table 4). Those who did not were lent a TRL cycle helmet. Only 27% of children who said that they owned a cycle helmet actually brought it with them to the test.

TABLE 3

Responses to general knowledge questions

Question Type and number		Percentage with correct answer		Level of Significance (χ^2 test)
		Trained children	Untrained children	
Junctions and priority				
Q10	T Junction	49	40	<0.001
Q11	Staggered Junction	69	62	0.001
Q23	What should cyclists do at roundabouts	66	59	0.005
Traffic and road signs				
Q13a	STOP lines	70	60	<0.001
Q13b	Pedestrian crossing	96	92	0.001
Q13d	Give way marking	69	60	<0.001
Q14a	Zebra sign	95	90	<0.001
Q14c	No vehicles sign	89	78	<0.001
Q14d	No cycling sign	70	48	<0.001
Q14e	Crossroads sign	95	91	<0.001
Q14f	Only bicycles allowed sign	67	49	<0.001
Q14g	No pedestrians sign	92	83	<0.001
Q14h	Cycle lane sign	86	81	0.005
General Questions				
Q12f	It is dangerous to ride along listening to a personal stereo	98	95	0.010
Q12i	A bicycle is a toy, not a road vehicle	98	95	0.001
Q21	What must your bike have if you are riding at night?	77	72	0.005

* For questions not tabulated, no significant difference between trained and untrained was found.

TABLE 4

Ownership and use of cycle helmets

Behaviour or reported behaviour	Percentage of children		Level of Significance (χ^2 test)
	Trained	Untrained	
reportedly own a cycle helmet	61	38	<0.001
reportedly wear a helmet 'most of the time'	32	20	<0.001
brought a helmet to the test	18	11	<0.001

3.6 EFFECT ON CYCLE USE

Sixty per cent of children reported that they rode on the roads more often after they had been trained than before. Four per cent claimed that they rode less on the roads after training and the remaining 36% said training did not change the amount they rode on the roads. These proportions did not vary between courses.

3.7 EFFECT OF PARENTAL TRAINING

Some children who had not been formally trained said they had received training by their parents. However, no significant difference was found between the safety rating of those who had not been trained at all and those who had received parental training (χ =0.855, p=0.355). The results are shown in Table 5.

4. COMPARISONS BETWEEN COURSES

4.1 ON-ROAD PRACTICAL TEST

Overall safety rating

As discussed in section 2.2, children who did not have a bicycle to use for the practical test were lent one by TRL. The proportion of children who borrowed the TRL bicycle varied considerably between courses (60% of those who had done an NCPS Extensive Off-road course versus 31% of those who had done the Oxford scheme). Seventy per cent of children who rode their own bike were rated as 'safe' compared to 60% of those using the TRL bike (χ^2=19.4, p<0.001). Therefore this "bicycle ownership" variable was built into the statistical model to ensure that any effects detected were attributable to the course and not purely to the bicycle ridden.

Hierarchical loglinear analysis showed that, irrespective of the bicycle used, the interaction between safety rating, course type and trained versus untrained to be significant (partial χ^2=21.1, p=0.004). The results are shown in Figure 1. (NB. The vertical axis scale refers to the deviation from the 'expected value'. i.e. a value of 2 means that there were twice as many children in this 'cell' as expected.) On each course the trained children were more likely to be rated as 'safe' than the untrained children but there are differences between courses. As the figure shows the Scottish, Croydon, Righttrack and NCPS Extensive On-road courses were the most effective.

Unsafe manoeuvres

Table 6 shows the percentage of trained children who were judged to perform each of the six tested manoeuvres unsafely. It should be noted that one 'unsafe' manoeuvre may not necessarily indicate an overall 'unsafe' marking.

Faults made

The most common fault made by all trained children was bad pedalling. This usually meant pedalling with the arch, rather than the ball, of the foot. The incidence rate for this fault varied between 69% of trained children in the Croydon area to 85% of those who had completed an NCPS Intensive On-road course.

TABLE 5

Children trained by their parents

Safety rating for practical test	Percentage of children (n=697)	
	Not trained at all	Trained by parents
Safe	51	55
Unsafe	49	45

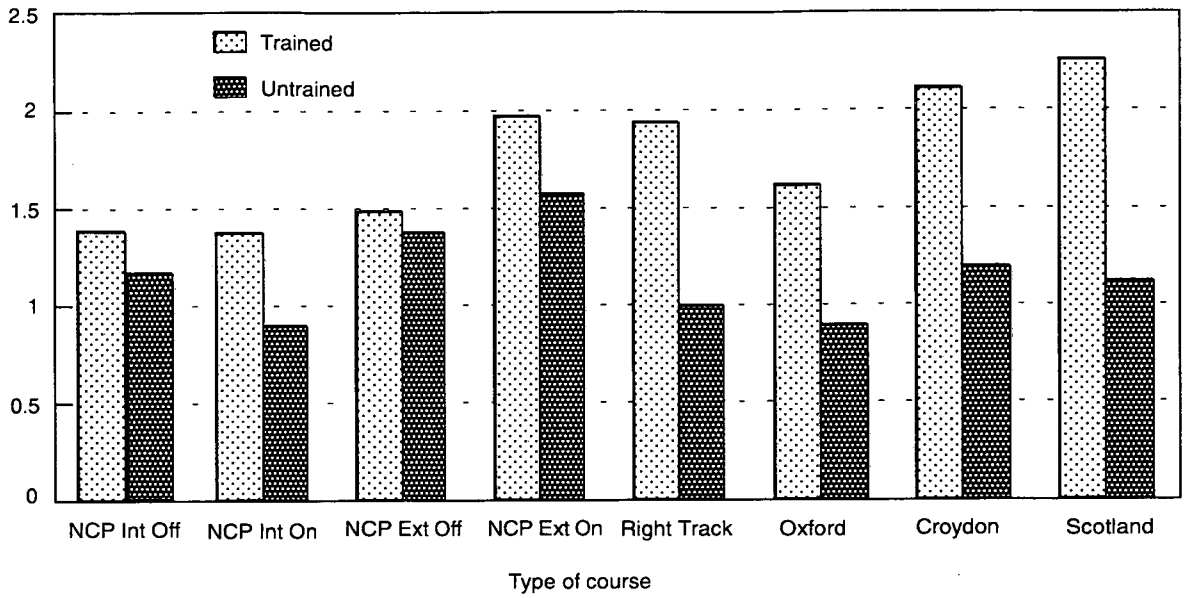

Figure 1. Children rated as 'safe' by whether trained or untrained

A second fault which was found to be prevalent in all course groups was failing to signal before stopping. This varied between 54% of those who had completed the Scottish course and 87% of NCPS Intensive On-road pupils.

