An evaluation of the Lifeskills-Learning for Living programme

Prepared by **the Oxford Evaluation Team**
for the Health and Safety Executive 2003

RESEARCH REPORT 187

HSE
Health & Safety Executive

An evaluation of the Lifeskills-Learning for Living programme

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The 'Lifeskills – Learning for Living' programme uses an interactive hands-on approach to teach safety skills to Year 6 children, aged 10 – 11 years. It aims to improve their awareness of potential dangers, their knowledge, their self-confidence and their performance of safety routines. An evaluation of the programme by a team from Oxford University and Oxford Brookes University, took place from March 2001 to September 2003. It was funded by the Health and Safety Executive and the Department of Health. Five areas of the programme were evaluated - home, fire and road safety, first aid and drugs. A before and after design with matched control groups was used. The evaluation tested children's safety knowledge immediately after their visit to Lifeskills and also three months and 12 months later. Their self-confidence and performance on safety skills were also assessed either at the Lifeskills Centre or at a different site three months after their visit. Three data collection methods were used: a paper and pencil questionnaire, observations of children completing specific tasks and focus group discussions.

This report and the work it describes were funded by the Health and Safety Executive (HSE) and the Department of Health (DoH). Its contents, including any opinions and/or conclusions expressed, are those of the authors alone and do not necessarily reflect HSE policy.

HSE BOOKS

First published 2003

ISBN 0 7176 2794 2

ACKNOWLEDGEMENTS

To all the children and staff from the following schools:

Bath and North East Somerset LEA
Chandag Junior School
Chew Stoke C of E Primary School
Chew Valley Comprehensive School
Newbridge Junior School
St. Mary's R C Primary School
St. Philip's C of E Primary School
St. Stephen's C of E Primary School

Bristol LEA
Avon Primary School
Avonmouth C of E Primary School
Bannerman Road Primary School
Holymead Junior School
Hotwells Primary School
Knowle Park Junior School
Tyning Hengrove Junior School

North Somerset LEA
Churchill C of E Primary School
Kingshill C of E Primary School
Nailsea Comprehensive School
St. Barnabas C of E Primary School
St. Francis R C Primary School
St. Peter's C of E Primary School
Wrington C of E Primary School
Yatton C of E Junior School

South Gloucestershire LEA
Cherry Garden Primary School
Emersons Green Primary School
Filton High School
Filton Hill Primary School
Hanham High School
Longwell Green Primary School
Olveston C of E Primary School
Wellesley Primary School

Independent
Clifton College Preparatory School, Bristol
Clifton High School, Bristol
Kingswood Preparatory School, Bath
Red Maids Junior School, Bristol
Redland High Junior School, Bristol
The Downs School, North Somerset

Schools for Health Co-ordinators
Shaun Cheesman, North Somerset, David Pearson, BaNES
Maggie Sims, South Gloucestershire
Carol Watson, Bristol

We would also like to acknowledge the invaluable help offered to this evaluation by the Lifeskills Staff, Volunteer Guides and Evaluation Steering Group.

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Andy Stainthorpe	Research and Development Manager, Salisbury RDSU
Andy Townsend	Lifeskills Centre Manager

Thanks also to Bristol Water who provided facilities for the off-site observational testing and to Wakefield Carter, Russell Humphrey, Kate Brusten, Emma Tompkins, Charlie Foster and Peter Scarborough for technical assistance, and Graham Smith and Jon Palmer for artwork.

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EXECUTIVE SUMMARY

THE LIFESKILLS PROGRAMME

'Lifeskills - Learning for Living' is a permanent regional safety education and training facility built as a realistic 'village' at the CREATE Centre in Bristol. It is designed to help children (and other members of the community) learn about safety in a fun and practical way. The 'village' has a road, a supermarket, houses featuring realistic bathroom, bedroom, living room and kitchen sets, a garage, garden, electric substation, building site, playground, stream, railway line, farmyard and country lane. Sound effects bring the village to life. The Centre provides children with the opportunity to learn safety skills in a realistic environment and to practise the skills they have learnt. The programme stresses the importance of taking responsibility for personal safety, assessing risks and learning how to cope when faced with dangerous or difficult circumstances.

School visits are primarily tailored to Year 6 children (aged 10-11 years). The Lifeskills programme accommodates a maximum of 40 pupils per session working in small groups (at most four children per group). In each session a group goes round all 10 scenarios with the same trained guide spending 10 minutes on each scenario. Typically therefore 10 trained guides help on each session. All are volunteers. As the children are taken around the 'village', the guides aim to achieve a range of learning objectives in areas including road, home, water, fire and drugs safety. At the end of each visit, every child is given a Lifeskills Detective survey sheet designed to encourage children to take their family on a safety investigation of their own homes. When they return the completed Detective sheets to school, the children are given a certificate to commemorate their visit to Lifeskills.

EXISTING RESEARCH

The Lifeskills programme is one of a growing number of interactive interventions for the prevention of injuries. Despite their increasing popularity little information about the impact of such programmes is available. Currently a safety education centre for children in Maryland, USA provides the only evaluation of a programme of similar design to Lifeskills[i]. The evaluation of the Maryland programme showed that it successfully improved the children's knowledge about some, but not all, safety areas. But the evaluation did not assess whether the children could actually perform the safety routines the programme sets out to teach. Advantages of the Maryland approach were the provision of a distinct site which could deliver the programme to large numbers of children, the teaching of practical skills which could not be readily taught at school and the development of good communications between children and safety departments. The report however noted that the success of the programme was dependent on sufficient resources and support.

A previous in-house evaluation of the Lifeskills programme suggested that visits to the programme were enjoyed, that '*there was a good recall of key messages'* and that '*in the short term, the Lifeskills experience had a positive impact on the children's knowledge'* [ii]. In January 2001, a team of researchers from the University of Oxford and Oxford Brookes University were appointed to undertake a more comprehensive evaluation of the programme. The evaluation took place between March 2001 and September 2003.

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i Gielen, A.C, Dannenber, A.L, Ashburn, N & Kou, J (1996) Teaching safety: evaluation of a children's village in Maryland. Injury Prevention, 2, 26-31

ii Arnoldi, H & Sims, M. (2000) Lifeskills – Learning for Living. Evaluation of the Pilot. Bristol

THE LIFESKILLS EVALUATION

The Oxford evaluation was designed to explore how well the Lifeskills programme achieves its aims. Specifically, the focus of the evaluation was on exploring how well the Lifeskills programme helps the children who visit the Centre to:

- be more alert to potential danger to themselves and others
- know what to do in potentially dangerous situations
- learn practical skills in coping with hazards
- develop self confidence to use these skills to deal with hazards.

Specifically, the evaluation was designed to explore whether children who had been to Lifeskills had acquired safety knowledge and to assess to what extent they remembered this safety knowledge at three months and an average of 12 months after their visit. The evaluation also assessed children's self-confidence and their performance on a range of safety skills three months after their visit, either at the Lifeskills Centre or at a different site.

A Steering Group was set up to guide the evaluation. Research ethics approval for the evaluation was granted by the Ethics Committee of the School of Social Sciences and Law at Oxford Brookes University.

Due to inevitable time restrictions during a school's visit to Lifeskills, it was not possible to evaluate the whole Lifeskills programme. With guidance from the Evaluation Steering Group it was agreed that it was possible to evaluate only about half the programme. Five elements of the programme were chosen by the Evaluation Steering Group for the evaluation – home safety, fire safety, first aid, road safety and drugs.

The first part of the evaluation used a longitudinal (three month) matched samples design. A paper and pencil test which was developed specifically for the project was used to assess children's knowledge and awareness of hazards. The Lifeskills children were tested immediately before and again immediately after experiencing the programme at the Lifeskills Centre. The Control children, none of whom had visited the Centre, were tested in their schools. Children in both groups were given follow-up tests in school three months after the initial testing took place. Children in Year 7 completed the paper and pencil test in school. This testing allowed conclusions to be drawn about the retention of knowledge acquired at Lifeskills over an average 12-month period.

The second part of the evaluation also used a longitudinal (three month) matched samples design. The Lifeskills children were tested immediately before and again immediately after experiencing the programme at the Lifeskills Centre. The Control children, none of whom had visited the Centre, were tested in their schools. As before, children in both groups were given a paper and pencil test but, at three months, they were asked to perform safety skills. This testing took place in two phases. Firstly, in 2001-2002, children were observed performing a range of safety skills at the Lifeskills Centre. Secondly, in 2002-2003, children were observed at a different site - Chew Stoke Pumping Station. This allowed for an assessment to be undertaken of the extent to which the performance of the Lifeskills children had been assisted by circumstantial contextual cues when they were tested where the skills were first learnt.

At three months the Lifeskills and Control children who took part in the observational testing at the Lifeskills Centre also took part in facilitated focus group discussions on safety and risk.

Data collection and analysis methods

The following three methods of data collection were used: a paper and pencil test, observational tests and focus group discussions.

Paper and pencil test

A series of pictorial tests were developed especially for the evaluation and took various forms. For example, for fire safety, children selected four drawings from eight that depicted the correct set of actions to take on discovering a fire had broken out. For room safety, the children drew a circle around each potential hazard they noticed in a picture of a kitchen. More than 100 children were involved in the development and piloting of these tests.

In the final version, there were 10 items covering the five nominated elements:

Home safety:

- knowing what to do in the event of a gas leak
- knowing what not to do in the event of a gas leak
- noticing kitchen hazards

Fire safety:

- knowing what to do in the event of a fire
- noticing fire hazards in a bedroom

First aid:

- recognising the Recovery Position

Road safety:

- understanding the safe use of seat belts
- recognising that pedestrians without reflective clothing may not be visibile to car drivers in darkness or fading light,
- knowing where a car would stop if it braked hard at 30 mph

Drugs knowledge:

- knowing the correct classification of various drugs

The children were also asked three questions about their confidence in dealing with emergencies.

The paper and pencil test was administered twice to Lifeskills children (N = 691) at the Lifeskills Centre, once before they were taken round the 10 scenarios, and once after they had been round. The test took up to 12 minutes to fill in. After going round Lifeskills, the children were asked additional questions about which of the scenarios they had enjoyed most. They were also asked which scenario they had visited last as this revealed the order in which they had visited the scenarios. These children completed the paper and pencil test again at school approximately three months after their visit to the Centre (N = 558).

Children in the Control group acted as a matched comparison for the Lifeskills Group so that any effects of practice or maturation could be estimated. None of them had visited Lifeskills when they took the test. They completed the paper and pencil test at school. In order to mimic the test conditions of the Lifeskills group, the Control group children (N = 200) initially completed the test twice on the same day, separated by a gap of approximately two hours. They also filled in the test for a third time, again at school, approximately three months after they first took the test (N = 169). All of these children made a school visit to Lifeskills after the three month follow-up test.

Year 7 children completed the paper and pencil test once, in the spring term of 2003 (Lifeskills N = 383; Control N = 236). In three of the schools, after a general explanation had been given in

assembly, children completed the questionnaire in class-time under the supervision of their teachers.

Observational tests

These tests involved observation of the children's performance on some of the skills covered in the Lifeskills programme. Each child was tested individually. Due to constraints of time and space, it was not possible to observe children's performance on all the elements assessed with the paper and pencil test.

The skills selected for observational assessment were:

Home safety
- dealing with a gas leak
- arranging a kitchen so that it was safe for a toddler

Fire safety:
- carrying out a fire escape plan

Road safety:
- demonstrating where a car would stop if it braked hard at 30 mph

First aid
- placing someone in the Recovery Position
- helping someone in difficulties in a river

These tests were chosen because they all involved the child in actively carrying out tasks. Thirty five children helped with the development and piloting of the observational tests.

The observational tests of performance took place three months after the initial paper and pencil testing. On arrival the class of children gathered in a large reception room. At the Lifeskills Centre three children were tested at a time. Each child started in a different sector and was tested individually. Children progressed from sector to sector in a set order with five minutes allocated to each sector. A bell was sounded at five minute intervals to alert the guides to move between testing sectors. Each child was accompanied by two adults. One was an experienced guide from the regular Lifeskills team. The second was a trained assessor from the Oxford team. The guide took the child through the scenarios and conducted the assessment. After the 15 minutes of testing the three children were taken to a different part of the building to avoid their discussing the test with children who had not yet been tested. A total of 96 Lifeskills children and 48 Control children took part in these observational tests. When observational tests were conducted at Chew Stoke Pumping Station, it was possible to test six children individually at one time. In every other respect the testing procedure was identical. A total of 148 Lifeskills children and 46 Control children took part in the tests at Chew Stoke Pumping Station.

Statistical analysis used two kinds of data collected from both the paper and pencil test and the observational test. The first kind of analysis was a comparison of the numbers of children in the Control and Lifeskills groups who were correct on all features in a given scenario (referred to as perfect achievement). The second type of analysis compared the mean average scores of the children in the Control and Lifeskills groups on the number of features correct for each scenario in turn.

Focus group discussions

A pilot focus group session checked the interview questions, and the procedures for managing the group and data recording. Focus group discussions were held either at the Lifeskills Centre or at

children's schools. The groups were primarily conducted by one interviewer, although there were always two interviewers present.

Thirty five focus groups of six children took place after observational testing at Lifeskills. Every group contained both girls and boys. In these focus groups, children sat in a separate room away from the observational testing, on chairs arranged in a semi-circle. In each case, the interviewer sat facing the children. The discussions were both video-recorded and audio-recorded. The purpose of this was explained to the children. Each discussion lasted half an hour. The length of time spent covering each question varied according to the way the discussion developed.

For Lifeskills children, the schedule focused on what they had liked and disliked about their visit to Lifeskills and also on their perceptions of risk and safety. Half these focus groups were also asked about the Lifeskills Detective sheet (a check-list of safety features at home which is given to all children after their school visit to Lifeskills). In the other groups, the children were shown a line-drawing of one male and two female adolescents with drinks in their hands. A caption states that the boy has just offered one of the girls some pills. This was used to trigger discussion about drugs. Control group children who had not attended the Lifeskills programme discussed their perceptions of risk and safety, and of drugs, using the line-drawing shown to the Lifeskills children.

Because undertaking the observational tests could have influenced the content of discussion in the focus groups, two schools involved in the evaluation were requested to host discussion groups in school. None of the children in these groups had been to Lifeskills or taken part in any of the evaluation's tests. Eight of these focus groups were held in school. Children were allocated by their teachers to mixed-gender groups containing between five and seven children. Children sat in a separate area away from their classroom on chairs arranged in a semi-circle. In each case, the interviewer sat facing the children. The discussions were audio-recorded. The purpose of this was explained to the children. Each discussion lasted twenty minutes and focused on the children's *p*erceptions of risk and safety and their ideas about drugs. The length of time spent covering each question varied according to the way the discussion developed.

The discussions were transcribed, and the transcripts were coded and analysed for common themes (e.g. similar recurrent features found in different children's descriptions of what they had liked about Lifeskills or found in different children's perceptions of risk).

Recruitment of participants

Eighty-nine schools booked to visit the Lifeskills programme between December 2001 and July 2002 were invited by letter to take part in the evaluation. Seventy of these schools were invited to take part in the Lifeskills Group, of which 19 accepted. Fourteen of these schools were from the state sector and five were from the independent sector. Nineteen schools scheduled to visit the Lifeskills Centre in the summer term of 2002 were invited to take part in the Control group. Seven of these schools accepted. Six were from the state sector and one from the independent sector. Children from these Control schools visited the Lifeskills Centre only after they had completed the written tests at school three times. Since only one independent school invited to participate in the Control group accepted, it was decided that the data from the independent schools would be excluded from the analyses because all Lifeskills/Control comparisons for the independent schools would have had to be based on the performance of only a single Control school.

The majority of these schools were tested only using the paper and pencil test. Four schools (two higher achieving, two lower achieving) from the Lifeskills Group and two schools (one higher and one lower achieving) from the Control Group were asked to participate in the observational test and discussion groups at the Lifeskills Centre at three months. All agreed to participate.

Care was taken to match the Lifeskills group and the Control group. The primary criterion on which the state schools were matched was academic achievement. The records for 2001 were used to categorise the state schools as 'higher achieving' if the school achieved an average key stage 2 SATs score of equal to or above the national average for primary schools in England or as 'lower achieving' if the school achieved an average key stage 2 SATs score of less than the national average in the previous school year. There were equal proportions of higher and lower achieving state schools in the Lifeskills and Control groups. In the event one of the higher achieving schools functioned as the pilot group for the observational tests.

Seven primary schools were invited by letter to participate in the observational tests at Chew Stoke Pumping Station. Selection of the schools was made according to the date of the planned Year 6 Lifeskills visit for each school, the achievement level of the school and the school's geographical proximity to Chew Stoke Pumping Station. Of these schools the two (one higher and one lower achieving) due to attend the Lifeskills Programme after the planned observational test dates in spring 2003 were invited to be the Control Group. One higher achieving school agreed to be the pilot for the observational tests, and the other four schools became the Lifeskills Group. All schools were located within a half hour coach journey from the Pumping Station.

In addition, four secondary schools were invited by letter to participate in the Year 7 paper and pencil test. Selection of the schools was made according to the achievement level of the school, co-education, a spread of schools between the four Local Education Authorities covered by the Lifeskills catchment and evidence that some Year 7 children had attended the Lifeskills programme in Year 6. Recruitment of these schools was assisted by the involvement of Schools for Health Co-ordinators for the four relevant LEAs– Bristol, Bath and North East Somerset, South Gloucestershire, and North Somerset. All four schools agreed to participate.