A list of the remaining errors which were made by at least 10% of trained children as a whole was collected. This list was then analysed by course and the results are shown in Appendix F.

4.2 GENERAL KNOWLEDGE

The participants who had done the Scottish ($t=5.48, df=166, p<0.001$), Croydon ($t=3.48, df=110, p=0.001$), NCPS Intensive Off-road ($t=5.95, df=433, p<0.001$) or Righttrack ($t=6.21, df=412, p<0.001$) courses obtained significantly higher general knowledge scores than the untrained controls from these areas (see Figure 2). No statistically significant difference was detected between trained and untrained children in the other areas.

There were no significant differences between courses, implying that no course had a significantly bigger effect than any of the others.

4.3 CYCLING EXPOSURE

No significant differences in riding habits were found between courses.

TABLE 6

Unsafe manoeurves by course type

Course type	No. in trained sample	% of trained who performed unsafe manoeuvre					
		Starting	Overtaking parked car	Left turn	Right turn (Major - Minor)	Right turn (Minor - Minor)	Stopping
NCPS Intensive Off-road	185	56	29	25	28	23	11
NCPS Intensive On-road	158	27	12	22	25	13	21
NCPS Extensive Off-road	38	47	13	18	34	16	24
NCPS Extensive On-road	84	37	17	17	18	14	7
Righttrack	170	28	12	17	17	15	8
Oxford	70	33	21	20	16	16	4
Croydon	39	5	0	8	8	3	0
Scottish	61	18	15	20	16	16	3

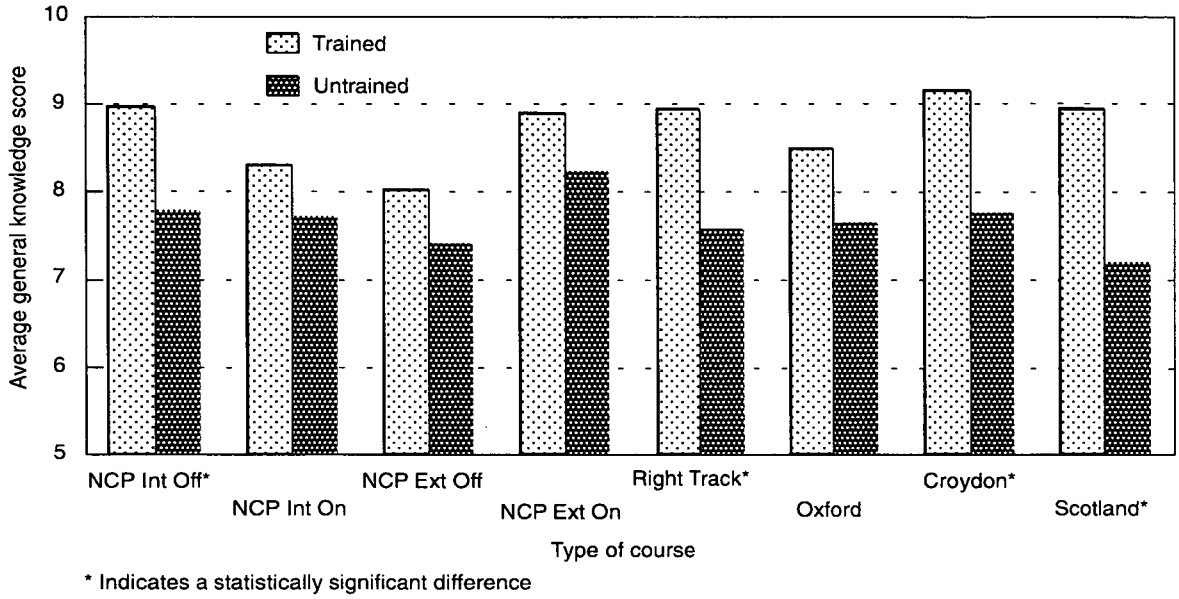

Figure 2. Average general knowledge scores by course

4.4 RISK AVERSION

Righttrack was the only course that showed a statistically better (t=3.09, p=0.002, df=412) risk aversion score for the trained children than for the controls (5.3 trained versus 4.8 untrained). It should be noted that the overall trained/ untrained effect reported in section 3.4 is probably due in fact only to this 'Righttrack effect'. This has occurred because of the large sample of Righttrack students (see Table 1).

4.5 WEARING OF CYCLE HELMETS

For all courses except NCPS Extensive Off-road, more trained children said that they owned cycle helmets than untrained children (see Table 7).

A comparison between courses showed that amongst the trained children, fewer who had completed the NCPS Intensive On-road course said that they owned cycle helmets than those who had done other courses (z=3.51, df=7, p<0.001). There were no significant differences between courses amongst the untrained children.

When the children performed their practical cycling test, a record was made as to whether they had brought a bicycle helmet with them. Righttrack was the only course which appeared to have significantly affected cycle helmet wearing: 17% of trained children brought them to the test compared with only 7% of the untrained children (χ^2=7.80, p=0.005).

Overall amongst the trained children, those who had done the Oxford course were most likely to bring cycle helmets

TABLE 7

Percentage of children reportedly owning a cycle helmet - tabulated by course

Course	Trained	Untrained	Level of significance (χ^2 test)
NCPS Intensive Off-road	57	35	<0.001
NCPS Intensive On-road	49	35	0.006
NCPS Extensive Off-road	56	46	0.334
NCPS Extensive On-road	58	38	0.004
Right Track	68	32	<0.001
Oxford	73	53	0.005
Croydon	65	35	0.001
Scottish	70	44	0.001
All courses	61	38	<0.001

with them (38% compared with an overall average of 18%). However, there was no significant difference between trained and untrained children's wearing rates in Oxfordshire which implies that this effect is not attributable to cycle training.

4.6 ENJOYMENT OF CYCLE TRAINING

The level of enjoyment of cycle training varied according to course, as shown in Table 8. The most popular courses were all variations of NCPS. The multi-stage courses, particularly the Scottish course, appear to be less popular with the children.

TABLE 8

Enjoyment of cycle training courses

Course	Percentage who said they enjoyed course
NCPS Intensive Off-road	90
NCPS Intensive On-road	93
NCPS Extensive Off-road	96
NCPS Extensive On-road	92
Righttrack	89
Oxford	82
Croydon	88
Scottish	77

4.7 VARIATIONS OF THE NCPS COURSE

As described in section 2.1, this study included four variants of the NCPS course: on-road versus off-road and extensive versus intensive. This section examines the variants to try to identify the most effective combination.

On-road versus off-road training

The performance of children who had attended an NCPS off-road course was compared with that of children who had attended NCPS lessons where an opportunity was given to practice on public roads. Slightly more children who had received on-road instruction obtained ratings of 'safe' on the practical test, but this effect was not statistically significant (χ^2=0.791, p=0.374). There was no significant difference between the knowledge scores of the children who had received on-road training and those who had received off-road training (t=1.33, df=559, p=0.185). There was also no significant difference between the two groups on the risk aversion scores (t=0.11, df=559, p=0.910).

Intensive versus extensive

The performance of children who had completed an intensive NCPS course was compared with those who had attended an NCPS extensive course. Whilst those who had completed an extensive course were slightly more likely to be rated as 'safe' than those who had received intensive instruction, this difference was not statistically significant (χ^2=1.59, p=0.207). There were no significant differences between the two groups' general knowledge scores (t=0.10, df=559, p=0.918) or risk aversion scores (t=1.10, df=559, p=0.274).

In conclusion, whilst it was not possible to determine statistically significant differences between the four NCPS variations, it should be noted that the four courses which appear to be the most effective (see section 4.1) all include an on-road training element and are conducted over a number of weeks.

5. DISCUSSION

This research confirms that cycle training does improve cycling skills and knowledge, and the effect lasts for at least two years after training. Although some of the untrained children had received informal cycling instruction from their parents, they performed similarly to those who had received no training at all. This suggests that, although some parents may be effective at teaching good cycling skills, overall these children should still be encouraged to take part in a formal cycle training course. It is possible, for example, that parents may pass on their own bad cycling practice to their children. Although the combination of formal cycle training *and* parental guidance together has not been explored in this study, it is noted that the Scottish Training scheme, which does encourage parental involvement was found to be a very effective package.

Rather surprisingly, reported cycling exposure was not found to affect the practical test safety rating of the children, but this may have arisen because of inappropriate exposure measures. The cycling log covered one week and it was calculated at the outset that the sample size was sufficient to give a detailed profile of children's cycling habits. However, it was impossible to establish whether the information given was correct and complete and, in any case, the return rates were low, despite the use of incentives.

As cycling courses are voluntary, inherently safer children (or their parents) may be more likely to select themselves for these courses than unsafe children. However a test for this effect showed that training was associated with safer cycling (and greater road safety knowledge) irrespective of the level of risk aversion.

Observations of how children perform a number of manoeuvres may not give a true account of how they ride in practice. Therefore, it can be argued that children who obtain a 'safe' rating may be less 'safe' when riding normally, and that they simply know how to ride safely when being tested. However, as the children were aware they were being observed, it can also be argued that those children who obtained a rating of 'unsafe' are truly unaware of how to ride safely. Some of the manoeuvres failed by the untrained children are of particular concern; just under a third (27%) failed to signal before turning left and more than third (36%) failed to look back when turning right from a major road into a minor one. Three quarters of the untrained children adopted an incorrect road position when overtaking a parked car and a similar percentage (71%) did not look back before setting off.

It is encouraging to note that trained children were more likely to report owning and wearing a helmet than untrained children. However, only 27% of children who said they owned a helmet brought it to the practical test.

Four versions of the NCPS were compared to assess whether on-road experience and length of course influences the effectiveness of the training. Children who had received on-road training were found to be slightly more likely to be rated as 'safe', but this effect was not statistically significant. Previous research (Wells et al, 1979) has found that children who receive on-road training perform better when tested six months after having been trained. It is therefore possible that the two years since training in the present study has weakened this effect, as children are likely to have gained practical experience on the road. Similarly, slightly more children who had attended extensive courses obtained ratings of 'safe' than those who had received intensive instruction. This effect was not statistically significant, but again, practical experience since the training may have weakened the differences between the two groups of children.

However, it should be considered that whilst no significant benefits of on-road training were found in conjunction with NCPS training, the four courses which were found to have the greatest benefits all include an on-road element: Scottish Training Scheme, Righttrack, Croydon and NCPS conducted over several weeks.

It should also be noted that, whilst it is clear that either an extensive or multi-stage course has the greatest benefit, a multi-stage course would presumably involve the use of far greater funds and resources for only a small increase in safe behaviour.

For all eight courses examined, the trained children performed significantly better than the untrained children in the practical test. Half of the courses appeared to improve children's knowledge scores. Some courses achieved better results, but the matched controls also varied between courses. The results suggest that the instruction based courses were not as effective as those based on cycling awareness. The courses varied as to which manoeuvres the children failed, and this information could be used by the course designers and organisers to help improve their effectiveness.

6. FURTHER WORK

In order to assess the value of cycle training in terms of casualty reductions, a hospital-based study of casualties could be conducted. Mills' (1989) study of Oxfordshire cyclist casualties suggests that trained young cyclists are about three times less likely to become casualties as those untrained.

The difference in risk is very great: if it is directly attributable to training itself, and not related to some bias arising in the population accepting training and the untrained population, then a casualty saving of about 9,000 per year amongst 12 to 15 year olds could be attributed to cycle training. This represents a cost benefit saving of about £250 million (Department of Transport, 1995).

The validity of this estimate could be checked by surveying cyclist casualties between the ages of twelve and fifteen who have attended Accident and Emergency departments and comparing them with a sample of cyclists in the same age group drawn from the schools in the hospital catchment areas. This would provide a true estimate of the value of cycle training courses in terms of casualty savings.