Results

The Year 6 data showed that, three months after a visit to Lifeskills, children were more knowledgeable and performed better than the Control children in all areas studied (Home safety, Fire safety, First aid, Road safety, and Drugs), and on all tests in these areas, except for two of the three Road safety tests - seat belt and pedestrian visibility A year later, in Year 7, the Lifeskills children were still more knowledgeable about Home safety, Fire safety and Road safety although not on as many tests as they were previously. The Lifeskills children were no longer more knowledgeable than the Control children about First Aid and Drugs.

The children's confidence in dealing with emergencies was assessed by how quickly they started to act on the performance tests and by their response to direct questions about their confidence on the paper and pencil tests. The Lifeskills children were more confident than the Control children on both measures. Their confidence, as measured by speed of reaction, was entirely appropriate since the Lifeskills children who were quicker to react were the ones who performed the task better.

Home safety

The Lifeskills programme is doing well at teaching children what to do in the event of a gas leak. On all measures, at three months after their visit, children in the Lifeskills group did significantly

better statistically than children in the Control group.[1] The Lifeskills children were better than the Control children at using the landline/house telephone to report a gas emergency (and stating that a mobile phone should not be used near a gas leak), opening a window and turning off the gas at the mains. The Lifeskills children claimed more confidence than the Control group children in response to the direct paper and pencil test question about knowing what to do in the event of a gas leak. On the observational test however the Lifeskills children were no more confident than the Control group, judged by the hesitation displayed before beginning to act.

Although the Lifeskills programme is improving children's performance and knowledge about what to do if there is a gas leak the absolute levels attained were not high. There was little sign that Lifeskills is teaching children who do not already know about the danger of switching electrical appliances on or off during a gas leak. Although Lifeskills is teaching children about the dangers of using a mobile phone near a gas leak, only 29% of the Lifeskills children in the observational test mentioned not using a mobile when asked about things one should never do in the event of a gas leak. Furthermore 12% of Lifeskills children did actually use the available mobile rather than the landline when phoning for assistance.

On the paper and pencil test requiring them to spot hazards in a kitchen Lifeskills children did better than the Control group children. The Lifeskills children spotted more hazards than the Control group children, in particular by recognising that chemical substances such as bleach could pose a danger. Nevertheless the focus group discussions showed that the Control group children were as aware of the dangers everyday items can pose for younger children. On the performance test, both groups did very well. Both groups were equally confident about performance on this task, as measured by how quickly they began to act. But in the Lifeskills group the more confident children were the better at the task. This was not the case in the Control group.

Fire safety

When performing a fire escape routine the Lifeskills children were better than the Control group children at shutting the door to the fire, getting down low while leaving the house and giving details of their location and phone number in the course of a 999 phone call. Lifeskills children hardly ever entered the room to investigate the fire, whereas approximately a third of the Control children did. When constructing an escape plan on the paper and pencil test the Lifeskills children were more likely than the Control children to include 'shouting fire', and were less likely to include 'collecting a pet'.

The Lifeskills children claimed more confidence than the Control group children in response to the direct paper and pencil test question about knowing what to do in the event of a fire. On the observational test the Lifeskills children were also more confident than the Control group, judged by the hesitation displayed before beginning to act. Furthermore the Lifeskills children who were least hesitant performed the best. Among the Control group children in contrast the more confident children were not necessarily the ones who performed better.

While the Lifeskills programme was clearly improving children's fire escape skills and knowledge the absolute levels of attainment were not high. Lifeskills children did include

[1] Hereafter the terms 'significant' and 'significantly' will mean statistically significant and statistically significantly at the 0.01 level of statistical significance. The 0.01 level rather than the 0.05 level was chosen to avoid random Type 1 error due to the large number of tests.

'shouting fire' in their escape plan in the paper and pencil test, but only 17% of them shouted 'fire' in the performance test. Although nearly all the Lifeskills children used the phone to make an emergency call, when tested off-site 60% of the Lifeskills children made the phone call from inside the building.

Fire safety knowledge was also assessed with a paper and pencil test in which the children were asked to spot the fire hazards in a picture of a bedroom. Lifeskills children did significantly better than Control group children. Lifeskills children recognised that a vase of flowers on top of a TV set could pose a hazard. Half the Lifeskills children circled the vase whereas only 11% of the Control children did.

Road safety

The Lifeskills programme is very successful at teaching children about car stopping distance. On all measures, at three months after their visit, children in the Lifeskills group did significantly better than children in the Control group, and the differences between the Lifeskills and the Control groups were large. Lifeskills children were significantly less hesitant than Control group children when indicating where a braking car would stop. The more confident Lifeskills children were the ones who did best on the task.

On the paper and pencil test of seat belt knowledge all the children recognised that travelling in a car without wearing a seat belt is unsafe. Approximately half the children knew the 'one person, one belt' rule, but this number was not improved by the Lifeskills programme.

On the questions about pedestrian visibility nearly all the children tested recognised that in complete darkness a car driver may not be able to see a pedestrian who is not wearing reflective clothing. Two thirds recognised that the car driver would have similar problems in partial darkness, and one third recognised that the car driver would have similar problems in fading light. These numbers were not improved by the Lifeskills programme.

First aid

The results for first aid were very different on the performance and knowledge tests. The knowledge task was a test of recognition of the Recovery Position in which the child had to choose which of four pictures was correct. Ninety four per cent of Lifeskills children selected the correct picture three months after instruction. In the Control group children who did not already know the Recovery Position believed that it was safe to leave a person on their back and with their head propped up. Hardly any Lifeskills children made this mistake.

In the performance test children were required to place an "injured" child in a safe position. Very few children could do this adequately although the Lifeskills children outperformed the Control children. In particular they had learned that it is important to place the person on their side but the other manoeuvres involved in placing someone in the Recovery Position were poorly learned. The moves involved in the Recovery Position are easy to confuse with one another and are unlikely to be familiar to the children. The unfamiliarity, complexity and potential for confusion of the elements of the Recovery Position routine may explain why it is less successfully learned by the children than the gas and fire routines.

Lifeskills children were significantly more confident than Control group children when beginning the Recovery Position routine. The more confident children from both groups were the ones who did best on the task. When asked whether the position into which they had moved the "injured"

person was correct the Lifeskills children were less able than the Control group children to recognise when they were wrong.

Very few children could adequately act out how they would react if they came across a person in trouble in a river. Nevertheless the Lifeskills children outperformed the Control children. In particular they had learned not to go into the water themselves and to throw in an object to help the person float. The absolute level of the Lifeskills' children's performance was not high. They had learned to reach out with a suitable object such as an umbrella, but they were likely to do so while standing up rather than lying down. As with the Recovery Position the fact that the right and wrong ways of doing an act could so easily be confused may have accounted for the children's relatively poor scores.

Lifeskills children were significantly more confident than Control group children when beginning to act out what they would do to help someone struggling in a river. The more confident Lifeskills children were the ones who did best on the task.

Drugs

Three months after their visit, Lifeskills children classified drugs better than Control children. The main difference between the groups was that the Lifeskills children had learned to classify coffee in particular as a legal and widely used drug.

All children in the evaluation seemed well-informed about other drugs, legal and illegal, and were able to classify them correctly. In the focus group discussions many children seemed to know something about illegal drugs as well as the health risks of alcohol and cigarettes. The children also demonstrated that they understood the importance and subtle effects of peer pressure. The need to 'be cool', to impress and to be popular and the negative consequences of teasing, bullying or not 'fitting in' were clearly described. This recognition, however, is not sufficient to protect them against such pressure.

DISCUSSION AND RECOMMENDATIONS

Dealing with emergencies

The children's ability to deal with emergencies was assessed in the Fire, Gas, Water and First Aid/Recovery Position tasks, all of which were tested with role-playing performance measures. The Lifeskills children scored better than the Control children on all these tasks.

Skill acquisition was clearly variable. Some messages were learned better than others. The elements of the fire escape routine that were well-learned have all the features of an easily remembered sequential routine. For such routines, psychological research suggests that skill acquisition depends upon 1) the familiarity of the elements, 2) the distinctness of the elements, and 3) their organisation into a clear sequence[v]. In addition sequences are easiest to remember if their elements are associated with real or hypothetical spatial locations[vi].

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[v] Rosenbaum D A, Carlson R A & Gilmore R O (2001) Acquisition of intellectual and perceptual-motor skills. *Annual Review of Psychology,* 52, 453-70

[vi] Luria A R (1968) *The Mind of a Mnemonist*, New York: Basic Books

We recommend that Lifeskills consider teaching gas and water safety more clearly as routines, i.e. articulated sequences of actions. Furthermore, the elements in the routines may be better learned if they are themselves more distinct from each other. In the gas scenario, children may do better at learning not to switch off electrical appliances if they are not taught to switch off the gas at the mains. In the water scenario, Lifeskills could consider making the body position when reaching out a more important aspect of the instruction. In the case of the Recovery Position the one element of the sequence which was learned was rolling the person onto his/her side. This element is familiar and highly distinct from other elements in the procedure. The other elements, in contrast, are unfamiliar and not distinct from each other. The routine will therefore be intrinsically difficult to learn and perhaps cannot be taught without more time and repetition.

Specific recommendations

Fire

- Reinforce messages about shouting 'fire', using an outside phone to make an emergency call, and not rescuing pets

Gas

- Reinforce messages about dangerous actions
  i.e. emphasize not switching electrical appliances on or and not using a mobile in the house when there is a gas leak
- Consider organising the elements of the routine into a more clearly articulated sequence

Water

- Reinforce message about kneeling or lying down, and ***not*** standing up, while reaching out to someone in difficulty
- Consider organising the elements of the routine into a more clearly articulated sequence

First aid

- Consider whether the full Recovery Position is too complex to be taught to children of this age unless more time is available for instruction

Knowledge of preventive measures

The children's knowledge about preventive measures was tested on three aspects of Road safety, viz car stopping distance, correct use of seat belts, and pedestrian visibility to drivers. The Lifeskills programme was very successful in teaching children about car stopping distance. In contrast, the Lifeskills programme had little impact on improving children's knowledge of the appropriate use of seat belts or the visibility of pedestrians without reflective clothing in darkness and fading light.

Specific recommendations

Road safety

- Emphasize the accident risk to car occupants as well as to pedestrians – and the need for one seat belt per person
- Consider making seat belt instruction more interactive
- Make the pedestrian visibility message more vivid and/or spend more time on it

- Consider introducing more interactive instruction to alert children to how difficult it frequently is for pedestrians to be seen by drivers.

Noticing and dealing with hazards

The children's ability to notice hazards was assessed on the paper and pencil tests of the Kitchen and Bedroom scenarios. The Lifeskills children did perform at a significantly higher level than the Control children, but the differences between the two groups were small, with Lifeskills children noticing just one hazard (or less) more than the Control group children. In the case of the Bedroom this was because very little new knowledge was being acquired. In the case of the Kitchen this was because all the children were knowledgeable whether or not they had been to Lifeskills. Their mastery of this task was still more evident on the performance test where there was no difference between Lifeskills and Control group children's ability to rearrange the kitchen to make it safe for a toddler. Both groups did extremely well.

The comments in the focus groups about household hazards for toddlers underlined the fact that most Year 6 children already have the capacity to deal successfully with the set of hazards currently taught in the Lifeskills Programme.

Another scenario in the Lifeskills programme designed to alert children to potential risk is the Drugs classification task. At three months post-intervention, Lifeskills children demonstrated better learning than the Control children by recognising that substances in everyday use such as coffee and alcohol are legal drugs. It is clear that children already know about medicines and illegal drugs before they visit the Lifeskills Centre. Their discussion of drugs-related issues in the focus groups revealed that the children were aware of some of the dangers of drugs and were conscious of the potential power of peer influence. Such awareness does not of course imply a corresponding ability to deal with or resist peer pressure. Effective drugs education programmes include training in assertiveness and refusal skills[iv].

Specific recommendations

Bedroom

- In the bedroom scenario, continue reinforcing the message about the danger of water in a container on electrical appliances. It is the one message that is being learned in this scenario but only 50% of Lifeskills children are currently learning it.

Kitchen

- Give some thought to the kitchen scenario since children appear to have little left to learn about the hazards currently displayed in this scenario. In addition, less time might be spent on kitchen hazards and more time on gas safety issues (since they are taught in the same location and time slot, one after the other).

Drugs

- Consider refocusing the drugs activity to include an emphasis on the health hazards of smoking and alcohol and on the skills children need to resist peer pressure. Such skills have value in a variety of risk areas for adolescents.

[iv] White D & Pitts M (1998) Educating young people about drugs: a systematic review. *Addiction*, 93 (10), 1475-1487

CONCLUSIONS

The current evaluation of Lifeskills focused on the impact that the programme has on children's ability to notice the presence of hazards and their knowledge about preventive measures, plus their skill and self-confidence at dealing with emergencies.

Three months after a visit to Lifeskills children were more knowledgeable and performed better than the Control children in all areas studied (Home safety, Fire safety, First aid, Road safety, and Drugs), and on all tests except for two of the Road safety tests. A year later the Lifeskills children were still more knowledgeable about Home safety, Fire safety and Road safety but they were no longer more knowledgeable than the Control group children about First Aid and Drugs.

The children's confidence in dealing with emergencies was assessed by how quickly they started to act in the performance tests and by their response to direct questions about their confidence in the paper and pencil tests. The Lifeskills children were more confident than the Control children on both measures. Their confidence, as measured by speed of reaction, was appropriate since the Lifeskills children who were quicker to react were the ones who performed the task better.

The results of the evaluation can be viewed with confidence for a variety of reasons. A quasi-experimental design was employed, involving matched control groups and pre- and post-intervention measures. The evaluation was based on both performance and knowledge measures. The performance measures were taken in two locations to see whether the skills children had acquired generalised beyond the setting in which they were originally learned.

In the evaluation the differences between the Lifeskills group and the Control group were often statistically significant when the levels of performance of the two groups were not very different at all, e.g. only a slightly higher percentage of Lifeskills children succeeded on a task or the Lifeskills children succeeded on average in performing only one more element of a multi-element routine or the Lifeskills children spotted on average only one more of the seven hazards shown in a picture of a room. Such small differences point up the fact that in many cases the Lifeskills experience was having only a small effect on the children's knowledge and performance.

In fact such small effects are the norm in educational interventions with children. It is therefore encouraging that many of the effects found in the current evaluation were not small, and compare favourably with effect sizes found in the evaluation of other interventions. The majority of these relatively larger effects were found on the performance measures rather than the knowledge measures. This suggests that the Lifeskills programme somewhat improves children's safety knowledge but has more impact on children's capacity to act on their knowledge. Since the Lifeskills children were more confident than the Control group children and the more confident among the Lifeskills children performed best it may be the extra confidence instilled by Lifeskills that is responsible for the fact that the improvements in performance were more marked than the improvements in knowledge.

Taken as a whole the results of the current evaluation strongly suggest that, although there are areas in need of improvement, the Lifeskills programme is succeeding admirably in improving children's knowledge and, more strikingly, their self-confidence and capacity to put what they know into effect. The results imply that Lifeskills' own interactive safety skills programme can achieve Lifeskills' stated aim of bridging the gap between knowledge and performance. They perhaps also imply that other programmes that use vivid and realistic sets as a backdrop for similar interactive small group teaching methods may be able to enjoy equal success.

A limitation of the current evaluation is that due to time constraints during school visits, only half of Lifeskills' scenarios could be assessed. Thus it is not possible to comment on children's acquisition of skill and knowledge in the other safety areas the programme sets out to cover. Also of course the performance measures involved role-playing rather than observing the children dealing with genuinely hazardous or life-threatening events. Nevertheless these role-playing performance tasks are a fuller test of the children's successful acquisition of safety skills than the paper and pencil tests in the current evaluation or the measures used in some other evaluations which rely solely on the opinions of users of an intervention to assess the intervention's effectiveness. The performance tests in the current evaluation require the children to "do" rather than merely to "say" what they would or should do. They are therefore likely to be better predictors of children's responses in a real-life emergency[iii].

[iii] Warda L, Tenenbein M & Moffatt M E K (1999) House fire injury prevention update. Part 11. A review of the effectiveness of preventive interventions. *Injury Prevention*, 5, 217-225

1. BACKGROUND

1.1 ACCIDENT PREVENTION

The Health of the Nation white paper established accident prevention as a Key Area[1]. This priority continued in the more recent Saving Lives: Our Healthier Nation which set a target to reduce the death rates from accidents by at least one fifth and to reduce the rate of serious injury from accidents by at least one tenth by 2010[2].

Accidents are the commonest cause of death in children under 15 years and every year accidents also leave many thousands permanently disabled or disfigured[3]. Each year in the UK about 600 children die in accidents and 10,000 are left with disabilities. Around half of all accidental deaths of children under 15 involve a motor vehicle whilst other main causes include drowning, fire, suffocation and falls, many of which happen in the home. Further, around 1.2 million children are injured outside their homes each year in parks, fairs, playgrounds, on the street, using sports facilities and in educational settings[4]. Accidents disproportionately affect children in deprived communities, especially those living in temporary accommodation [5, 6]. Government accident prevention initiatives have included the Road Safety in Schools programme and the Safer Travel to School initiative led by the Department of Environment, Transport and the Regions and the LASER Project (Learning about Safety by Experiencing Risk) undertaken by RoSPA for the Department of Health. This latter project aimed to audit existing safety education schemes throughout England and develop good practice guidelines and common evaluation methods.

1.2 CHILDHOOD INJURY PREVENTION INTERVENTIONS

Concern about accidents and their prevention have a long history. Systematic reviews of childhood injury prevention show that interventions can be categorised according to where injury occurs: road, home or leisure environments. Community-based interventions form a more recent category, which target vulnerable social groups [6, 7, 8]. The reviews reveal some common themes:

- multi-factorial prevention is important – education, environmental modification and legislation all play a part [6, 9]
- healthy alliances allow a variety of approaches to complement, develop and reinforce one another [6, 10, 11, 12]
- educational interventions must be appropriate to the target group [6, 13]
- educational interventions need message limitation and reinforcement for effectiveness [6, 8, 10]
- interactive educational interventions are more effective than those taking didactic approaches [6, 14]
- much educational intervention research is limited by poor design and data gathering, often caused by practical and resource difficulties [6-8, 11, 15-17]

Traditionally, mass media health education interventions have disseminated information to the public via public broadcasts, posters and written leaflets. With time, it has become apparent that knowledge by itself is rarely sufficient to change behaviour. A person must also want to change, acquire the skills to do so and have the confidence to use these skills [18]. Not surprisingly therefore, interventions addressing this range of skills are more successful than interventions focusing on knowledge alone [19]. The Lifeskills – Learning for Living Programme based at the Regional Safety Centre in Bristol, is one of a growing number of interactive interventions for the prevention of general injuries [6, 7].

1.3 INTERACTIVE EDUCATIONAL APPROACHES

There are strong theoretical reasons for interactive interventions such as the 'Lifeskills – Learning for Living' programme being more effective than simpler didactic educational interventions. Firstly, research in the psychology of education emphasises the importance of participant interest and 'excitement' in all forms of learning and has shown that those who are involved in this way are more likely to attend to, digest and remember new information [20]. Well-designed interactive environments are inherently stimulating and make the learner open to new information [21, 22] and can alert participants to dangers [23]. Practice of these skills in a role-playing context encourages change of attitude [24] and memory for new information [25]. Despite the persuasiveness of the theoretical arguments in favour of interactive interventions, empirical work is still required for proper evaluation.

1.4 PREVIOUS RESEARCH ON SAFETY EDUCATION CENTRES

Research examining the effectiveness of mass media or general training programmes is limited. Schools have been identified as useful environments for delivering large-scale safety training to children, but such programmes often lack evaluation and development within their design [17]. Where schools themselves have delivered programmes competing educational priorities and variations in programme delivery have proved compromising to success [26]. There have been many evaluations of interventions designed to improve children's knowledge and skill in specific health and safety areas such as road crossing[27, 28, 29], fire response behaviour[30, 31], and dealing with potentially dangerous litter (such as hypodermic syringes)[32] and other substances[33]. Some interventions have relied solely on informal feedback, e.g. from teachers and parents; others have attempted to be more systematic in assessing knowledge acquired and observing the performance of relevant new skills, sometimes in simulated settings with a considerable degree of realism. Not all interventions have utilised control groups, and the post-intervention assessments of knowledge and/or behaviour change have been over very variable lengths of time.

Currently, a safety education centre for children in Maryland, USA, provides the only evaluation of a programme of similar design to Lifeskills [34]. The Maryland 'Children's Village' consists of a building with model roads and businesses, traffic lights and signs, and a home destroyed by fire. Children aged 7-8 make a two-day visit as part of the school curriculum. Activities involve classroom teaching and educational videos, hands-on models and simulations, a visit to a fire-damaged 'home', and child-sized vehicles to drive through the Village. Instructors are fire officers, safety officers or volunteers. Children take home fire safety information for parents. Evaluation questionnaire results showed that children's knowledge improved significantly from 58% to 78% in one intervention group, and from 74% to 85% in another. At pre-test, children were found to be knowledgeable about dangerous items such as matches and lighters, 'stop, drop and roll' fire techniques, wearing a lifejacket and bike riding rules. Post-intervention scores four showed that the children's knowledge had improved in some areas such as the placement of heaters and knowing where it is safe to cross a street, but not others such as how to conduct an emergency service phone call.

The Maryland 'Children's Village' research identified the following advantages of this approach:

- a distinct site enables the delivery of the programme to large numbers of children in the community
- the programme teaches practical skills which could not readily be taught in school
- a safety centre may be more efficient in fostering communication between children and fire/police departments

The research also identified potential problems:

- the success of the programme is dependent on sufficient support and commitment of resources
- it is difficult to establish the effects of the programme on injury prevention statistics

1.5 THE CURRENT EVALUATION

The current evaluation of the Lifeskills programme went further than the Maryland research in three ways:

- it examined not only knowledge post-intervention but also children's capacity to carry out safety routines
- it incorporated matched control groups in the analysis
- it attempted an assessment of children's knowledge retention 12 months after their visit to Lifeskills as well as immediately their visit to Lifeskills and three months later.

'Lifeskills - Learning for Living' is a permanent regional safety education and training centre built as a realistic 'village' on the 4th floor of The CREATE Centre in Bristol. It is designed to help children and other members of the community learn about safety in a fun and practical way.

2. THE LIFESKILLS PROGRAMME

2.1 THE LIFESKILLS PROGRAMME

The Lifeskills programme aims to bridge the gap between knowledge and behaviour and uses an interactive and 'hands-on' approach. The ‘village’ has a road, a supermarket, houses featuring realistic bathroom, bedroom, living room and kitchen sets, a garage, garden, electric substation, building site, playground, stream, railway line, farmyard and country lane (see Table 1 and Figure 1). Sound effects bring the village to life. The Centre is an environment where children are given the opportunity to learn about safety skills in a realistic way, to test their knowledge and practise the skills they have learnt. The programme stresses the importance of children taking personal responsibility for their own safety, assessing risks and learning how to cope when faced with dangerous or difficult circumstances.

School visits are pre-arranged and are primarily tailored to Year 6 pupils (aged 10-11 years), but exceptions are made for schools with joint Year 5/Year 6 classes. Lifeskills accommodates a maximum of 40 pupils per session working in small groups (four maximum) with a Volunteer Guide who takes a group around the 10 scenarios, spending 10 minutes on each scenario. This necessitates the attendance of 10 Volunteer Guides per session. Sessions run from 10am-12noon and from 1pm-3pm daily. The Lifeskills programme uses a standard protocol to which schools comply, to cover both health and safety and the operational efficiency for both pupils and volunteers.

As the children are taken around the ‘village’, the Volunteer Guides aim to achieve the learning objectives shown in Table 1. The teachers answer the emergency telephone calls made by the children. The Volunteer Guides stay with the children and provide continuity links between scenarios.

2.2 LIFESKILLS MANAGEMENT

The management of Lifeskills is carried out by three full-time and one part-time members of staff and by a team of Volunteer Guides recruited from across the community from a wide range of backgrounds. Lifeskills has an on-going programme of volunteer recruitment, which also concentrates on training and retention. Following the training programme, Guides are each provided with an information booklet to support them in their work. In addition a series of topic resource folders are held at the Centre, providing additional information. Commitment varies from one day a month to two days a week, which can be in half-day sessions. All Volunteer Guides undergo a formal training programme, with regular refresher training held throughout the year. A small number act as ‘Trainer Guides’ who, in addition to the initial training, have the extra responsibility of monitoring and offering guidance and advice together with support training to all remaining Guides.

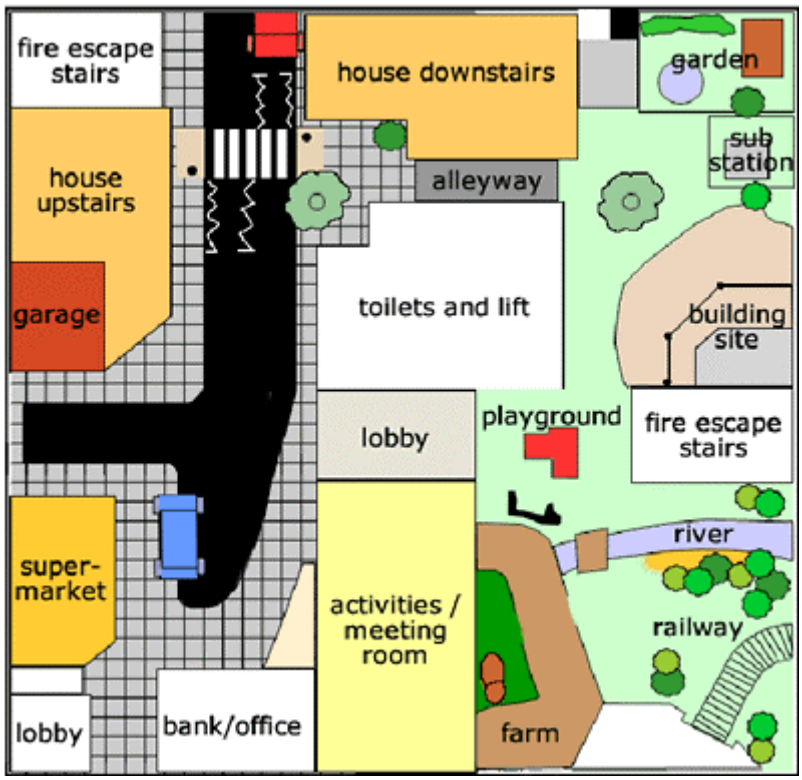
Lifeskills is a registered charity (1080747) and has the full support of head teachers, local councils, primary care trusts, the emergency services and other key agencies. Lifeskills also presents an opportunity for businesses and organisations operating in the region and beyond to become partners in a high profile community project and many have already made contributions or pledged their support.

Lifeskills considers that safety education belongs in the whole curriculum and a visit to the Lifeskills programme supports and complements this work. One of the aims of Lifeskills is that the pupils will be able to translate the skills they have learnt during their visit to real life situations. At the end of each visit, each child is given a Lifeskills Detective investigation survey sheet designed to encourage children to take their family on a home safety investigation. Upon returning the completed Detective sheets to school, the children are given a certificate to commemorate their visit to Lifeskills.

Table 1: Learning objectives for each 'village' scenario

Urban road	• have developed a realistic understanding of speed and stopping distances • be aware of the implications of not wearing a seat belt • have developed a greater awareness as a road user
Shop	• have an awareness of the law regarding the sale of some products e.g. solvents, cigarettes, lighter fuel, lottery cards, alcohol, fireworks to people under age • have an awareness of the significance of labels on food products i.e. ingredients, 'use by' and 'best before' dates
Garage	• have an awareness of the importance of the safe storage of harmful household substances • have an awareness and understanding of drugs that help and drugs that can harm • be able to identify safe adults from whom you can accept medicines
House set 1 (Bathroom, Bedroom, Games room)	• be aware of potential dangers in the bathroom: poisoning, drowning, scalds & trips • be aware of potential fire hazards in the bedroom: smoking materials, candles & aerosols • understand the importance of fitting & testing smoke alarms • faced by a mock fire to be able to develop a fire escape plan, and make a 999 emergency call to the Fire Brigade
House set 2 (Lounge, Hall)	• be able to identify the dangers portrayed in these rooms • understand why the dangers are hazardous • be able to explain how to make the room safer • know what to do when a stranger comes to the door
House set 2 (Kitchen, Dining)	• be able to identify specific hazards in the kitchen and dining room • be able to recognise the smell of gas and be clear about what action to take in the event of a "leak" • be able to make a telephone call to a utility (TRANSCO)
Garden, Electricity sub-station, Building site	• be aware of common dangers in the garden • have an awareness of the dangers of electrical apparatus in the home and the community and the potential for electrocution • be aware that building sites are potentially hazardous places of work where special rules apply and that they are unsuitable places for children
Playground	• be aware of what action to take when finding an injured or unconscious person • be aware of the "Recovery Position" and have had an opportunity to practice putting a casualty into it • have an opportunity to practice making a 999 call for an ambulance.
River/Railway	• be aware of the dangers posed by water • in the event of seeing someone in distress in the water have an appreciation of what help they can give whilst remaining safe themselves • be aware of the dangers of trespass and vandalism on the railway • know what action to take if obstructions/debris are found on a railway track
Country lane, Farm	• have an awareness of road safety in a rural environment • be aware of the provisions of the Country Code • have an awareness of hazards on farms

Figure 1: The Lifeskills ‘village’



3. EVALUATION DESIGN

3.1 BACKGROUND

A previous in-house evaluation of the Lifeskills programme suggested that visits to the programme were enjoyed, that '*there was a good recall of key messages'* and that '*in the short term, the Lifeskills experience had a positive impact on the children's knowledge'* [35]. In January 2001, the Lifeskills Management Board issued an invitation to tender for a more comprehensive evaluation of the 'Lifeskills – Learning for Living' programme. A team of researchers from the University of Oxford and Oxford Brookes University were appointed to undertake the evaluation and work commenced in March 2001.

The Oxford evaluation was designed to explore how well the Lifeskills programme achieves its aims. Specifically, the focus of the evaluation was on exploring how well the Lifeskills programme helps the children who visit the Centre to:

- be more alert to potential danger to themselves and others
- know what to do in potentially dangerous situations
- learn practical skills in coping with hazards
- develop-self confidence to use these skills to deal with hazards.

The evaluation was split into two parts and took place between March 2001 and September 2003. An Evaluation Steering Group was set up to guide the evaluation. Research ethics approval for the evaluation was granted by the Ethics Committee of the School of Social Sciences and Law at Oxford Brookes University.

3.2 EVALUATION METHOD

Overall design

Part 1 of the evaluation was designed to ascertain whether children who had been to Lifeskills had acquired safety knowledge (2001-2002). Part 2 of the evaluation was designed to test children's performance on a range of safety skills (2001-2003). In the second year of the evaluation, Part 1 was extended to see whether children could still remember knowledge acquired at Lifeskills twelve months after their visit. Appendix 1 shows the data collection timetable.

Part 1 of the evaluation – alertness and knowledge (from September 2001 – July 2002)

The first part of the evaluation used a longitudinal (three month) matched samples design. The Lifeskills children were tested immediately before and again immediately after experiencing the programme at the Lifeskills Centre. The Control children, none of whom had visited the Centre, were tested in their schools. Children in both groups were given follow-up tests in school three months after the initial testing took place.

The evaluation used a paper and pencil test which was developed specifically for the project to assess children's safety knowledge and alertness to hazards (see section 3.3).

Part 2 of the evaluation – practical skills and confidence (from September 2001 – April 2003)

The second part of the evaluation also used a longitudinal (three month) matched samples design. The Lifeskills children were tested immediately before and again immediately after experiencing

the programme at the Lifeskills Centre. The Control children, none of whom had visited the Centre, were tested in their schools. Children in both groups were given paper and pencil tests (as in Part 1) but at the three month follow-up they attempted to perform safety skills. This testing took place in two phases. In the first phase, during 2001-2002, children were observed at the Lifeskills Centre. In the second phase, during 2002-2003, children were observed at a different site. Testing children in another location permitted assessment of the extent to which performance of the children who had already visited the Lifeskills Centre had been assisted by circumstantial contextual cues when they were tested where the skills were first learnt.

At the three month follow-up, while attending for observation, Lifeskills and Control children also took part in facilitated focus group discussions on safety and risk.

Extension of Part 1 of the evaluation (September 2002 – March 2003)
Children in Year 7 completed the paper and pencil test in school. Some of these children had visited Lifeskills during Year 6, some had not. Comparison of such groups of children allowed conclusions to be drawn about the retention of knowledge acquired at Lifeskills over a 12-month period.

3.3 PAPER AND PENCIL TEST

Development of the paper and pencil test

Due to inevitable time restrictions during a school's visit to Lifeskills, it was not possible to evaluate the whole Lifeskills programme. With guidance from the Evaluation Steering Group, the Oxford team concluded that it would be possible to evaluate only about half the programme. After lengthy discussions, the Steering Group nominated the following five elements of the programme for evaluation – home safety, fire safety, first aid, road safety and drugs. Pictorial tests were developed for the majority of these elements. These tests had various forms. For example, for fire safety, participants were asked to select from eight line drawings the four that depicted the appropriate set of actions to take on discovering a fire had broken out. For room safety, the participants were asked to draw a circle around each potential hazard they noticed in a picture of a kitchen. These pictorial tests were developed especially for the evaluation.

Development and piloting of the paper and pencil test was carried out during the first few months of the evaluation. More than 100 children were involved in the piloting of the test, each taking one of the five successive versions of the test. As the test developed two kinds of change were made. Tests on which nearly 100 per cent of children could give the right answer without the Lifeskills experience were dropped, e.g. questions about smoke detectors, and about whether money is needed to make a 999 call. Changes were made to the test so that it could be understood and completed by most children within a 12- minute time slot. Since children were to be tested twice during school visits to Lifeskills, once before and once after they were taken round, 12 minutes was the maximum time available for each run of the test. Items were not created to replace those that had been depleted as the original version of the test took too long for the children to complete. At each stage of the test development the individual items were discussed with the Evaluation Steering Group so that they could ensure that the items fitted the key areas they had nominated for evaluation. (See Appendix 2 further details of the piloting process.)

In the final version of the paper and pencil test there were 10 items covering the five nominated elements: Home safety (knowing what to in the event of a gas leak, noticing kitchen hazards); Fire safety (knowing what to do in the event of a fire, noticing fire hazards in a bedroom); First aid (recognising the Recovery Position); Road safety (understanding the safe use of seat belts, pedestrian visibility in darkness or fading light, car stopping distance) and Drugs knowledge

(knowing the correct classification of various drugs). The children were also asked three questions about their confidence in dealing with emergencies. (See Appendix 3 for the paper and pencil test.)

Test administration

All the children participating in the evaluation took the paper and pencil test. In Part 1 of the evaluation only the paper and pencil test was used.

Lifeskills group

The paper and pencil test was administered twice to these participants at the Lifeskills Centre, once before they were taken round the 10 scenarios, and once after they had been round. The test took up to 12 minutes to fill in. When filling in the test after going round Lifeskills, the children were asked additional questions about which of the scenarios they had enjoyed most, and which they had visited last as the latter revealed the order in which they had visited the scenarios (see Appendix 4). These children completed the paper and pencil test again at school approximately three months after their visit to the Centre.