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The authors would like to thank the various people who assisted with the research. These include Terry Smith who carried out all the on-road practical assessments and Kevin Clinton from RoSPA who made contact with the Road Safety Officers. A number of staff at TRL assisted with the project, and the authors would like to extend thanks to Jill Davies, Gerry McClean and Joanne Stone who assisted with administration of the project, contacted the schools and collated the data. Thanks also to the TRL interviewing team who administered the general knowledge quiz in each school. The researchers would like to thank the following Road Safety Officers for assisting with this project:

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Brierton, Cleveland
Broadoak, Trafford
Brownhills Community, Walsall
Campion, Warks
Cantonian, South Glamorgan
Cathays High, South Glamorgan
Chalfont Community, Bucks
Cheshunt, Herts
Coleshill, Warks
Colne Valley High, Kirklees
Cooper, Oxon
Corpus Christi, South Glamorgan
Coulby Newham, Cleveland
Coulsdon High, Croydon
Cowbridge, South Glamorgan
Darwen Moorland, Lancs
De Brus, Cleveland
Denbigh, Bucks
Dyce Academy, Grampian
Eaglescliffe, Cleveland
Earlesheaton High, Kirklees
Edenham, Croydon
Faringdon, Oxon
Fartown High, Kirklees
Fitzharry's, Oxon
Francis Bacon, Herts
Glan Ely, South Glamorgan
Glyn Derw, South Glamorgan
Grange Upper School, Bucks
Grangefield, Cleveland
Great Marlow, Bucks
Green Lane High, Trafford
Harlaw Academy, Grampian
Hazelhead Academy, Grampian
Heysham, Lancs
The Highfield, Herts
Hollins High, Lancs
Holmfirth, Kirklees
John Mason, Oxon
Kincorth Academy, Grampian
Kings Langley, Herts
Larkmead, Oxon
Llanilltud, South Glamorgan
Longdean, Herts
Lostock High, Trafford
Mackie Academy, Grampian
Manor Farm, Walsall
Matthew Arnold, Oxon
Mirfield Free Grammar, Kirklees
Moor End High, Kirklees
Moorhead High, Lancs
Morecambe High, Lancs
New Wellington, Trafford
Norden County, Lancs
North Leamington, Warks
Northfield, Cleveland
Ousedale, Bucks
Park High, Lancs
Peterhead Academy, Grampian
Polesworth, Warks
Pool Hayes Community, Walsall
Portlethen Academy, Grampian
Queen Mary Boys, Walsall
Queen Mary Girls, Walsall
Queen Elizabeth, Warks
Queen's, Herts
Radcliffe, Bucks
Rosecroft, Cleveland
Royds Hall High, Kirklees
Sale, Trafford
Selsden High, Croydon
Shire Oak, Walsall
Shirley High, Croydon
Sir William Ramsey, Bucks

Sneyd Comprehensive, Walsall
Spen Valley, Kirklees
St Anthony's, Trafford
Stratford High, Warks
Streetly, Walsall
Thomas Alleyne, Herts
Turnford, Herts
Waddesdon C of E, Bucks
Wallingford, Oxon
Walton-le-Dale, Lancs
Whitchurch High, Glamorgan
Woodcote High, Croydon

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APPENDIX A: SAMPLING QUESTIONNAIRE

School code:

TRANSPORT RESEARCH LABORATORY
CYCLING SURVEY OF YEAR 8 PUPILS

1. Your name: _____

Please put a circle around each of your answers:

2. Do you have your own bicycle? **Yes** **No**

3. Do you ever ride a bike? **Yes** **No**
(It may belong to someone else.) **If you have answered 'No', please go on to question 8.**

4. How often do you ride a bike to school at this time of year?

Every school day	Between 2 and 4 times a week	About once a week	Less than once a week	Never

5. About how many other times do you go out on a bike each week at this time of year?

7 or more times	Between 2 and 6 times	About once a week	Less than once a week	Never

6. How often do you ride a bike to school in the summer?

Every school day	Between 2 and 4 times a week	About once a week	Less than once a week	Never

7. About how many other times do you go out on a bike each week in the summer?

7 or more times	Between 2 and 6 times	About once a week	Less than once a week	Never

8. Have you ever had any cycle training lessons in how to ride a bicycle properly? **Yes** **No**
If you have answered 'No', please go on to question 11.

9. Please write down how old you were when you had these cycle training lessons:
_____ **years old**

10. Can you tell us where you had these cycle training lessons. For example, if you had them at your last school, please write down the name of the school. If it was somewhere else, a recreation centre maybe, please tell us where it was.

_____

11. Please write down your date of birth. _____

12. What sex are you? **Boy** **Girl**

THANK YOU VERY MUCH FOR HELPING US

APPENDIX B: CYCLING QUIZ

Transport Research Laboratory
Cycling survey of Year 8 pupils

1. What is your name?
   (Please write in the box.)

2. What is the name of your school?
   (Please write in the box.)

3. What is your date of birth?
   (Please write in the box.)

4. What sex are you? *(Please tick one answer.)*

   ☐ **Boy**

   ☐ **Girl**

---

5. How old were you when you had your first two-wheeled bicycle? _____ **years old**

6. Do you own a cycle helmet?
   (Please tick one answer.)

   ☐ **Yes**

   ☐ **No**

7. Have you ever cycled to school before today?

   (Please tick one answer.)

   ☐ **Yes**

   ☐ **No**

   If you have answered 'No', then please go on to question 9 on the next page.

8. How old were you when you first cycled to school? _____ **years old**

YOU AND YOUR BIKE

9. Here are some sentences about cycling. If the sentence is **true**, then please put a circle around True'. If the sentence is **not true**, then put a circle around 'False'.

Please answer as honestly as you can. We are interested in what you <u>really</u> do when you go out on your bike.

a.	I sometimes go out bike riding with my parents.	**True**	**False**
b.	When I ride my bike, I usually ride as fast as I can.	**True**	**False**
c.	If the traffic is too busy, I usually get off my bike and push it.	**True**	**False**
d.	I wear a cycle helmet most of the time.	**True**	**False**
e.	I usually lock my bike when I leave it somewhere.	**True**	**False**
f.	I always wear fluorescent (or bright) clothes when I am cycling in the daytime.	**True**	**False**
g.	I always use my lights when I ride in the dark.	**True**	**False**
h.	I regularly check my tyres (or ask an adult to do it).	**True**	**False**
i.	I sometimes like to ride with no hands on the handlebars.	**True**	**False**
j.	I sometimes hold on to another cyclist or vehicle whilst riding along.	**True**	**False**
k.	I always wear reflective (or glowing) clothes at night.	**True**	**False**

l. How many accidents have you had when riding a bike in the last three years?
(Write the number on the line.)

_____ **accidents**

If you have not had an accident, then please go to question 10 on the next page.

m. Did you go to the Doctor or Hospital after any of these accidents?

☐ **Yes** ☐ **No**

n. Where did you have these accidents?
(You may tick more than one box.)

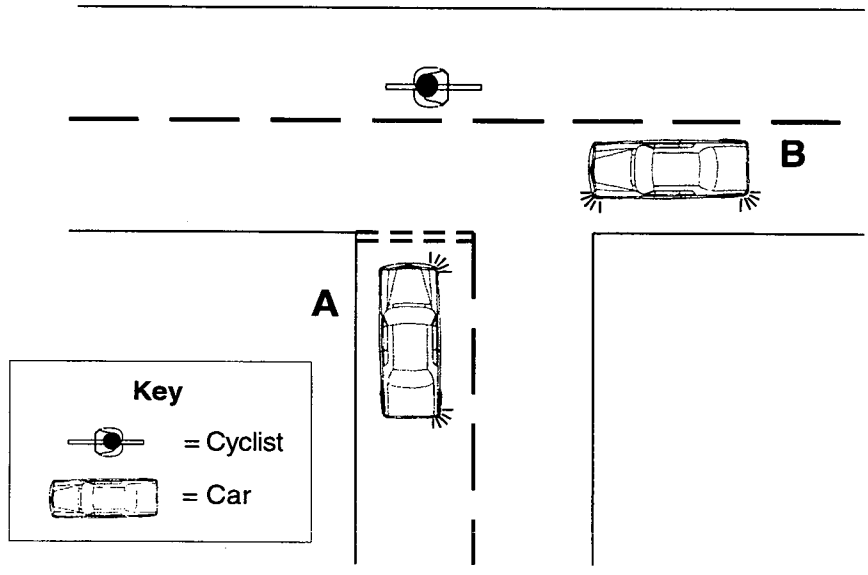
☐ **On the road** ☐ **On the pavement** ☐ **In parks or gardens**

☐ **In the countryside** ☐ **On cycle paths**

☐ **Other *(Please tell us where)*** _____

WHAT HAPPENS NEXT?

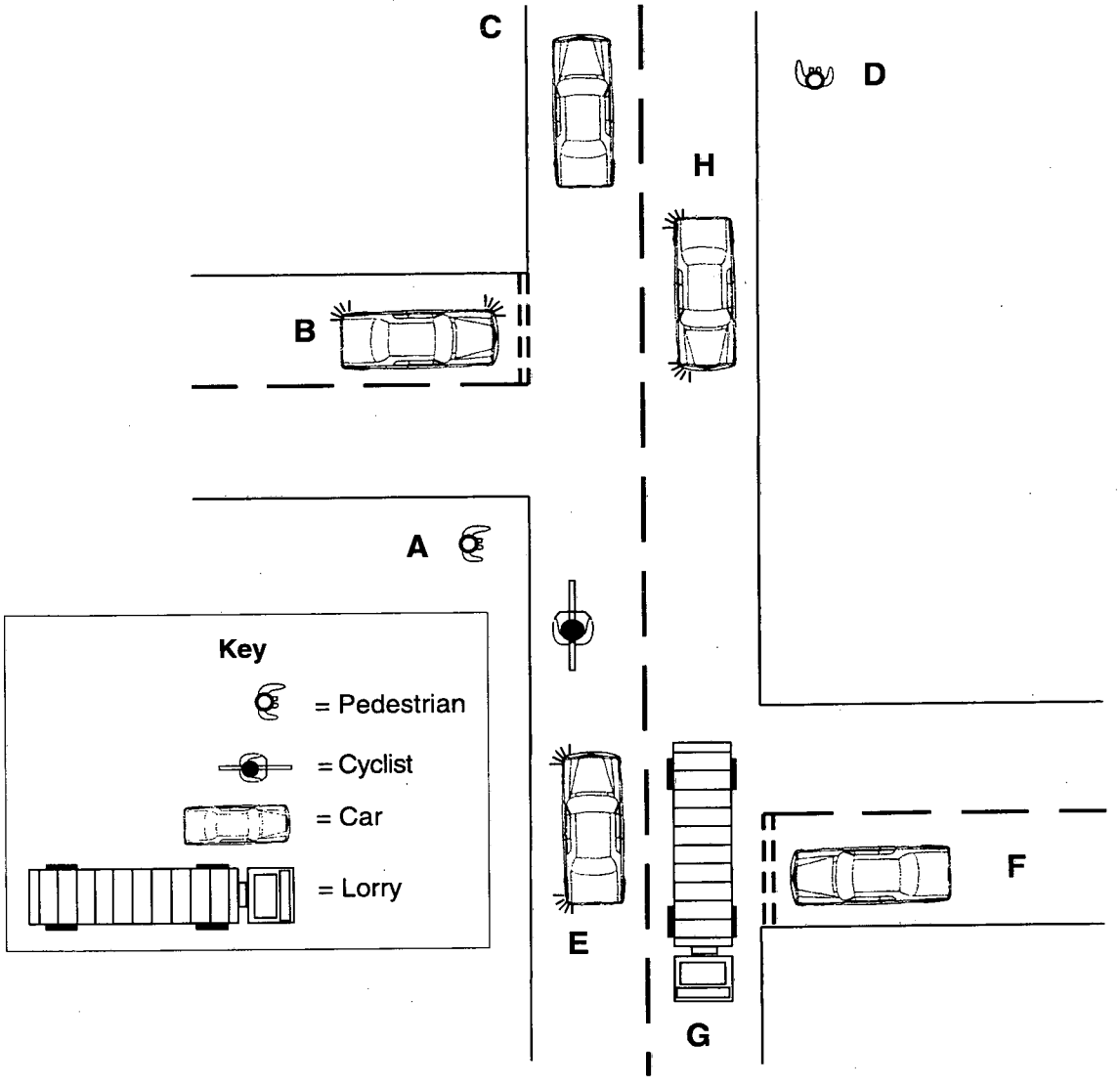
For the next question, please look at this picture.