Control group

Children in this group acted as a matched comparison for the Lifeskills Group so that any effects of practice or maturation could be estimated. None of them had visited Lifeskills when they took the test. They completed the paper and pencil test at school. In order to mimic the test conditions of the Lifeskills group, the Control group children initially completed the test twice on the same day, separated by a gap of approximately two hours. They also filled in the test for a third time, again at school, approximately three months after they first took the test. All these children made a school visit to Lifeskills after the three month follow-up test.

3.4 OBSERVATIONAL TEST

Development of the observational test

This test involved observation of the children's performance on certain skills covered in the Lifeskills programme. It was carried out in the Lifeskills Centre three months after the children's initial visit. Each child was tested individually. Due to constraints of time and space during these return visits to the Centre it was not possible to observe children's performance on all the elements assessed with the paper and pencil tests. The skills selected for observational assessment were: Home safety (dealing with a gas leak, and making a kitchen safer for a toddler); Fire safety (carrying out a fire escape plan); First aid (placing someone in Recovery Position); and Road safety (demonstrating where a car would stop if it braked hard at 30 mph). These tests were chosen because they all involved the child in actively carrying out tasks.

The five tasks were located in three sectors of the Lifeskills Centre - fire and road safety in one sector; kitchen and gas safety in another sector; and first aid in a third sector. A sixth observational test was added to the first aid sector so that there were two tests in each sector. This enabled three children to be tested simultaneously, each child spending an equal amount of time in the three sectors of the Lifeskills scenario. The sixth test was an observation of a child's attempt to help someone in difficulties in a river. This was considered to be a suitable task to include in the observational test as it involved the child in actively performing a task. In addition, it requires children to take responsibility for others while making sure they do not endanger themselves. It was not assessed in the paper and pencil test.

A set of coding schemes was devised for the observational test (see Appendix 5). Initially a small number of children were observed in order to develop the observational test instruments. A full pilot was subsequently conducted on a class of 32 children who were invited to return to Lifeskills three months after an initial training visit. These two pilot sessions resulted in the final format of the coding scheme, and the final procedure adopted for the main observational study.

Test administration

This part of the evaluation was run twice – once on-site at Lifeskills, and once off-site. On both occasions there were two groups – a Lifeskills group and a Control group.

Lifeskills group

Children in the Lifeskills group visited the Centre three months prior to the observational testing. During this initial visit they completed the paper and pencil test immediately before and after going round the 10 scenarios. When the children filled the test in after going round Lifeskills they were asked additional questions about which of the scenarios they had enjoyed most and which they had visited last.

Control group

The Control group had also filled in the paper and pencil test three months prior to their visit for observational testing. This was administered twice on the same day with a gap of approximately two hours between the two occasions.

The observational test of performance took place three months after the initial paper and pencil testing. On arrival the class of children gathered in a large reception room. At the Lifeskills Centre three children were tested at a time. Each child started in a different sector and was tested individually. Children progressed from sector to sector in a set order with five minutes allocated to each sector. A bell was sounded at five-minute intervals to alert the guides to move between testing sectors.

Each child was accompanied by two adults. One was an experienced guide from the regular Lifeskills team. The second was a trained assessor either from the Evaluation team or from the Psychology Department , Oxford Brookes University (the latter of whom were unaware of which schools were in the Lifeskills and Control group). The guide took the child through the scenarios and conducted the assessment. The guide and the assessor independently filled in the coding sheets to assess each child's performance using a separate booklet for each child (see Appendix 5 for coding sheets and guides' instructions to the children).

For the sixth test, first aid scenario, a video record was made of the children's attempts to place another child in the Recovery Position.

After child was tested he/she was taken to a different part of the building to avoid discussion between children who had taken the test with children had not yet been tested. At this point, three more children began the tests.

When the observational tests were conducted off-site, it was possible to test six children individually at one time. In every other respect the procedure was identical to the testing procedure at the Lifeskills Centre.

3.5 FOCUS GROUP DISCUSSIONS

Focus groups formed part of the evaluation. They enable children to discuss their own experiences and perspectives amongst their peers in a group setting. Such group discussions are particularly valuable for the in-depth exploration of children's attitudes and understanding of relatively complex issues, such as peer pressure and drug use.

A pilot focus group session was held at the same time as the observational test piloting. This pilot rehearsed the interview questions, the procedures for managing the group and data recording. Children were involved in focus group discussions either at the Lifeskills Centre or at their schools (see Appendix 6). The groups were primarily conducted by one interviewer, although there were always two interviewers present, and the second interviewer was occasionally drawn into the conversation (See Appendix 7 for focus group schedule).

Phase 1

Mixed-gender focus groups of six children took place after observational testing at Lifeskills. They sat in a separate room away from the observational testing, on chairs arranged in a semi-circle. In each case, the interviewer sat facing the children. The discussions were both video-recorded and audio-recorded. The purpose of this was explained to the children. Each discussion lasted half an hour. The length of time spent covering each question varied according to the way the discussion developed.

Children who had attended the Lifeskills programme
The schedule focused on what they had liked and disliked about their visit to Lifeskills and their perceptions of risk and safety. Half of these focus groups were also asked about the Lifeskills Detective sheet (a check-list of safety features at home which is given to all children after their school visit to Lifeskills). In the other groups, the children were shown a line-drawing of one male and two female adolescents with drinks in their hands (see Appendix 8). A caption states that the boy has just offered one of the girls some pills. This was used to trigger discussion about drugs.

Children who had not attended the Lifeskills programme
Children in these focus groups of children who had not attended the Lifeskills programme discussed their perceptions of drugs, and of risk and safety.

Phase 2

Undertaking the observational tests could have influenced the content of discussion in the focus groups at the Lifeskills Centre, including for children in the Control group. Two schools involved in Phase 2 of the evaluation were therefore requested to host discussion groups in school. None of the children in these discussion-only groups had been to Lifeskills or taken part in any of the evaluation's tests. Nor were they subsequently included in any further tests.

Discussion-only groups
These focus groups were held in school. Children were allocated by their teachers to mixed-gender groups containing between five and seven children. Children taking part sat in a separate area away from their classroom, on chairs arranged in a semi-circle. In each case, the interviewer sat facing the children. The discussions were audio-recorded. The purpose of this was explained to the children. Each discussion lasted twenty minutes. Children were asked about their perceptions of drugs and of risk and safety. The length of time spent covering each question varied according to the way the discussion developed.

Data analysis

The focus groups were question and answer sessions which generated spontaneous discussion amongst the children were fully transcribed. For instance questions about the Lifeskills programme such as 'Which Lifeskills set did you like best?' were answered in some detail by most children allowing the creation of a rich data set. Other questions such as 'What is the most dangerous risk which children your age face?' were broader in scope and enabled the children to offer and explore with one another their own ideas about risk. The line-drawing was used to trigger discussion about drug issues. The textual material was coded and analysed for common themes (e.g. similar recurrent features found in different children's descriptions of what they had liked about Lifeskills or found in different children's perceptions of risk).

3.6 RECRUITMENT OF PARTICPANTS

Recruitment for Part 1 and Part 2 during (2001-2002)

Eighty-nine schools booked to visit the Lifeskills programme from December 2001 – July 2002 were invited to take part in the evaluation by letter (see Appendix 7). Of these 89 schools, 70 schools were invited to take part in the Lifeskills Group of which 19 accepted. Fourteen of these 19 schools, either Junior or Primary, were drawn from the state sector; five were drawn from the independent sector. Nineteen schools scheduled to visit the Lifeskills Centre in the summer term of 2002 were invited to take part in the Control group. Seven of these 19 schools accepted, six, either Junior or Primary, were drawn from the state sector and one from the independent sector. Children from these schools visited the Lifeskills Centre only after they had completed the written tests three times. Care was taken to match the Lifeskills group and the Control group. In the initial stages of matching, the following indicators were used to maximise both the range of schools recruited and the match between the Lifeskills and Control children.

- School key stage 2 (Year 6) SATs scores[2]
- Percentage of children in school entitled to free school meals[3]
- Percentage of children in school on the Special Educational Needs register[2]
- Percentage of children in school with English as an Additional Language[3]
- School size[2]
- Geographical area of the school (e.g. rural, urban)[3]
- Catchment area of the school (e.g. private housing, unemployment, affluence)[3]

The primary criterion on which the state schools were matched was academic achievement. State schools were categorised as 'higher achieving' if the school achieved an average key stage 2 SATs score of equal to or above the national average for primary schools in England or as 'lower achieving' if the school achieved an average key stage 2 SATs score of less than the national average in the previous school year (based on 2001 data). There were equal proportions of higher and lower achieving state schools in the Lifeskills and Control groups. Since only one independent school invited to participate in the Control group accepted, it was decided that the data from the independent schools would be excluded from the analyses described below.

The majority of schools in the study were tested only using the paper and pencil test (Part 1 of the study). Four schools (two higher achieving, two lower achieving) from the Lifeskills Group and two schools (one higher and one lower achieving) from the Control Group were asked to

[2] www.dfes.gov.uk for Performance Tables
[3] www.ofsted.gov.uk for individual school Ofsted reports

participate in the observational test and discussion groups at the three month follow-up rather than do the paper and pencil test (Part 2 of the study). All agreed to participate. The school that accepted the earliest date scheduled for observational testing agreed to act as the pilot observational test school.

Recruitment for Part 2 off-site observational tests during 2002-2003

The off-site tests were conducted in Chew Stoke Pumping Station, a building now used for conferences and previously utilised by Lifeskills for running training programmes.

Seven primary schools were invited by letter to participate in the off-site observational tests. Selection of the schools was made according to the following criteria:

- date of the planned Year 6 Lifeskills visit for each school
- the achievement level of the school based on whether or not they were above or below the national Key Stage 2 SAT test scores (based on 2001 data)
- geographical proximity to Chew Stoke Pumping Station (testing site)

Of the seven schools, two (one higher and one lower achieving) were due to attend the Lifeskills Programme after the planned observational test dates in March/April 2003. They were invited to be the Control Group. The other 5 schools (three higher achieving and two lower achieving) were due to attend the Lifeskills Programme during the Autumn term in 2002 (i.e. prior to the observational testing). One higher achieving school agreed to be the pilot for the observational tests, and the other four became the Lifeskills Group. All schools were located within a half hour coach journey from the Pumping Station in order to facilitate practical arrival and departure times at the site.

Recruitment of participants for the extension of the Part 1 paper and pencil testing in Year 7 (2002-2003)

Four secondary schools were invited by letter to participate in the completion of the Year 7 paper and pencil test. Selection of the schools to help with the Year 7 tests was made according to the following criteria:

- the achievement level of the school based an whether or not they were above or below the national 5+ A* - C GCSE Grades (averaged between 1999 and 2002)
- mixed gender schools
- spread of schools between the four Local Education Authorities (LEAs) covered by the Lifeskills catchment
- evidence that some children in Year 7 had attended the Lifeskills programme in Year 6

Recruitment of the schools was assisted by the involvement of Schools for Health Co-ordinators for the four LEAs in the Lifeskills' catchment area – Bristol, Bath and North East Somerset, South Gloucestershire and North Somerset. These Co-ordinators agreed to help recruit schools following a meeting where the evaluation team gave a presentation about the study. Co-ordinators personally asked Schools for Health link-teachers if their schools would be able to help. After initial permission for contact was granted, an invitation letter was sent to each school.

All 4 schools agreed to participate. In three of the schools, Year 7 were gathered together during assembly time when a general explanation of the research and the questionnaire was given. Children completed the questionnaire in class-time under the supervision of their teachers, who

had received written instructions about its completion. In the other school, the Year 7 children completed the questionnaire in assembly.

Of the Year 7 children, 435 stated that they had been to the Lifeskills Centre during Year 6. Of these, 52 had already participated in the Lifeskills evaluation during their Year 6. Of the year 7 children, 236 stated that they had not been to Lifeskills (See Appendix 6).

4. RESULTS

4.1 THE EVALUATION

Summary

The evaluation of the Lifeskills Programme involved testing children across two school years using paper and pencil tests of knowledge (Part 1, and Part 1 extension into year 7) and observational tests of performance (Part 2). Details of the timescale and tests have been given in Section 3.

The evaluation was based on two types of statistical analysis. The first was a comparison of the numbers of children in the Control and Lifeskills groups who were correct on all features in a given scenario (referred to as perfect achievement). The second type of statistical test compared the mean average scores of the children in the Control and Lifeskills groups on the number of features correct for each scenario in turn. In the text below the term "significant" will always indicate statistically significant at or above the one per cent (0.01) level.

Table 2 shows that by the perfect achievement index Lifeskills children did better than the Control children on slightly more than half the tests. By the average score index the Lifeskills children almost invariably did significantly better than the Control children.

Lifeskills-Control comparisons at Time 1, before the Lifeskills children had received any training, were important to establish that the groups were matched for knowledge before the intervention. Comparisons were carried out for all the knowledge tests for all the children who were used in the analyses of Part 1 and Part 2 of the evaluation. In no case did the Lifeskills children do better than the Control children before the intervention. This demonstrates that the groups were appropriately matched for initial knowledge (see Appendix 10).

Table 2: Summary table of results

	% of tests on which Lifeskills children did significantly better than Control children	
	As measured by % of children with perfect achievement	As measured by children's scores
Performance 3 months later, off-site	50%	83%
Performance 3 months later, on-site	50%	83%
Knowledge 3 months later	80%	100%
Knowledge 12 months later	30%	67%

4.1.1 Performance

Since Lifeskills' primary aim is to teach children the practical skills necessary to *act* appropriately to secure themselves and others against various dangers and hazards, the observational tests of their performance of such tasks are the best test of their competence.

Observational tests were carried out at the Lifeskills Centre and also off-site to minimise the possibility that the performance of the Lifeskills children tested at Lifeskills would be enhanced due to situational cues and familiar surroundings.

The off-site performance comparison of the Lifeskills and Control children is the most diagnostic of the relative success of the Lifeskills programme. We therefore initially focus on this off-site comparison.

Performance off-site

The children were taken through six scenarios which produced a total of eight tests. For each test there was a set of features on which the child's performance was scored. The number of features varied from test to test.

The way in which the eight tests were introduced to the children is described below.

Water safety (a) what to do: the child was standing beside an artificial water feature. The guide said, "I want you to imagine that you are walking near a river and you see someone in the river calling for help because they can't swim. Can you show me what you would do?" The guide and the second observer used the coding sheet to note the child's appropriate or inappropriate (and dangerous) actions. The four appropriate actions were: calls to reassure the person; lies or kneels down to reach out with a suitable object; throws in something that will float, and rings for help or asks someone to ring for help. The inappropriate actions were: goes into the water, and reaches out while standing up.

Water safety (b) what not to do: Secondly the guide asked the child, "Are there any things that would be unsafe for you to do?" The appropriate answers were: go into the water; reach out while standing up, and go into someone's house if the child went to look for help).

Gas (a) what not to do (home safety): the child was in a real kitchen. The guide said to the child, "I want you to imagine that you have just come into the room and you can smell gas." The guide then asked, "Are there any things you should never do if there is a gas leak?" There were two correct answers: switch lights or other electrical appliances on or off; phone using the mobile in the kitchen.

Gas (b) what to do: after completion of the previous task, the guide said to the child, "Now, can you show me what you would do?" The child's performance was then observed, and the appropriate or inappropriate (and dangerous) actions were checked off on the coding sheet by the guide and the second observer. The three appropriate actions were: opens window/door; suggests switching off the gas at the mains; phones using the landline in the house. The inappropriate actions were: phones using the mobile in the kitchen, and switches lights or other electrical appliances on or off.

Fire escape plan (fire safety): the child, guide and observer were in a room. The guide said to the child, "I am going to ask you to open one of the doors here. Behind the door the room is on fire. It's not a real fire, but I want you to do whatever you would do if it was a real fire." The guide then pointed to one of the doors and said, "Open the door". When the door was opened the

mock fire effects began, with loud noise and "smoke". The appropriate actions were, in the right order: shuts door to fire; gets down low; shouts "fire"; leaves the building; picks up phone outside; dials 999 and asks for the fire service.

Noticing kitchen hazards (home safety): the child was in a different kitchen. There were a number of obvious hazards in the room, such as a knife on the worktop with its blade overhanging the edge (for further details of the hazards see Appendix 5). The guide said to the child, "Please rearrange this room so it is safe for a toddler." There were seven hazards in total. All the hazardous objects could be moved. The coding allowed the guide and the observer to note whether each object was actually moved into a safe position or not.

Recovery Position (first aid): Lying on the ground in a supine position was a child volunteer. The guide said to the child being tested, "You are in an adventure playground, and you have just seen someone fall over. When you reach him/her, you can see that he/she is breathing but unconscious. Can you show me what position you would put him/her in before you go and get help?" (When the instructions were read out the use of "she" or "he" was varied according to the gender of the volunteer patient.). There was a coding sheet for the Recovery Position but during the pilot testing the observers and guides found it difficult to use because of the speed of the children's movements. After that, therefore, the child's attempt to move the "patient" was videotaped.

After the participants had tried to put the "patient" into the Recovery Position, they were asked, "Do you think you got that right?" Children were offered four possible responses: Yes certainly right; Not quite right; Not sure; and No. It's not right. Some children did not attempt to move the "patient" at all. They were not asked this extra question. All children were asked, "Can you tell me what the right position is called?"

Car stopping distance (road safety): the child was on the private road at the front of the pumping station. The guide said to the child, "We are in a street". He or she then indicated a (stationary) car to the right of the child. The guide said: "The car travelling towards us is coming at 30 m.p.h. The driver brakes as hard as possible. Go and stand on the pavement at the place where you think the car will stop." The guide and second observer then marked on a photograph of the road the position where the child elected to stand.