10. The cyclist wants to turn right. What should she do?
(Please tick one answer.)

- ☐ **Wait for Car A to turn right and then go**
- ☐ **Wait for Car B to turn left and then go**
- ☐ **Wait for Car A to turn right, for Car B to turn left and then go**

For the next question, please look at this picture.



11. What are the <u>four</u> <u>biggest</u> dangers to this bike rider?
(Please tick <u>4 boxes</u>.)

- ☐ **Pedestrian A**
- ☐ **Car B**
- ☐ **Car C**
- ☐ **Pedestrian D**
- ☐ **Car E**
- ☐ **Car F**
- ☐ **Lorry G**
- ☐ **Car H**

'TRUE OR FALSE'

12. In the next section, some sentences are given about cycling and safety.

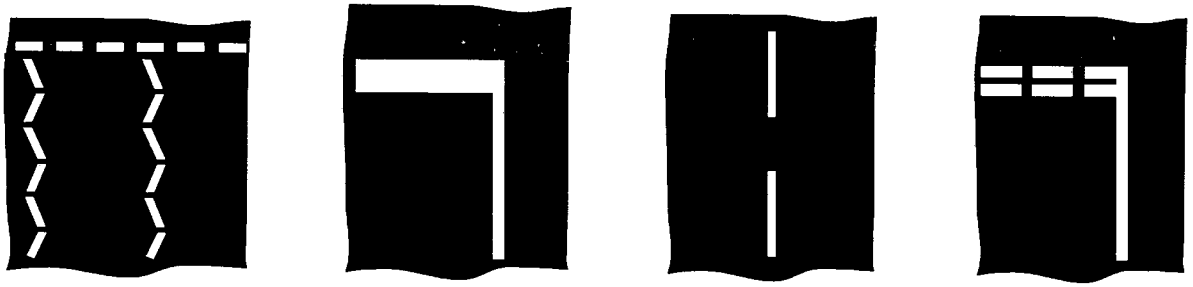
*If you think that the sentence is **true**, then please put a circle around 'True'. If you think that the sentence is **not true**, then put a circle around 'False'.*

a.	Cyclists must obey all traffic lights and road signs.	**True**	**False**
b.	It is easier to stop your bicycle in the rain.	**True**	**False**
c.	Other drivers can't see cyclists very easily in the rain.	**True**	**False**
d.	You should put your lights on if it is foggy.	**True**	**False**
e.	Strong winds are a danger to cyclists.	**True**	**False**
f.	It is dangerous to ride along listening to a personal stereo (or 'Walkman').	**True**	**False**
g.	Cyclists do not need to signal when they are turning left if there are not many cars about.	**True**	**False**
h.	Three people can all cycle along side-by-side on the road.	**True**	**False**
i.	A bicycle is a toy, not a road vehicle.	**True**	**False**

ROAD MARKINGS

13. *Here are some pictures of road markings.*

Try to match each of the road markings to its meaning. Please write the letter given under each picture next to its meaning in the table below.



A **B** **C** **D**

Meaning	**Letter**
These lines tell you to STOP.	
These lines tell you that there is a zebra or pelican crossing.	
These lines tell you the centre of the road.	
These lines tell you to make sure the road ahead is clear before you turn.	

ROAD SIGNS

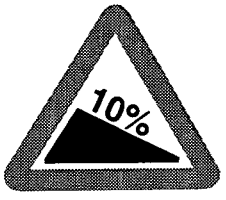
14. Here are some road signs and a list of meanings.

As you did in the last question, try to match each of the road signs to its meaning.
Please write the letter given under each roadsign next to its meaning in the table.

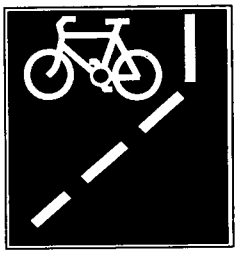
The first answer is given as an example.

THESE ROAD SIGNS ARE ALL SHOWN IN COLOUR ON THE POSTER AT THE FRONT OF THE ROOM.

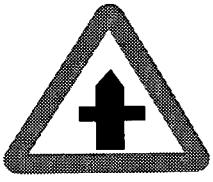
A



B

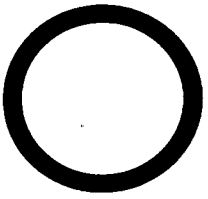


C



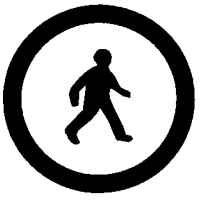
D

E

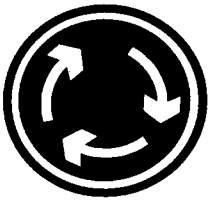


F

G



H



I

Meaning	Letter
Steep hill downwards.	B
Zebra or pelican crossing ahead.	
Mini roundabout ahead.	
No vehicles may enter.	
No cycling allowed.	
Crossroads ahead.	
Only bicycles allowed here.	
No pedestrians.	
Lane ahead for bicycles only.	

CYCLE TRAINING

Please tick one box for each question.

15. Have you ever had any lessons on how to ride a bike properly?

- ☐ **Yes**
- ☐ **No**

If you have answered 'No', then please go to question 21 on the next page.

16. Where did you have these lessons?

- ☐ **at school (from a teacher, Road Safety Officer, or someone else)**
- ☐ **at home (from your parents)**
- ☐ **somewhere else** *(Please write on the line where you had these lessons.)*

_____

17. After you had these lessons, did you ride your bike on the roads:

- ☐ **More often**
- ☐ **Same as before**
- ☐ **Less often**

18. Did you enjoy these lessons?

- ☐ **Yes**
- ☐ **No**

For the next 2 questions, please write your answer on the line.

19. Which part of your cycle training lessons did you enjoy the **most** (if you can remember)?

_____

20. Which part of your cycle training lessons did you enjoy the **least** (if you can remember)?

_____

GENERAL KNOWLEDGE

Please tick one box for each question.