The way in which the different observational tests were scored was as follows:
Help someone in the water - one mark each for calling to reassure the person, reaching out with suitable object while lying or kneeling down, throwing in something that will float, and ringing for help or asking someone to do so; one mark each for saying never go into the water, reach out while standing, or go into a house when one has knocked to ask for help (possible range 0 - 7).
Gas leak response - one mark each for saying never switch lights or appliances on or off, or use mobile phone in house; one each for opening window or door, suggesting switching off gas at mains, and phoning with the landline in the house (possible range 0 - 5).
Fire escape plan - one mark each for slam room door, get down, shout "fire", exit, phone, dial 999, and ask for the fire service; one for correct order (possible range 0 - 8).
Kitchen hazards removed - one mark for each hazard moved to a safe place possible range 0 - 7).
Recovery Position - one mark for each of the five appropriate moves (possible range 0 - 5).
Car stopping distance - The only scenario without such a multi-part routine or set of questions was the road. There the task was a single, simple indication of where the car "travelling towards us . . at 30 m.p.h." might come to a halt if the driver braked as hard as possible. The correct answer was 75 feet. Marks were therefore given from zero to 75. Since a child indicating more

than 75 erred on the side of safety this was treated as the equivalent of a correct estimate and scored 75.

Inter-rater reliability was established to be over 95% in five of the six tests - the water, gas, fire, kitchen and car stopping distance tests. For the sixth test, the Recovery Position, the video recordings were rated by a trained first-aider/occupational nurse, not informed of whether the children were in the Lifeskills or Control groups (and the observers' coding sheets were not analysed).

The results for perfect achievement shown in Table 3 are the percentages of children on each scenario who scored the maximum possible on the scoring system described above.

The analyses reported in Table 3 are based on loglinear analyses which included as factors Lifeskills/Control, gender, and schools' achievement level (high v low). Such analyses permit the isolation of effects due solely to the Lifeskills intervention. Table 3 shows the percentages of children in the Control and Lifeskills groups with perfect achievement on the eight tests. Shaded rows indicate the tests on which the numbers of Control and Lifeskills children achieving this differed at a statistically significant level. The 0.01 level of statistical significance rather than the 0.05 level was chosen to avoid random Type 1 error due to the large number of tests.

Table 3: Performance off-site - Lifeskills/Control comparison, Percent of children achieving perfect performance

	% Control children with a perfect achievement	***% Lifeskills children with a perfect achievement***	***Statistical comparison of Control & Lifeskills children***	
N	46	148	χ^2	P
Water (what to do)	0%	3%	1.87	NS
Water (what not to do)	0%	5%	4.21	NS
Gas (what to do)	4%	25%	12.01	***
Gas (what not to do)	2%	22%	12.59	***
Fire	0%	9%	7.88	**
Kitchen	85%	80%	0.60	NS
Recovery	0%	0%	0.00	NS
Car stopping distance	2%	34%	26.30	***

χ^2 derived from a series of hierarchical loglinear analyses, df 1
Shading signifies a statistically significant difference between Control and Lifeskills groups
***p < 0.01 ***p < 0.001*

The Lifeskills group children did better than the Control group children on four of the eight tests. Hardly any children in the Control group managed perfect achievement on any test, except for the Kitchen test where the great majority of them (85%) did. The great majority (80%) of the Lifeskills children also managed perfect achievement on the Kitchen test. Approximately a quarter to a third of the Lifeskills children managed perfect achievement on three of the other tests (Car Stopping Distance, 34%; Gas what to do, 25%; Gas what not to do, 22%). In these three cases the differences between the Lifeskills and Control group were highly significant. The Lifeskills children did better than the Control group children on the Fire test, but even so only 9% of the Lifeskills children had a perfect achievement on this test. Hardly any Lifeskills children managed a perfect achievement on the Water (what to do, and what not to do) and Recovery Position tests. They did no better than the Control group. There was also no significant difference between Control and Lifeskills groups on the Kitchen test since the great majority of both groups produced perfect achievement.

In summary

- On three tests (Gas what to do, Gas what not to do, Car Stopping Distance) there was a substantial Lifeskills effect.
- On one test (Fire) there was a significant but smaller Lifeskills effect.
- On four tests (Water what to do, Water what not to do, Kitchen, Recovery Position) there was no value added effect for the Lifeskills programme.

The results of the second type of analysis are shown in Table 4. There is one score per scenario. For the Water and Gas scenarios the "what to do" and "what not to do" scores were summed since in each the case the very few "what not do" features meant that separate analyses of their scores were not possible. The shading again highlights statistically significant differences. The Lifeskills children outperformed the Control group children at a high level of statistical significance, on all tests except the Kitchen.

Use of a graduated score index rather than an all-or-nothing perfect achievement index gives a more positive picture of the success of the Lifeskills programme. Table 4 shows that there was a substantial Lifeskills effect on five of the six scenarios including Fire and Water where the perfect achievement index in Table 3 suggested an effect that was weak at best. In the case of the Recovery Position Table 3 shows that no children in either group managed a perfect achievement, but Table 4 shows that the number of features mastered by the Lifeskills children was greater than the number mastered by the Control children.

In contrast the score index reinforces the implication of the perfect achievement index that the Kitchen safety features that Lifeskills teaches are ones that children have already mastered without the assistance of the Lifeskills programme.

Detailed information about the particular features on which the Lifeskills children improved as a result of the programme are described in Section 4.2. Individual item tables are in Appendix 12. In the Water scenario, the children had learnt to throw in a floating object to help the person in the water, and not to go into the water themselves. In the Gas scenario, the children had learnt that they should switch off the gas at the mains and phone for help using the house landline. They could also state the rule that they should not use a mobile phone in the house in the event of a gas leak. In the Fire scenario, the children had learnt to shut the door of the room in which there is a fire, to keep down low as they left the house, and to call for help using a phone outside the house. In the case of the Recovery Position, the children had learnt to place the injured person on his/her side and to position the upper shoulder sufficiently far over to ensure that the person does not roll backwards.

Table 4: Performance off-site - Lifeskills/Control comparison, Scores on each scenario

		Control children	***Lifeskills children***	***Statistical comparison of Control & Lifeskills children***	
	Score out of	46	148	F	P
Water	7	1.35	2.69	35.88	***
Gas	5	1.69	2.71	23.57	***
Fire	8	2.48	4.53	41.86	***
Kitchen	7	6.78	6.73	0.32	NS
Recovery Position	5	1.32	1.94	11.48	***
Car Stopping Distance	75	32.74	58.67	90.32	***

Series of univariate analyses of variance, df 1/186
Water what to do and what not to do sum to a single score.
Gas what to do and what not to do sum to a single score.
Shading signifies a statistically significant difference between Control and Lifeskills groups.
***p < 0.01 *** p < 0.001*

Amongst the key messages not learnt were three that are potentially dangerous to the child. In the Water scenario the majority of the Lifeskills children made the mistake of reaching out to help someone in difficulty while they themselves were *standing* at the edge of the water. In the Gas scenario just as many Lifeskills children as Control children switched electric appliances on/off or used a mobile in the house.

The off-site performance tests discussed above are the best index of the Lifeskills children's performance as it cannot be artificially enhanced by the identity of the learning and testing environment. In general, the Lifeskills children did outperform the Control children off-site except on the task involving kitchen hazards.

On-Site/Off-site performance comparisons
On-site the children were taken through the same six scenarios as off-site. In both locations these scenarios produced eight tests. The on-site performance produced very similar results to the off-site performance. Table 5 shows the percentage of children with perfect achievement in the observational tests off-site and on-site. Table 6 shows the scores for the same children.

Table 5: Performance off-site and on-site - Lifeskills/Control comparison, Percent of children with perfect achievement

	Performance Off-site		***Performance On-site***	
	C	L	C	L
N	46	148	48	72
Water (what to do)	0%	3%	0%	1%
Water (what not to do)	0%	5%	0%	0%
Gas (what to do)	4%	25%	0%	19%
Gas (what not to do)	2%	22%	2%	15%
Fire	0%	9%	0%	10%
Kitchen	85%	80%	73%	85%
Recovery Position	0%	0%	0%	1%
Car Stopping Distance	2%	34%	0%	38%

Shading signifies a statistically significant difference between Control/C and Lifeskills/L groups (series of hierarchical loglinear analyses).

Table 5 shows that both off-site and on-site the Lifeskills children did better than the Control children on four of the eight perfect achievement tests. Table 6 shows that both off-site and on-site the Lifeskills children scored better than the Control children on five of the six score tests.

The figures in both tables and the statistical tests that were carried out show that the Lifeskills children's on-site performances were not significantly different from the Lifeskills children's off-site performances. Similarly there were no significant differences between the Control group children's on- and off-site performances.

A further analysis was carried out to compare the performance of children on- and off-site and to investigate whether the Lifeskills programme differentially affected children according to gender, special needs, and the achievement level of their schools. The scores used were the number of the eight tests that each child got right (i.e. on which he/she achieved a perfect performance). The highest score possible was therefore eight. The scores ranged from 0 – 5 out of 8, and were negatively skewed with a modal score of 1. The variable was therefore recoded into a binary score (viz. 0 – 1, achieved by 61% of the children; and 2 - 5, achieved by 39% of the children).

A hierarchical loglinear analysis showed that there was only one statistically significant effect – viz Lifeskills versus Control. Thus gender, special needs, and academic achievement level of the schools had no impact on the effectiveness of the Lifeskills experience in improving children's overall safety skills. Fifty four percent of the Lifeskills children achieved a higher score (2 – 5), whereas only five percent of the Control group did.

Table 6: Performance off-site and on-site - Lifeskills/Control comparison, Scores on each scenario

	Performance Off-site		***Performance On-site***	
	C	L	C	L
N	46	148	48	72
Water	1.35	2.69	1.50	2.38
Gas	1.69	2.71	1.10	2.46
Fire	2.48	4.53	3.44	4.69
Kitchen	6.78	6.73	6.60	6.82
Recovery Position	1.32	1.94	1.29	2.09
Stopping Distance	32.74	58.67	43.32	66.76

Water what to do and what not to do sum to a single score.
Gas what to do and what not to do sum to a single score.
Shading signifies a statistically significant difference between Control/C and Lifeskills/L groups (series of univariate analyses of variance).

4.1.2 Confidence, order and enjoyment in relation to performance

One of Lifeskills' aims to be explored was the children's confidence in using their safety skills. The children's hesitation in beginning a task was used as an index of their confidence in their ability to accomplish the task – the longer they took to begin, the less confident they were assumed to be.

Given the marked similarity of performance on- and off-site for both groups, the hesitation scores for the two locations were amalgamated. Hesitation times for each scenario are shown in Table 7. Lifeskills children were significantly quicker on four of the scenarios, but not on the Gas or Kitchen scenarios. This implies that the Lifeskills children generally felt more confident in their ability to respond to the emergencies presented. Given that as a group their performance was better than the Control group's, the confidence of the Lifeskills children appears justified. Nevertheless it is important to check that within the Lifeskills group those who were more confident were also performing better.

Table 8 shows the correlations between performance score and hesitation for the Lifeskills and Control groups separately. A negative correlation is appropriate as it shows that a better performance was associated with greater confidence (i.e. a shorter time taken to initiate action).

Table 7: Confidence, as measured by reaction times (in seconds), Lifeskills/Control comparison (Off-Site and On-Site merged)

	Control	***Lifeskills***	***Statistical comparison of Control & Lifeskills children***	
N	94	220	F	P
Water	9.49	4.35	18.73	***
Gas	5.63	4.67	0.97	NS
Fire	8.10	2.66	32.61	***
Kitchen	2.86	2.10	2.02	NS
Recovery Position	9.88	5.66	10.38	***
Car Stopping Distance	5.68	2.59	26.13	***

Series of univariate analyses of variance, df 1/306
Shading signifies a statistically significant difference between Control and Lifeskills groups.
**p < 0.01 ***p < 0.001

The correlations were appropriate and significant for the Lifeskills group. In combination with the results outlined above, this indicates that the Lifeskills programme not only increased children's confidence in their ability to perform but also increased it appropriately – i.e. those who were more confident were by and large performing better. In contrast, for the Control group only two of the six correlations between confidence and performance were significant. This implies that in the Control group the confidence of some children appeared to be misplaced. In four of the six scenarios the most confident Control group children were not necessarily those best able to perform the task.

The fact that the Lifeskills programme instilled confidence, and instilled it appropriately, is an important achievement since confidence leads to action but misplaced confidence is potentially dangerous.

There was a further index of children's certainty and understanding in the performance test. This was for the Recovery Position. After they had attempted to put the 'body' into the Recovery Position children were asked, "Do you think you got that right?" They were shown a scale which ran from "Yes, certainly right" through "Not quite right" and "Not sure" to "No, it's not right". This was coded for analysis into two categories: Certainly right and Not quite right v Not sure and Not right.

Table 8: Relation of confidence (reaction time) to performance

	Control	***Lifeskills***
N	94	220
	R	R
Water	- 0.18	- 0.17
Gas	- 0.29	- 0.24
Fire	- 0.08	- 0.16
Kitchen	- 0.04	- 0.31
Recovery	- 0.40	- 0.19
Road distance	+ 0.16	- 0.29

Shading signifies a statistically significant correlation between confidence and performance.

The two groups' judgements of their own performance did not differ at a statistically significant level, although 46% of the Lifeskills children thought they were right or about right and only 36% of the Control group judged their own performances in this way. As hardly any of the children managed to get the Recovery Position completely right, the fact nearly a half of the Lifeskills children thought they were right is disappointing.

Nevertheless loglinear analysis showed that the more features of the Recovery Position the children had right the more likely they were to think they were right ($\chi^2 = 19.74$, 2 df, $p < 0.001$). This relation was found in both the Lifeskills group and the Control group. This is encouraging since it shows that children in both groups had sufficient understanding of the features of the Recovery Position that they were more likely to judge their performance right if it was one of the better efforts.

At the end of their visit to Lifeskills, the paper and pencil test asked the children which scenario they had enjoyed the most, and which they visited last. The latter question revealed the order in which they had gone round the scenarios. Analyses showed that neither order nor enjoyment had any effect on performance on any test three months after their visit.

4.1.3 Knowledge

Knowledge of what to do in an emergency was assessed by a pencil and paper test which covered five areas also covered in the observational tests (gas, fire, kitchen, recovery, and car stopping distance). Four further areas were covered – bedroom (an aspect of fire safety), seat belts and pedestrian visibility (two further aspects of road safety), and drugs. Water safety was not covered in the pencil and paper test.

In Part 1 of the evaluation the picture-book paper and pencil instrument developed to test safety knowledge was administered to children in Year 6 who had visited Lifeskills, and to a Control

group who had not visited Lifeskills at the time of being tested. The test was administered three times – see Section 3 for details.

Safety knowledge 3 months after a Lifeskills visit

Table 9 shows the percentages of Lifeskills children with perfect achievement on the components of the pencil and paper test three months after their visit to Lifeskills as compared to a matched Control group.

The range of performance varied widely across the tests for both groups. For the Lifeskills group the range was 15% to 94%, and for the Control group the range was 2% to 59%. The best performance (i.e. the highest percentage of children with perfect achievement) was for the Recovery Position for both the Lifeskills and Control groups. The worst performances were for the Bedroom and Gas (what to do) tests for both groups.

The Lifeskills group did better than the Control group on all but two of the knowledge tests. Some of the effects were very strong, such as Car Stopping Distance and Recovery Position. The two tests on which they did no better than the Control group were aspects of road safety, namely knowing the one person-one belt rule for seat belts, and understanding how difficult a pedestrian is to see if not wearing reflective clothing in darkness or poor light.

Table 9: Knowledge in Year 6 - Lifeskills/Control comparison, Percent of children with perfect achievement 3 months after initial testing

	Control	***Lifeskills***	***Statistical comparison of Control & Lifeskills children***	
N	121	376	χ^2	P
Gas (what to do)	2%	21%	25.15	***
Gas (what not to do)	25%	52%	27.59	***
Fire	21%	44%	21.53	***
Bedroom	3%	15%	11.59	***
Kitchen	45%	67%	18.91	***
Recovery Position	59%	94%	86.02	***
Car Stopping Distance	23%	89%	199.09	***
Seat Belts	50%	60%	4.36	NS
Pedestrian Visibility	30%	35%	1.21	NS
Drugs	6%	44%	52.41	***

Series of hierarchical log linear analyses, df 1
Shading signifies a statistically significant difference between Control and Lifeskills groups, **p < 0.01 ***p < 0.001

Table 10: Knowledge in Year 6 - Lifeskills/Control comparison, Scores on each scenario 3 months after initial testing

		Control children		***Lifeskills children***		***Statistical comparison of Control & Lifeskills children***	
N		121		376			
	Score out of	Mean score	Sd	Mean score	Sd	F	P
Gas	5	2.17	0.95	3.22	1.14	84.28	***
Fire	8	5.26	1.81	6.24	1.80	26.85	***
Bedroom	7	4.72	1.12	5.09	1.25	8.44	**
Kitchen	7	6.07	1.12	6.54	0.75	28.20	***
Recovery							
Car Stopping Distance	75	66.69	9.04	74.32	2.39	220.82	***
Seat Belts							
Pedestrian Visibility							
Drugs	8	5.49	1.68	6.78	1.57	53.04	***

Series of univariate analyses of variance, df 1/495
Gas what to do and what not to do sum to a single score.
Empty rows where parametric comparison of scores cannot be made.
Shading signifies a statistically significant difference between Control and Lifeskills groups.
**p < 0.01 ***p < 0.001

Table 10 shows the average number of features correct for the Lifeskills and Control group on each paper and pencil test three months after the Lifeskills children's visit to the Centre. The tests for Recovery Position, Seat Belts and Pedestrian Visibility do not generate scores suitable for parametric statistical testing. The score data in Table 10 give a very similar picture to the perfect achievement data in Table 9. The Lifeskills children outperformed the Control children on all scoreable tests.