21. What **must** your bike have if you are riding at night?

- ☐ **Back red light and back red reflector**
- ☐ **Front white light and back red light**
- ☐ **Front white light, back red light and back red reflector**

22. If someone is walking across a road that you want to turn into, what should you do?

- ☐ **Carry on cycling**
- ☐ **Ring your bell to warn them and then carry on cycling**
- ☐ **Stop and let the person cross**

23. What should cyclists do at roundabouts?

- ☐ **Look for traffic to the left and let it pass first**
- ☐ **Look for traffic to the right and let it pass first**
- ☐ **Carry on cycling carefully**

24. What do red and amber lights *together* mean at traffic lights?

- ☐ **Go**
- ☐ **Go if it is safe to do so**
- ☐ **Stop**

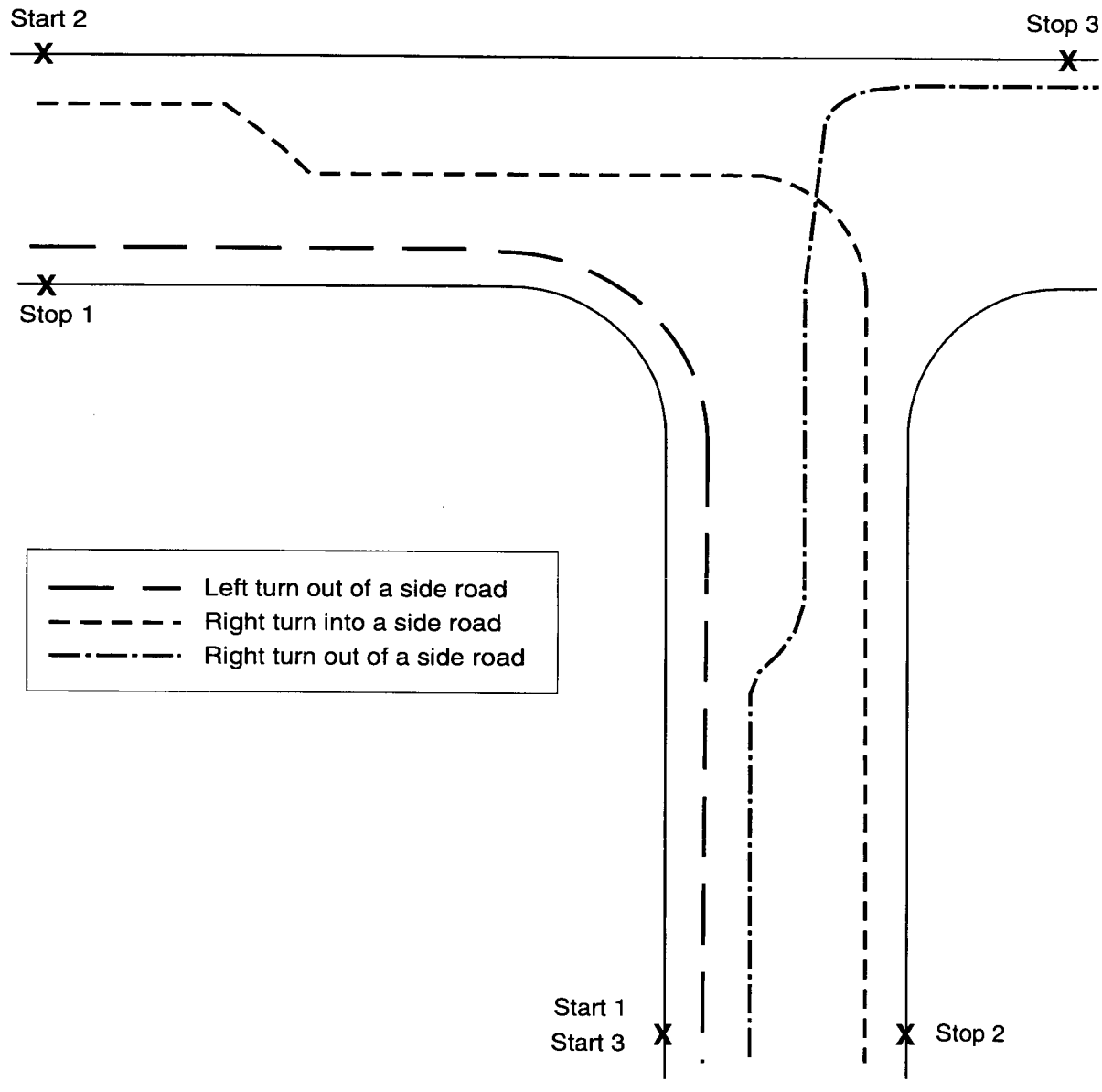
25. At traffic lights, what comes after red?

- ☐ **Amber**
- ☐ **Red and amber together**
- ☐ **Green**

You have now finished the quiz.

THANK YOU VERY MUCH FOR HELPING US.

APPENDIX C: T-JUNCTION TEST



APPENDIX D: ON-ROAD PRACTICAL TEST ASSESSMENT FORM

Transport Research Laboratory

Practical Cycling test of year 8 pupils

Name of candidate:	**PASS (✔)**	
School:	**FAIL (✔)**	

Date	
Time	

Bicycle owned by:	rider	
	TRL	
	other	

Weather	
Fine, dry roads	
Fine, wet roads	
Slight rain	
Heavy rain	
Windy	

Cycle helmet?	Own	
	TRL	
	Refused	

/ = minor mistake, X = major mistake.

Faults on bicycle	
Bike size	
Frame	
Front forks	
Handlebars	
Saddle	
Headset	
Pedals/crank	
Brakes	
Cables	
Wheels	
Tyres	
Chain	

Left turn	
Bad general observation	
No signal before turn	
Going on if traffic near	
Incorrect road position	
Not obeying a traffic sign	
No repeat signal on restart	
No look back on restart	

Right turn Maj-Min	
No look back	
No signal before moving out	
Moving out if traffic near	
No signal while moving out	
Incorrect road position	
Making turn if traffic near	
Bad general observation	
No repeat signal on restart	
Stopping in middle if clear	

Overtaking parked car	
No look back	
No signal before moving out	
Moving out if traffic near	
Incorrect road position	
No signal while moving out	
Bad general observation	

Stopping	
Bad general observation	
No signal	
Using brakes badly	
Wobbling	
Incorrect road position	
Skidding	
Dismounting unsafely	
Parking badly	

Right Turn Min-Maj	
No look back	
No signal before moving out	
Moving out if traffic near	
No signal while moving out	
Incorrect road position	
Not obeying a traffic sign	
Making a turn if traffic is near	
Bad general observation	
No repeat signal on restart	
Too slow	