A further analysis was carried out to investigate whether the Lifeskills programme differentially affected children according to gender, special needs, and the achievement level of their schools. Each child was given a score for the number of paper and pencil tests on which they managed perfect achievement. These scores were normally distributed. The scores ranged from 0 – 10 out of 10, and the mean was 4.71 (sd = 2.01).

An analysis of variance on these knowledge scores showed two statistically significant main effects. Lifeskills children performed better than Controls (5.31 v 2.75), and children without

special educational needs performed better than those with special needs (4.80 v 3.68). There were no interactions between the training and gender, school type or special needs, i.e. the Lifeskills training was equally effective for boys and girls, for children from lower and higher achieving primary schools, and for children with and without special educational needs.

The percentage of children in the Control and Lifeskills Year 6 groups who were correct on each feature of the scenarios is given in section 4.2. Tables for individual items are given in Appendix 12. That section provides detailed information about the particular features on which the children improved as a result of the Lifeskills programme.

Safety knowledge 6 – 18 months after a Lifeskills visit

In the second year of the evaluation, the paper and pencil test was administered to children in Year 7, over half of whom had visited Lifeskills during the previous year. The Year 7 children were tested once only, whereas the Year 6 children discussed above had been tested three times. Since the Year 7 children's visit to the Lifeskills programme had taken place 6–18 months earlier (with an average of 12 months) this administration of the test provides an index of the long lasting effects of the Lifeskills programme.

Table 11 shows the percentages of Control and Lifeskills children in Year 7 with perfect achievement on the 10 tests. All Year 7 tables and analyses exclude the children who had previously been part of the Year 6 evaluation. This was because very few (52) of the study's Year 6 cohort formed part of the Year 7 cohort.

Success on different topics in the paper and pencil test was very variable for both groups of children, ranging from 3% to 69% for the Control group, and 4% to 75% for the Lifeskills group. Regardless of group, the smallest percentage attaining perfect achievement was found on the Bedroom test, and the highest was on the Recovery Position.

The Lifeskills group did strikingly better than the Control group on the Car Stopping Distance and the Kitchen tests. They also did significantly better on Gas (what not to do). There were no differences between the two groups on Gas (what to do), Fire, Bedroom, Recovery Position, Seat Belts, Pedestrian Visibility, and Drugs. Comparison of Tables 9 and 11 show that three months after their visit to the Centre, Lifeskills children had superior knowledge to the Control group on eight out of 10 tests, and maintained this superiority at 12 months on three of these tests.

The results of the second type of analysis are displayed in Table 12 which shows the average number of features correct for each group on each test. The Lifeskills children did better than the Control children on four of the six tests, viz Gas, Fire, Kitchen and Car Stopping Distance. These results are the same as they were on the perfect achievement index, except for Fire. Comparison of Table 10 and 12 shows that three months after their visit to the Centre, the Lifeskills children knew more than the Control children on all six of the scoreable tests. At 12 months they still knew more than the Control children on four of the six tests. On the Bedroom tests there was no difference between Lifeskills and Control children on either index.

Table 11: Knowledge in Year 7 - Lifeskills/Control comparison, Percent of children with a perfect achievement

	Control	*Lifeskills*	*Statistical comparison of Control & Lifeskills children*	
N	199	298	χ^2	P
Gas (what to do)	5%	10%	4.59	NS
Gas (what not to do)	22%	33%	7.89	**
Fire	16%	24%	4.87	NS
Bedroom	3%	4%	0.86	NS
Kitchen	33%	55%	23.92	***
Recovery Position	69%	75%	1.89	NS
Car Stopping Distance	36%	69%	52.54	***
Seat Belts	50%	57%	2.45	NS
Pedestrian Visibility	25%	31%	1.72	NS
Drugs	29%	19%	5.77	NS

Series of hierarchical loglinear analyses, df 1
Shading signifies a statistically significant difference between Control and Lifeskills groups.
**p < 0.01 ***p < 0.001

For the Drugs task Table 11 shows that the proportions of each group with a perfect achievement did not differ statistically, but Table 12 shows that the groups' scores were significantly different, with the Control group knowing more than the Lifeskills group. Further analysis of the year 7 drugs data revealed that children from one of the four schools involved knew significantly more about drug categories than children from the other three schools. This superior knowledge was common to Lifeskills and Control children in this school and may have derived from school-specific tuition in year 7. Analyses showed that this school differed from the other three schools only on drugs knowledge. Its children did not have superior knowledge in any other areas of the test.

When the school with superior drugs scores was not included in the analysis, comparison of Lifeskills and Control children's drugs' knowledge scores showed no significant difference: (Control, 5.79; Lifeskills. 6.00, F = 0.57, df 1/273). Dropping this school had no impact on Lifeskills-Control comparisons in any of the other knowledge areas. The table in Appendix 13 shows how minimally these other mean scores were affected by the exclusion of this school.

Table 12: Knowledge in Year 7 - Lifeskills/Control comparison, Scores on each scenario

		Control children		***Lifeskills children***		***Statistical comparison of Control & Lifeskills children***	
N		199		298			
	Score out of	Mean score	sd	Mean score	sd	F	P
Gas	5	2.27	1.07	2.70	1.01	20.78	***
Fire	8	4.88	1.83	5.36	1.83	8.00	**
Bedroom	7	4.35	1.20	4.57	1.28	3.87	NS
Kitchen	7	5.65	1.32	6.27	0.99	35.24	***
Recovery Position							
Car Stopping Distance	75	69.50	7.16	71.76	8.93	9.27	***
Seat Belts							
Pedestrian Visibility							
Drugs ♦	8	6.59	1.37	6.10	1.71	11.78	***

Series of univariate analyses of variance, df 1/495
Gas what to do and what not to do sum to a single score;
Empty rows where parametric comparison of scores cannot be made.
Shading signifies a statistically significant difference between Control and Lifeskills groups.
**p < 0.01 ***p < 0.001
♦ On the Drugs test, the Control group had a higher score than the Lifeskills group.

A further investigation was carried out to see whether the Lifeskills programme differentially affected children according to gender, and the achievement level of their schools. Each child in year 7 was given a score for the number of pencil and paper tests they got right. These scores were normally distributed. The scores ranged from 0 – 8 out of 10 with a mean of 3.47 (sd = 1.52). An analysis of variance on these overall knowledge scores produced three statistically significant main effects. Lifeskills children performed better than Controls (3.90 v 2.88), girls performed better than boys (3.58 v 3.37), and children from higher achieving primary schools performed better than children from lower achieving primary schools (3.54 v 3.44). There were no interactions between the Lifeskills training and gender or school type, i.e. the Lifeskills programme was equally effective for boys and girls, and for children from lower and higher achieving primary schools.

4.1.4 Knowledge at Time 1 and Time 2

The results of the Lifeskills-Control comparisons at Time 2, immediately after the Lifeskills children had been taken round the scenarios, are given in Appendix 11. Since the Lifeskills children outperformed the Control group children on all but two of the 10 paper and pencil tests of knowledge three months after their visit, it is clear that the Lifeskills training still maintained its effectiveness that long after a visit to the Centre. The Lifeskills-Control comparisons at Time 2 are largely redundant in evaluating the programme and are therefore not reported in the main body of the text.

The two tests in which the Time 2 result is not redundant are Seat Belts and Pedestrian Visibility. These were the only paper and pencil tests that did not show a significant Lifeskills effect at three months (see Table 9). Looking at the Time 2 data (i.e. the children's knowledge immediately after they had been round Lifeskills), there was no evidence of learning on Pedestrian Visibility or Seat Belts. On these tests the Lifeskills children did no better than the Control children at Time 2.

4.1.5 Confidence, order and enjoyment in relation to knowledge

In the paper and pencil test children were asked three questions about confidence. There was a general question which asked "How confident are you that you know what to do in an emergency?" They were also asked whether they would know what to do next if they found a room in their house on fire, and if they came into the kitchen and found it smelled of gas.

Table 13 shows the percentages of children from all groups who reported being "very confident" in response to the general question, and who believed that they "certainly" knew what to do in response to the fire and gas questions.

In both years, a higher percentage of the Lifeskills children were certain that they knew what to do in the event of a fire or gas emergency as compared to the Control children. Few children reported high levels of general confidence in either group in Year 7, and there was no significant difference between the Lifeskills and Control groups in the percentages of children at the highest levels of general confidence in either Year 6 or Year 7.

There was no relationship between knowledge and confidence about knowledge, except in the Year 6 Lifeskills group where Gas confidence and Gas knowledge were appropriately related. The more confident Year 6 Lifeskills children did have a better idea about how to react in the event of a gas leak. (See the Table in Appendix 14 which shows the relation between confidence and knowledge for the Fire and Gas scenarios).

This lack of association between confidence and knowledge is in contrast to the corresponding results for confidence and performance where the expected relationship was found amongst Lifeskills children, i.e. those who displayed more confidence (reacted faster) also performed better on the tasks themselves.

In summary, in both the reaction time and the paper and pencil measures of confidence, the results show that the Lifeskills children had more confidence than the Control group children. But Lifeskills children who reported on the paper and pencil test that they were confident about knowing what to do, did not in fact know more than Lifeskills children who said they were not so confident. This lack of relation may occasion some concern since misplaced confidence is potentially dangerous. The performance reaction time results however offer reassurance since in that case the children's confidence was justified i.e. the more confident Lifeskills children

Table 13: Confidence in knowledge - Year 6 & Year 7 data, Lifeskills/Control comparison, Percent of children at highest level of confidence

	Year 6				***Year 7***			
	Control	Lifeskills	χ^2	P	Control	Lifeskills	χ^2	P
N	121	376			199	298		
General Confidence	21%	31%	4.95	NS	14%	14%	0.03	NS
Fire Confidence	26%	44%	12.78	***	26%	41%	11.20	***
Gas Confidence	16%	37%	18.68	***	12%	27%	16.30	***

Shading signifies a statistically significant difference between Control and Lifeskills groups.
**p < 0.01 ***p < 0.001

performed better than the less confident. If 'actions speak louder than words' the justified hesitation or lack of hesitation of Lifeskills children on the performance tests is a better index than their self-report of how likely their confidence is to instigate action. As such the extra confidence instilled by the Lifeskills visit does relate to extra knowledge, and is likely to help the more knowledgeable children to put their knowledge into action if they are faced with an emergency.

At the end of their visit to Lifeskills, the children were asked on the paper and pencil test which scenario they had enjoyed the most, and which they visited last. The latter question revealed the order in which they had gone round the scenarios. Analyses showed that neither order nor enjoyment had any effect on knowledge on any test topic three months after their visit. This analysis could not be carried out on the Year 7 children as they were not part of the initial evaluation and therefore no data were gathered at the time of their visit to Lifeskills.

4.1.6 Comparing performance and knowledge

Tables 14 and 15 summarise the results for both performance and knowledge. Table 14 shows the percentage of each group with perfect achievement on the various tests. Table 15 shows the groups' average scores standardised out of 10 to facilitate comparison across scenario and type of test. Tables 14 and 15 include all four sets of results so far reported. Two sets cover the observational tests of children's performance, one on-site at the Lifeskills Centre, the other off-site at Chew Stoke. The tables also include the results from the paper and pencil test of children's knowledge in Year 6, three months after the Lifeskills children's visit to the Centre, and Year 7, 12 months on average after the Lifeskills children's visit.

Table 14: Performance and Knowledge, Percent of Control/C and Lifeskills/L children with perfect achievement

	Performance				***Knowledge***			
	Observation Off-site		Observation On-site		Paper/pencil Year 6, At Time 3		Paper/pencil Year 7	
	C	L	C	L	C	L	C	L
N	46	148	48	72	121	376	199	298
Water (what to do)	0%	3%	0%	1%				
Water (what not to do)	0%	5%	0%	0%				
Gas(what to do)	4%	25%	0%	19%	2%	21%	5%	10%
Gas(what not to do)	2%	22%	2%	15%	25%	52%	22%	33%
Fire	0%	9%	0%	10%	21%	44%	16%	24%
Bedroom					3%	15%	3%	4%
Kitchen	85%	80%	73%	85%	45%	67%	33%	55%
Recovery Position	0%	0%	0%	1%	59%	94%	69%	75%
Car Stopping Distance	2%	34%	0%	38%	23%	89%	36%	69%
Seat Belts					50%	60%	50%	57%
Pedestrian Visibility					30%	35%	25%	31%
Drugs					6%	44%	29%	19%

Shading signifies a statistically significant difference between Control/C and Lifeskills/L groups.

Table 14 displays the results in terms of the percentage of children with perfect achievement on the various tests and shows that children did better on the paper and pencil tests of knowledge than on the observational tests of performance. Relatively few children achieved a perfect performance on any of the observational tests with the exception of the Kitchen hazards.

Across all observational performance tests on- and off-site:

- Hardly any Control group children achieved a perfect score, with the exception of the Kitchen test.
- On over half of the tests at least 10% of Lifeskills children achieved a perfect score.

Table 15: Performance and Knowledge, Control/C and Lifeskills/L children's scores, standardised/10.

	Performance				***Knowledge***			
	Observation Off-site		Observation On-site		Paper/pencil Year 6 At Time 3		Paper/pencil Year 7	
	C	L	C	L	C	L	C	L
N	46	148	48	72	121	376	199	298
Water	1.93	3.84	2.14	3.40				
Gas	3.38	5.42	2.20	4.92	4.34	6.44	4.54	5.40
Fire	3.10	5.66	4.30	5.86	6.58	7.80	6.10	6.70
Bedroom					6.74	7.27	6.21	6.53
Kitchen	9.69	9.61	9.43	9.74	8.67	9.34	8.07	8.96
Recovery	2.64	3.88	2.58	4.18				
Car Stopping Distance	4.36	7.82	5.78	8.90	8.89	9.91	9.27	9.57
Seat Belts								
Pedestrian Visibility								
Drugs♦					6.86	8.48	8.24	7.63

Shading signifies a statistically significant difference between Control/C and Lifeskills/L groups.

♦ On the Drugs test, the Control group had a higher score than the Lifeskills group in Year 7.

Across the knowledge tests:

- the average percent of Control group children achieving a perfect score in Year 6 was 26% In Year 7 the average was 29%.
- the average percent of Lifeskills children achieving a perfect score in Year 6 was 52% . In Year 7 the average was 38%.

Table 15 displays the results in terms of the standardised average scores, and gives the same picture as the percentages in Table 14. They show superiority of knowledge over performance in all cases except the Kitchen task. Although this knowledge-performance disparity was common to both the Lifeskills and the Control groups, it was somewhat greater for the Controls.

- The overall mean averages for performance (on- and off-site combined) were: Control 4.31; Lifeskills 6.15.

- The overall mean averages for knowledge were: Control (Year 6) 7.01, (Year 7) 7.08; Lifeskills (Year 6) 8.21, (Year 7) 7.47.

There were four scenarios with scores both for observational performance tests and for paper and pencil knowledge tests. These were Gas, Fire, Kitchen and Road distance. A univariate analysis of variance was carried out for each of these four scenarios to compare the Year 6 Lifeskills and Control groups' knowledge and performance post-intervention. Data from the Year 7 children were excluded as they were gathered at 12 months unlike the remainder of the scores which were gathered at three months. For the analyses of variance the performance scores included both the on-site and off-site data.

These analyses allow us to compare Lifeskills overall (performance and knowledge) scores with Control group overall scores, performance scores with knowledge scores, and their interaction (i.e. whether the Lifeskills intervention had more impact on performance or knowledge). Figure 2 overleaf has graphs for all four scenarios, showing the relative scores on performance and knowledge for both the Lifeskills and Control groups.

- On all four scenarios, the analysis showed that the Lifeskills group's score was significantly superior to the Control group's score.
- The analysis also showed that for three of the four scenarios (Gas, Fire and Car Stopping Distance) knowledge scores were significantly superior to performance scores. In contrast, for the Kitchen scenario the performance score was significantly superior to the knowledge score.
- There were also significant interactions between type of test and group for all except the Gas scenario (F values: Gas 2.01, Fire 6.62, Kitchen 8.20, Car Stopping Distance 88.54; df 1/809 in each case; $p < 0.01$ for all except Gas). The significant interactions are apparent in the steeper slopes between performance and knowledge for the Control group line than for the Lifeskills group line.

Taken together, these results show that in these four areas Lifeskills and Control children generally achieved higher scores on the knowledge tests than on the performance tests, but the disparity between knowledge and performance was greater for the Control group than for the Lifeskills group. This means that the Lifeskills group outperformed the Control group more conclusively on the performance tests than on the knowledge tests.

4.1.7 Performance and knowledge effect sizes

The analyses comparing the Lifeskills and Control groups' performance and knowledge reported previously have shown that the Lifeskills programme is achieving statistically significant success. By the perfect achievement index Lifeskills children outperformed the Control children on the majority of the tests. By the average score index the results were even more striking as the Lifeskills children significantly outperformed Control children almost invariably. But how large were these effects?

Effect sizes are shown in Tables 16 and 17. Those in Table 16 derive from the χ^2 values already reported. Those in Table 17 derive from the *F* values already reported. It is the convention to regard effect sizes for χ^2 as medium if they are .09 to .24 and large if they are .25 or above.. Effect sizes for *F* are regarded as medium if they are .06 to .13 and large if they are .14 or above.[36]

Figure 2: Graphs comparing Lifeskills and Control children's Performance and Knowledge, by score index, on 4 scenarios

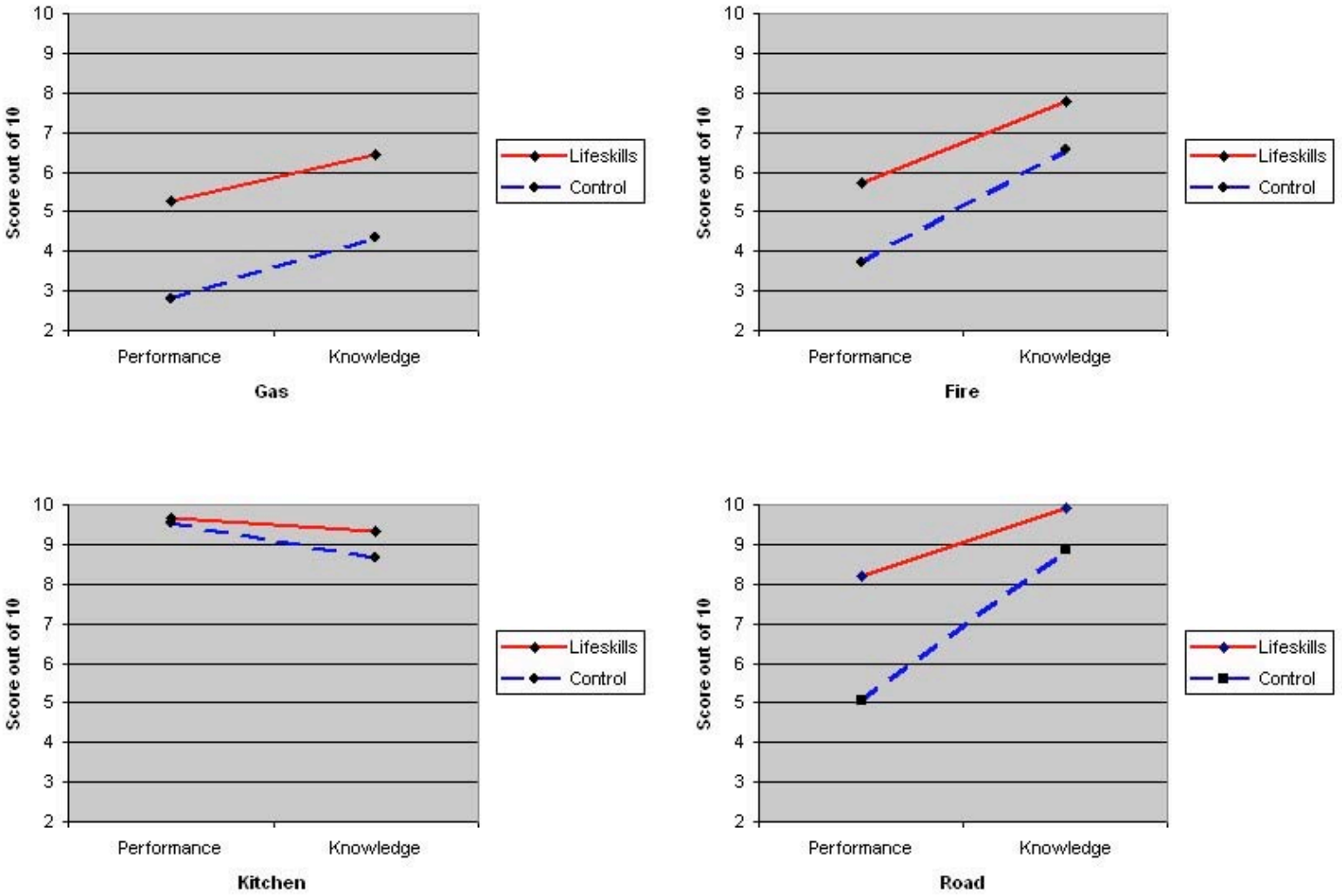


Table 16: Effect sizes for Performance and Knowledge, derived from comparisons of percent of Control/C and Lifeskills/L children with perfect achievement

	Performance				***Knowledge***			
	Observation Off-site		Observation On-site		Paper/pencil Year 6 At Time 3		Paper/pencil Year 7	
	C	L	C	L	C	L	C	L
N	46	148	48	72	121	376	199	298
Water (what to do)	NS		NS					
Water (what not to do)	NS		NS					
Gas (what to do)	$.06^{+}$		$.13^{++}$		$.05^{+}$		NS	
Gas (what not to do)	$.06^{+}$		$.06^{+}$		$.06^{+}$		$.02^{+}$	
Fire	$.04^{+}$		$.06^{+}$		$.04^{+}$		NS	
Bedroom					$.02^{+}$		NS	
Kitchen	NS		NS		$.04^{+}$		$.05^{+}$	
Recovery	NS		NS		$.17^{++}$		NS	
Car Stopping Dstance	$.13^{++}$		$.26^{+++}$		$.40^{+++}$		$.11^{++}$	
Seat Belts					NS		NS	
Pedestrian Visibility					NS		NS	
Drugs					$.10^{++}$		NS	

Key + small effect size, ++ medium effect size, +++ large effect size

It is clear from Table 16 that in attempting to increase the numbers of children able to achieve perfect scores either for knowledge about hazards and emergencies or for acting correctly to deal with them, the Lifeskills programme did produce effects on more than half the tests (i.e. 19 out of 36 tests). However the majority of the test effects (63%, 12/19) were small.

Of the 36 Lifeskills-Control comparisons listed:

- 2 effects (both for Road distance) were large
- 5 effects were medium
- 12 effects were small
- 17 comparisons showed no statistically significant effects

Performance tests produced one large and two medium effects: Knowledge tests produced one large and three medium effects.

Table 17: Effect sizes for Performance and Knowledge, derived from comparisons of scores of Control/C and Lifeskills/L

	Performance				***Knowledge***			
	Observation Off-site		Observation On-site		Paper/pencil Year 6 At Time 3		Paper/pencil Year 7	
	C	L	C	L	C	L	C	L
N	46	148	48	72	121	376	199	298
Water	$.15^{+++}$		$.13^{++}$					
Gas	$.10^{++}$		$.23^{+++}$		$.14^{+++}$		$.02^{+}$	
Fire	$.17^{+++}$		$.11^{++}$		$.05^{+}$		$.01^{+}$	
Bedroom					$.01^{+}$		NS	
Kitchen	NS		NS		$.05^{+}$		$.06^{++}$	
Recovery	$.05^{+}$		$.12^{++}$					
Car Stopping Distance	$.31^{+++}$		$.46^{+++}$		$.31^{+++}$		$.02^{+}$	
Seat Belts								
Pedestrian Visibility								
Drugs♦					$.09^{+}$		$.02^{+}$	

+ small effect size, ++ medium effect size, +++ large effect size

♦ On the Drugs test, the Control group had a higher score than the Lifeskills group in Year 7.

Table 17 in contrast shows that the Lifeskills programme had many large effects on the scores children managed.

Of the 24 Lifeskills-Control comparisons listed:

- 7 effects were large
- 5 effects were medium
- 9 effects were small (one of which showed an inappropriate small effect – i.e. Year 7 Drugs, where the Control group knew more than the Lifeskills group).
- 1 comparison showed no statistically significant effect
- Of the 12 medium and large effects, three occurred in the knowledge score comparisons and nine occurred in the performance score comparisons. This supports the conclusion that the Lifeskills programme had more impact on the children's performance scores than on their knowledge scores (i.e. produced a greater difference between the Lifeskills and Control children).

It is not entirely clear how to interpret the differences between the knowledge test results and the performance test results. As we have seen, in terms of absolute levels of results, both the Lifeskills and the Control children did better on the paper and pencil tests than on the observational tests. Why? One possibility may be that success on the paper and pencil tests requires only knowledge while success on the observational tests requires both knowledge and something extra such as the self-confidence to put that knowledge into practice. A second possibility is that the paper and pencil tests are easier because they place a lesser burden on memory. Many of the paper and pencil tests require children to choose among alternative possible answers. As such they are tests of recognition. The observational tests do not provide a circumscribed set of alternatives. The child must remember what to do without the assistance of pictorial prompts. In other words the observational tests are tests of recall not recognition. It is a well-established research finding that recall tests generally produce lower scores than recognition tests of the same material.

These two interpretations of the differences between the paper and pencil test and the observational tests are not mutually exclusive. The observational tests may make more demands on memory and may also require that the children feel confident enough to put their knowledge into practice. Certainly the results of the evaluation show that the Lifeskills experience significantly increased children's confidence on the majority of scenarios. It also showed that the Lifeskills children's confidence was not misplaced since the higher the degree of confidence, the greater the degree of competence. This confidence may have helped the Lifeskills children to put their knowledge into practice as psychological research suggests that people require confidence in a given skill before they can put that skill into practice[37].

Regardless of how the differences between the two types of tests are interpreted, the effect sizes reported above show that the Lifeskills experience produces a small increase in children's knowledge but it markedly increases children's capacity to make use of that knowledge if they need to.

4.2 LEARNING IN DIFFERENT SAFETY AREAS

This section provides further detailed information about the children's performance and knowledge in six key safety areas: Water safety, Home safety, Fire safety, Road safety, First aid, and Drugs.

The design of the evaluation involved testing children three times. The Lifeskills group were given a paper and pencil test immediately before and immediately after their visit to Lifeskills. Three months later, they were assessed a third time either by an observational test or again by the paper and pencil test. The Control group were also given the paper and pencil test twice (in school, with a two-hour interval between) and three months later either by the paper and pencil test again or by an observational test. The instruments are shown in Appendix 3 and Appendix 5.

The following discussion will focus on children's performance and knowledge at three months. For performance, the discussion will focus on the assessments conducted off-site at the Chew Stoke Pumping Station as these provide a more stringent test of the children's performance skills than the on-site assessment. (The detailed tables in Appendix 12 also present the on-site data for comparison purposes).

In addition, data gathered during the focus group discussions are presented here. There were three kinds of discussion groups – groups conducted with Lifeskills and Control children on the occasion of observational testing on-site, and discussion-only groups held at school. The latter groups involved children who had not been to the Lifeskills programme and were not included in any other part of the current evaluation.

Children in all focus groups were asked what they thought were the most dangerous risks facing children of their own age. Spontaneous comments children produced about the safety areas covered by the tests in the evaluation are cited in the relevant sections for each test. Some of the children's comments about other areas of risk are also noted at the end of Section 4.2.

4.2.1 Water safety

The findings reported below relate to the actions of the children during the observational tests at Chew Stoke Pumping Station. The paper and pencil tests did not include questions about water safety. Children were asked to show what they would do if they saw someone in a river calling for help.

Main findings

- Only 5% of the Lifeskills children went into the water compared with 70% of the Control children. When asked if there was anything dangerous for them to do, 71% of Lifeskills children stated that they should not go in to help someone. Only 21% of the Control group mentioned this.
- Over 90% of the Lifeskills children attempted to reach out to the person in the water but 68% of them stood up while reaching out. Only 24% of Lifeskills children knelt or lay down while reaching out. When asked if there was anything dangerous for them to do only 19% of the Lifeskills children mentioned that they should not reach out whilst standing up.
- A few Lifeskills and Control group children mentioned water hazards in the focus groups. Comments related to children falling into water and being swept away by the current or tide, or playing in shallow water and getting into difficulty. These were posed as

theoretical risks, with only one child giving an example of an incident within their own experience. Water was not mentioned as a risk at all by the Control 'discussion-only groups'.

- 69% of the Lifeskills children threw a floating object into the water to be used as a buoyancy aid, while only 22% of the Control group did.
- Approximately 50% of the children in both groups attempted to seek help. But only about 10% called out to reassure the person in the water.
- 12% of the Lifeskills children mentioned not going into someone else's house when seeking help compared with no children in the Control group.

Focus groups' comments

- A few Lifeskills and Control group children mentioned water hazards in the focus groups. Comments related to children falling into water and being swept away by the current or tide, or playing in shallow water and getting into difficulty. These were mentioned as hypothetical risks, with only one child giving an example of an incident from their own experience. Water was not mentioned as a risk at all by the 'discussion-only groups'.

4.2.2 Home safety [dealing with a gas leak and making a kitchen safe for a toddler]

Gas safety

These findings relate to data collected by observational and paper and pencil tests. In each, children were asked what they would do and what they should never do if they came into the kitchen and smelled gas. On the paper and pencil test they had to select appropriate and inappropriate actions from a set shown in pictures.

Main findings

- In the paper and pencil test, the Lifeskills children showed greater knowledge than the Control children about dangerous actions. About 70% of the Lifeskills compared with about 50% of the Control children indicated that you should not use a mobile in the house or switch off lights/appliances when there is a gas leak.
- In the observational test, the number of Lifeskills children stating that lights/appliances should not be switched on or off was only 56% and 17% made the mistake of switching appliances off. Similarly the number of Lifeskills children stating that a mobile should not be used in the house was only 29% in the observational test and 12% made the mistake of using a mobile in the house to phone for help. There was very little difference between the Lifeskills and the Control group on these items in the observational test.
- The Lifeskills children were more aware than the Control children about things you should do (turn off the gas, open a window, and phone Transco for help using a house line) on both the paper and pencil tests and the observational tests. Typically 50%-75% of Lifeskills children selected these actions, whereas fewer than 50% of the Control group did.

Focus groups' comments

- In the focus groups, a few children mentioned gas as posing a dangerous risk for children their age. Most of those who mentioned gas as a risk were from Lifeskills schools with a catchment area in a relatively disadvantaged neighbourhood. No-one knew of any incidents involving gas, and few children spoke about the nature of the risk posed.

- One child said that the gas procedure taught by Lifeskills was more confusing than the fire procedure.

Kitchen safety

These findings relate to data collected by observational and paper and pencil tests. On the observational test children were asked to rearrange a kitchen to make it safe for a toddler. On the paper and pencil test they were asked to draw a circle round each dangerous item shown in a picture.

Main findings

- Children in both the Lifeskills and the Control groups did very well on the observational and paper and pencil tests of kitchen safety.
- In the observational test, all but one of the hazardous items were either partially or fully rectified by 89%-99% of the children. The one item frequently not noticed as a hazard was an overhanging garment on an ironing board.
- On the paper and pencil test, the only items not to be noticed by 85% or more children were the kettle and the bleach – and this only in the Control group.
- In terms of rectifying hazards during the off-site test the majority of children repositioned the cup, the pills, the kettle and the knife so that they were completely safe.
- The iron was only made completely safe by 42% of the Control and 45% of the Lifeskills children. The remaining children made it partially safe by placing the flex on the board but not removing the iron to a safer place.
- The chip pan was only made completely safe by 26% of the Control and 31% of the Lifeskills children. Sixty three per cent of Control and 57% of the Lifeskills children made the chip pan only partially safe, i.e. they turned the handle away from the front of the stove but did not move the pan itself away from the front of the stove to a back burner.
- More than 90% of the children shut the bleach behind a cupboard door (i.e. partially safe) but very few children commented that the cupboard containing dangerous substances like bleach needed a child-proof lock.

Focus groups' comments

- In the discussion groups, a few children, mostly from the Control group schools, commented that the home environment may present dangerous risks for children their age. By and large children discussed these as hypothetical risks rather than ones they had actually experienced. Chemicals, burns, scalds and staircase hazards were all mentioned.
- The home environment was believed to present some of the most dangerous risks for younger children. All focus groups mentioned this. The risks envisaged were burns and scalds from hot pans, risks associated with appliances and dangling wires, chemicals and drugs left lying within a small child's reach, and cuts from knives and objects children pull down from high places. Although most hazards were cited as hypothetical rather than from personal experience, the richness and variety of both the Lifeskills and Control children's understanding of kitchen hazards is in line with their success on both the knowledge and performance in the kitchen scenario.

4.2.3 Fire safety (carrying out a fire ecsape plan and spotting fire hazards in a kitchen).

Fire escape plan
These findings are based on data collected by observational and paper and pencil tests. In the observational test children opened a door and found the room behind it 'on fire'. In the paper and pencil test children were asked what they would do if they opened a door and found the room behind it on fire. They had to select appropriate actions from a set shown in pictures and put them in the correct order.

Main findings

- On the paper and pencil test, over 70% of both Lifeskills and Control children scored well with regard to slamming the door as their first action on discovering a fire. For the Lifeskills children, 80% shut the door to the fire on the performance test. In contrast only 26% of the Control children did this in the performance test.
- Fewer that 20% of either Lifeskills or Control children shouted 'fire' in the performance test although 81% of Lifeskills children and 58% of Control children selected shouting fire as one of their appropriate actions in the paper and pencil test.
- 53% of the Lifeskills children got down low in the performance test. Only 4% of the Control children did this.
- On the paper and pencil test, 93% of Lifeskills and 92% of Control children recognised that leaving the house is an important action. During the observational tests 69% of Lifeskills children, but only 35% of Control children left the building in response to fire.
- On the paper and pencil test about 90% of children in both groups indicated that they would phone for help from an outside telephone. On the observational test 97% of Lifeskills and 83% of Control children phoned for help. However, only 37% of Lifeskills children used the outside phone for this call during the observational test. Even fewer of the Control group (11%) used the outside phone to call for help.
- Of the children who made a telephone call, 94% of Lifeskills children (and 80% of Control children) correctly dialled 999 and similarly high percentages requested the fire service. 76% of Lifeskills children gave the right phone number (compared with 54% of the Control group).
- In the paper and pencil test, 20% of Lifeskills children selected the picture indicating that they would rescue their dog before leaving the house. This number was even higher (40%) in the Control group.