Style	
Bad riding position	
Bad pedalling	
Any wrong signal	
Poor signal	
Turning while signalling	
Wobbling	
Wrong gears	
Too fast	

Starting off	
No look back	
Starting when traffic near	
Bad general observation	
One-handed start	

General Assessment

Safe A/B	
Unsafe C/D	
Reasons/Comments	

APPENDIX E: FAULTS MADE IN PRACTICAL TEST BY TRAINED AND UNTRAINED CHILDREN

Manoeuvre	% children making fault		Level of significance
	Trained children (Base = 805)	Untrained children (Base = 761)	
Left turn			
No signal before turn	15	27	<0.001
Right turn - major to minor			
No look back	17	36	<0.001
No signal before moving off	17	31	<0.001
No signal while moving out	11	23	<0.001
Incorrect road position	12	24	<0.001
Bad general observation	2	6	<0.001
Stopping in middle if clear	6	2	<0.001
Overtaking parked car			
No signal before moving out	38	61	<0.001
Incorrect road position	26	74	0.005
No signal while moving out	31	69	0.001
Bad general observation	1	3	0.005
Stopping			
Bad general observation	59	83	<0.001
No signal	73	90	<0.001
Incorrect road position	4	10	<0.001
Dismounting unsafely	8	15	<0.001
Right turn minor to major road			
No look back	26	54	<0.001
No signal before moving out	25	38	<0.001
No signal while moving out	20	33	<0.001
Incorrect road position	6	14	<0.001
Bad general observation	5	9	0.001
Style			
Poor signal	3	7	0.001
Turning while signalling	21	31	<0.001
Wobbling	3	6	0.01
Starting			
No look back	41	71	<0.001
One handed start	11	5	<0.001

APPENDIX F: FAULTS MADE BY TYPE OF COURSE

Fault	Percentage of trained children making each fault								
	Mean for all courses	NCPS Intensive Off-road	NCPS Intensive On-road	NCPS Extensive Off-road	NCPS Extensive On-road	Right-track	Oxford	Croydon	Scottish
Bad general observation when stopping	59	73	69	66	54	47	66	36	33
No look back on start	41	60	45	53	41	29	39	8	18
No signal before moving out when overtaking a parked vehicle	38	60	51	40	38	19	31	15	15
No signal while moving out when overtaking a parked vehicle	31	56	29	42	24	26	27	0	0
No look back when turning right minor-major	26	36	37	24	23	17	20	13	15
No signal before moving out when turning right minor-major	25	37	36	29	19	16	16	13	5
No look back when overtaking a parked vehicle	22	34	25	18	24	15	22	0	16
Turning while signalling	21	24	26	32	24	14	19	18	16
No signal while moving out when turning right minor-major	20	34	30	24	12	11	11	3	3
No look back on restart when turning left	18	16	26	37	13	14	14	18	16
No look back when turning right major-minor	17	17	22	24	19	12	14	5	16
No signal before moving on when turning right major-minor	17	27	18	8	19	12	16	10	3
Bad general observation when turning left	15	19	17	5	17	14	13	3	20
No signal before turn when turning left	15	19	16	13	20	11	14	10	10
No repeat signal on restart when turning left	15	11	20	29	16	13	19	15	5
Any wrong signal	12	10	10	8	11	14	0	31	28
No repeat signal on restart when turning right minor-major	12	16	16	11	12	9	7	10	5
Incorrect road position when turning right major-minor	12	16	15	24	8	8	3	21	2
No signal while moving out when turning right major-minor	11	18	13	8	11	7	10	5	3
One handed start	11	12	9	18	6	10	17	13	7
Bad riding position	10	15	13	11	7	8	1	5	13

APPENDIX G: CYCLING EXPOSURE - SUMMARY OF THE DATA

1. Sampling Questionnaire

Reported frequency of trips by bicycle to school

Frequency	Percentage (Base 2387)	
	How often do you ride to a bike to school at this time of year?	How often do you ride to a bike to school in the summer?
Every school day	8	9
Between 2 and 4 times a week	6	6
About once a week	3	2
Less than once a week	4	3
Never	80	80

Reported frequency of other trips by bicycle

Frequency	Percentage (Base 2387)	
	About how many other times do you go out on a bike each week at this time of year?	About how many other times do you go out on a bike each week in the summer?
7 or more times	19	33
Between 2 and 6 times	34	40
About once a week	19	19
Less than once a week	21	7
Never	8	1

2. Cycling logs

The following variables have been computed from summing the information recorded over seven days by the children. The schools were surveyed over a year, and so different schools recorded this information at different times of the year.

Number of days rode a bicycle

Number of Days	Percentage (Base 808)
None	16
One	9
Two	10
Three	16
Four	16
Five	15
Six	10
Seven	8

Total number of trips over seven days

Number of Trips	Percentage (Base 808)
None	16
1 - 5	31
6 - 10	29
11 - 15	12
16 - 20	7
21 - 25	3
26 or more	1

Number of trips to school over seven days

Number of Trips	Percentage (Base 808)
None	85
One	4
Two	2
Three	3
Four	2
Five	3

Number of trips on the road

Number of Trips	Percentage (Base 808)
None	30
1 - 5	43
6 - 10	17
11 - 15	6
16 - 20	2
More than 20	1

Number of trips made alone

Number of Trips	Percentage (Base 808)
None	27
1 - 5	46
6 - 10	20
11 - 15	5
16 - 20	2
More than 20	1

Total amount of time spent cycling over seven days

Amount of time (minutes)	Percentage (Base 808)
None	16
Up to an hour	17
61 to 120 minutes	18
121 to 180 minutes	14
181 to 240 minutes	9
241 to 300 minutes	7
More than five hours	19

MORE INFORMATION

The Transport Research Laboratory has published the following other reports on this area of research:

PR99 The effectiveness of the General Accident Eastern Region Children's Traffic Club. Katie Bryan-Brown. Price Code H.

TRL148 Road safety education and good practice in Hertfordshire. John Sykes, Wendy Broome, Kathleen O'Leary and Gordon Harland. Price Code J.

TRL149 Road safety education and good practice in Sheffield. Margaret Noble, Steve Kenny, Kathleen O'Leary and Gordon Harland. Price Code P.

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