Focus groups' comments

- In the focus groups, a few children (mostly from the Lifeskills groups) mentioned fire as posing a dangerous risk for children their age. The risk was described as 'getting burnt' or inhaling smoke but there was no mention of personal experience of such incidents.
- Those children who did discuss fire as a risk believed that the risk came from them not knowing what to do to avoid or handle a fire; all such comments came from children in Lifeskills groups.

Noticing fire hazards in a bedroom
Findings in this section relate to analysis of the paper and pencil knowledge tests at three months. There was no observational test of the children's capacity to spot or remove hazards in a

bedroom. In the paper and pencil test they were asked to draw a circle round each dangerous thing in a picture.

Main findings

- Over 96% of the children in the Lifeskills and the Control groups spotted the dangers of a plug/flex, cigarettes and the electric fire.
- 62%-65% of all the children spotted hazards relating to the lamp and electric blanket, and approximately 50% spotted the matches in the picture.
- 50% of the Lifeskills children compared with only 11% of the Control children spotted the flower vase on the TV as a potential hazard.

Focus groups' comments

- In a focus group one child described how younger children learn to strike matches by copying parents who smoke.

4.2.4 First aid

These findings are based on both the observational and the paper and pencil tests, but the two types of test made completely different demands. On the observational test the children were asked to put 'an unconscious person' in the position they should put him/her in before going to get help. On the paper and pencil test children were asked to select which of four pictures showed the correct position to put an unconscious person in before going to get help.

Main findings

- The Lifeskills children did a great deal better than the Control children at recognising the Recovery Position in the pencil and paper test, i.e. 96% of the Lifeskills children compared with 55% of the Control children recognised the position correctly.
- In the off-site observational tests, however, no-one in either the Lifeskills or the Control group was able to place "an unconscious person" in the Recovery Position, although 77% of the Lifeskills children and only 52% of the Control children did place the person on his/her side before going to get help.
- 32% of Lifeskills children positioned the person's shoulder appropriately so that the body remained stable
- Very few of the Lifeskills (or the Control) children placed the person's knee in the appropriate position or checked the jaw position.
- Fewer Lifeskills children than Control group children were aware that they had not succeeded in placing the "injured person" in the correct position.

4.2.5 Road Safety [Car stopping distance, rules about seatbelts, and pedestrian visibility in darkness or fading light]

Car stopping distance

These findings relate to data collected by observational and paper and pencil tests. In the observational test children were asked to stand on the roadside at the place where they thought the car in the exercise would stop if it were travelling at 30 mph and braked as hard as possible. The paper and pencil test had a picture of a car approaching. The children were asked to mark the point on the road where the car would stop if it were travelling at 30 mph and braked as hard as possible.

Main findings

- In the observational test 98% of the Control children considerably under-estimated the safe stopping distance of a car. 55% of Lifeskills children were correct or nearly correct.
- In the paper and pencil test, 95% of the Lifeskills children were correct or nearly correct as compared to 43% of the Control children.

Focus groups' comments

- In the focus groups, most children across all groups mentioned roads as posing the most dangerous risk for children their age. The risks were associated with walking, running or - less often - cycling on the roads, with only a few comments about risks to vehicle passengers. Only a small number of children had personally been involved in road accidents or near misses.
- One clearly perceived danger was crossing roads and risking being knocked down by a vehicle. During discussions, a number of children demonstrated that they knew about safe places to cross such as by pelican crossings or traffic lights and not at corners, although none mentioned other hazardous places such as between parked cars. Some admitted that they sometimes crossed in less safe places.
- Some groups mentioned that children have less experience than adults and may not have a true appreciation of the real dangers. Some commented that children sometimes do not notice traffic or pay attention. They described how they talk to each other, or are thinking of other things, and that this lowers their awareness.
- A few children believed that car speeds were a key factor in relation to risk. They seemed aware that the greater the car speed the greater the risk of injury or death to a child on the road and so they argued that main or busy roads were riskier than quiet ones. Two children mentioned that children their age find it hard to assess car speed when crossing the road.
- Several groups discussed variations in traffic flow e.g. that there was a 'rush hour', that some roads contain more lorries and vans than others, and that motorways have different speed limits from ordinary roads.
- A number of groups raised the issue of boys in particular playing 'dare' or 'chicken' when crossing roads – games involving peer pressure not to show fear. Boys and girls, in two groups in particular, believed that boys generally take more risks when crossing roads, for example, dashing across when cars were close, believing their running ability will enable them to get across before traffic came. The view (mostly expressed by girls) that girls are more cautious on roads was not challenged.
- Many groups believed that playing games such as football in the road places children of their age at risk. Key risks cited were concentration on the game rather than the road and dashing suddenly into the road for a stray ball.
- Media messages delivered via road safety adverts on TV were vividly recalled by a few children who could describe advertisements showing children getting knocked down. One girl thought that because there were lots of road safety adverts on TV, this indicated that the risks they described were high.

Seat belts

There was no assessment of use of seat belts in the observational test. Findings in this section relate to analysis of the paper and pencil knowledge test at three months. Children were asked to tick the one or more of five pictures they thought represented safe use of seat-belts. Only one was safe (one person - one seat belt).

Main findings

- Ninety five per cent of Lifeskills and 94% of the Control children ticked the one person – one seat belt picture. In addition 97% or more of the children recognised that a child being unstrapped in a car was unsafe.
- 60% of Lifeskills and 50% of Control children recognised that one-belt per person was the only safe mode of travel.
- Approximately 25% of Lifeskills children and 33% of Control children thought that any kind of restraint was safe (for example sitting on another passenger's knee and sharing a seat belt).

Focus groups' comments

- During the focus group discussions many children mentioned the risk of being a pedestrian but only a few children mentioned that being a vehicle passenger posed a potential risk. Such children cited the risk associated with travelling at high speed while not wearing a seat belt, and risks from other drivers who might have been drinking.

Pedestrian visibility

There was no assessment of the children's understanding of pedestrian visibility in the observational test. Findings in this section relate to analysis of the paper and pencil knowledge tests at three months. Children were shown five pictures of different levels of light and darkness. All were from the viewpoint of a car driver. Children were asked to tick whichever of the five pictures showed a level of light/darkness at which there was a danger of the pedestrian not being visible to the car driver.

Main findings

- Ninety eight per cent of Lifeskills and 99% of the Control children recognised that complete darkness reduces the visibility of pedestrians to drivers.
- Only 71% of Lifeskills and 78% of the Control children appreciated that partial darkness does so too.
- Further, only 39% of Lifeskills and 30% of the Control children appreciated that fading light was also a hazard.
- In summary, Lifeskills children had no greater appreciation of the visibility risk to pedestrians of partial darkness and failing light than the Control group children.

Focus groups' comments

- Children in two of the focus groups stated that night-time poses dangers for pedestrians. But one of these groups felt that this risk is not relevant for children as they are not out at night. No groups specifically mentioned fading light or partial darkness as posing any risk.
- Children in one focus group (from a Control group school with a catchment area in a relatively disadvantaged neighbourhood) had a discussion about the need for pedestrians to wear reflective clothing/equipment at night. However, no-one in the group possessed any such equipment.
- Wearing reflectors and cycle helmets were mentioned as possible safety measures, although no-one mentioned actually using them on a regular basis.
- Some groups felt that because younger children were physically smaller, car drivers would not see them if the children went on the road. The children suggested that younger children were less aware of the potential risks, with some comments suggesting that their lack of safety education placed them at greater risk.

4.2.6 Drugs safety

There was no assessment of drugs safety in the observational tests. Findings in this section are based on analysis of the paper and pencil knowledge test at 3 months and to discussions in the focus groups. On the paper and pencil tests children were given a list of drugs and asked to allocate each to one of 4 categories: medical drug, illegal drug, legal and commonly used drug, and not a drug. There was also a response option "don't know".

Main findings

- In the paper and pencil test 86% or more of children in both the Lifeskills and the Control groups correctly classified Heroin, Cannabis and Paracetemol.
- 75% of Control and 86% of Lifeskills children classified Ventolin correctly.
- 80% of the Lifeskills children compared to 64% of the Control children correctly classified Ecstasy. 78% of Lifeskills children compared with 50% of Control children classified alcohol as a drug.
- 70% of Control and 86% of Lifeskills children classified Cigarettes correctly
- The most striking difference between the Lifeskills and the Control children was in the classification of Coffee with 69% of Lifeskills as compared to only 18% of the Control group children correctly classifying it as a "legal and commonly used drug".

Focus groups' comments

- A small number of focus groups (mostly those who had attended the Lifeskills programme) discussed the classification of various drugs, sometimes when prompted by the interviewer. There was general acceptance in the groups which discussed this issue that alcohol was a legal drug for adults. Smoking caused some confusion but there was a general view that cigarettes contained a drug. The groups generally seemed to understand the concept that some drugs are medicines and that some medical drugs may harm people for whom they are not prescribed.

4.2.7 Other risks mentioned in the focus group discussions

Abduction

The danger posed by unknown callers was the one element of the Lifeskills' programme given priority by the steering group but not included in the evaluation. Danger from strangers was mentioned spontaneously in focus groups. Several children mentioned abduction as the most dangerous risk which children their age face. Some groups got into detailed and lengthy discussions about the nature of the risk faced and the strategies they thought might lessen the risk. Some children were aware of recent individual cases highlighted by the media, where abducted children had been killed, and the view was expressed that these incidents raised awareness and fear, even though some children argued that this was exaggerated given the actual risk. Many of the children who mentioned the risk of abduction considered it would be greater if they were on their own. Others felt that being aware of the risk and knowing how to refuse to go with people would help to lessen the risk. Two or three children discussed internet chat rooms as places where potential abductors might try to lure children. A few children admitted having experimented with chat rooms. No one in any group knew of any actual incident of abduction in their own personal experience.

A few children across all groups thought that abduction was the most dangerous risk for younger children. Two groups in particular talked at length about the issue. They felt that the risk came from the fact that young children have a lack of self-awareness and understanding of the motives

of others. Some of these children felt that a younger child's urge to wander off placed it at a greater risk of abduction.

A few children across all groups believed that abduction was the most dangerous risk for teenagers. Although the children recognised that the risk lessened as children got older, those that mentioned it felt that older children placed themselves at more risk if they stayed out late at night. Some children discussed teenagers using internet chat rooms, and the way in which they might be drawn into uncertain relationships which might lead them to venture into situations where they might be at risk of abduction.

Fear of scary places and robbery
A few children across all groups mentioned fears about scary places and robbery as posing a dangerous risk for children their age. There were general anxieties about night-time and certain geographical locations.

Trains
A few children mentioned trains and train tracks as posing a hypothetical risk for children of their age. One child gave a particularly vivid account of how he and his friends had alerted police to older children throwing bricks and bottles from a bridge onto oncoming trains.

Falling
Several children mentioned falling over as a dangerous risk for children of their age. Many quoted examples of falling from their own experience. Instances arose largely in outdoor settings – in playgrounds, parks and fields, out of trees and off walls, or in icy or slippery conditions. A few children mentioned falling downstairs at home as a risk for younger children. They attributed falls of younger brothers and sisters to the lack of adequate supervision or safety equipment.

Fighting
A few boys referred to fighting as the most dangerous risk for children their age. Two of them described fights which they had personally witnessed.

Bullying
A few children from schools with a catchment area in a relatively advantaged neighbourhood mentioned bullying as the most dangerous risk they faced. Comments suggested that others could force children their age to do things they did not want to do.

Vandalism
No-one mentioned vandalism as posing a risk for children their age, nor for children younger than them. Several children however described vandalism as posing a dangerous risk for teenagers. The examples given were stealing or being stolen from, smashing windows, car theft, burning cars (a couple of children speaking from personal experience).

Accidents
A few children, mostly from the Control schools, mentioned a variety of accidents which might pose a dangerous risk for children their age, such as getting hit by objects, cigarette burns, scalding or having an accident while playing at a building site. All comments except one were made by children from schools with a catchment area in a relatively disadvantaged neighbourhood. A few children mentioned accidents as a dangerous risk for younger children, e.g. swallowing something or cutting themselves.

Sports injuries
A few children, all from Control schools with catchment areas in a relatively disadvantaged neighbourhoods mentioned sporting injuries as a dangerous risk for children their age. Injuries sustained while playing football or doing bike tricks were often quoted from the children's own experiences.

Other risks
Other risks mentioned by isolated individuals as dangerous for children their own age, were illnesses, pollution risk to health, and playing outside without knowing how to keep safe. Other risks mentioned by isolated individuals as dangerous for younger children were non-specific wandering off and illnesses. One other risk mentioned by a child as being dangerous for teenagers was arguing with parents leading to leaving home.

4.3 FOCUS GROUP DISCUSSIONS OF THE LIFESKILLS PROGRAMME AND DRUGS ISSUES

The focus groups provided the opportunity for children to talk in their own words about a small number of issues, especially about their experience of Lifeskills and also about their understanding of drugs and factors that might lead someone to take drugs. For the latter task a pictorial prompt was used to stimulate discussion. The focus group discussions therefore produce material which is both broader in range and richer in detail than the material provided by the paper and pencil test.

4.3.1 CHILDRENS PERCEPTIONS OF THE LIFESKILLS PROGRAMME

What did the children like most about Lifeskills?

The scenarios which were mentioned by most groups as being liked the most were the fire, shop, train and road, with a few others mentioning the Recovery Position. Similar findings were obtained from the questionnaire children filled in immediately after they had been round Lifeskills (see Figure 3), on which they were asked, 'Which set did you like the most?'

Two main reasons emerged as to why scenarios were the most popular. Firstly, there was enjoyment of the special effects used in some of the scenarios such as the sound effects of a train, a car braking or a fire in a room, or the 'real' smoke coming out of the room that was on fire..

> *'The fire ... It was a bit scary ... I thought it was a real fire for the sound it made.'* Boy, School 5

Secondly, the children enjoyed interactive scenarios, where they or others had to do something, particularly when there was an element of shock or surprise.

> *'I mean like the train, I wanted to go on the track ... I was just so shocked I just stood there.'*
> Girl, School 7

Many children were impressed by how 'realistic' the scenarios were. A few children described how using the phone and speaking to a real person provided a unique opportunity to experience the process of making an emergency call.

> *'... but you got the chance to ring up and say like what really would happen.'*
> Girl, School 4

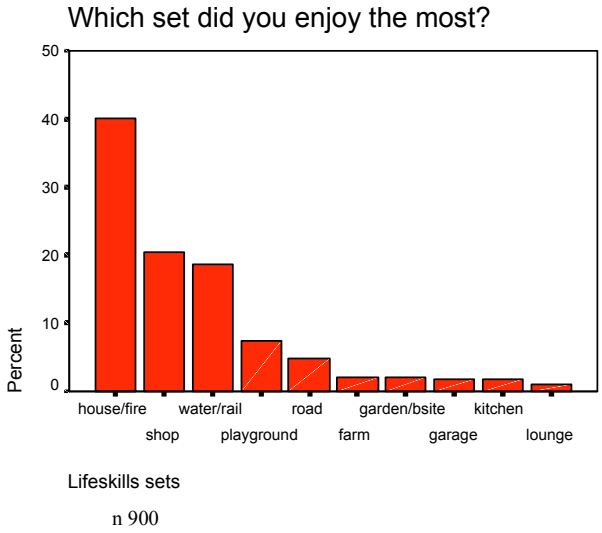
Some of the groups discussed their belief that the interactivity of the programme helped their learning because they were physically engaged with the scenarios.

> *'...it was fun, and it was like, it was just telling you, 'Oh this is what you do in so and so. You experience it yourself ... and you remember more.'*
> Girl, School 5

Several groups discussed the way in which the interactive nature of the tasks in the scenarios was related to real life situations which children might face.

'They make you do the things that you have to do in real life.'
Girl, School 2

Figure 3: Frequency with which different scenarios were picked by children in response to the question asked immediately after they had been round Lifeskills



What did the children like least about Lifeskills?

Although one discussion group could think of nothing that they liked least, all other groups discussed this question. The scenarios mentioned by the majority of groups as being liked the least were the farm, the water and the building site. The majority of children who expressed a reason for liking these scenarios less claimed that there was little for them to do other than listen to the guide. Some children felt that the lack of interactivity or the comparative lack of special effects made these scenarios less exciting.

'I thought the building site ... because you didn't really do it and it wasn't really hands-on.'
Boy, School 5

Other children liked scenarios less because they felt they did not look realistic or convincing.

'Everything was a bit too much set up [the kitchen] ... it's not as realistic as the others, it doesn't make you think so much ... it's too obvious.'
Boy, School 2

A couple of children mentioned feeling confused about the farm safety messages, resulting from the scenario not appearing to present many obvious dangers.

'I didn't like the farm one because it was just all, they seemed pretty safe already, so I don't know really what it was all about ...'
Boy, School 2

When asked what could be done to improve the less-liked scenarios, comments were largely about what physical changes could make them look more realistic or dramatic. Suggestions included placing a drowning dummy in the water and adding sound effects of someone drowning, placing a dummy or falling bricks at the building site, creating a more 'lived-in' kitchen where the dangerous items were integrated into other kitchen features, making the kitchen smell of gas, and making the farm dangers more obvious.

What things did you learn when you came to Lifeskills?

The children were asked to recall something which they had learned during their Lifeskills visit which they had not known before. The majority of groups mentioned remembering learning about the Recovery Position, gas safety information and the car stopping distance. In relation to the Recovery Position in particular, some children commented that although they felt that Lifeskills had taught them things about the procedure which they did not know before, the experience of taking the observational tests had helped them to recognize either that what they had learnt was inaccurate or incomplete, or that they might have forgotten some of what had been taught.

In discussing learning about gas, children mostly mentioned what you should do (particularly switching off the gas) rather than what you should not do (e.g. switching lights on or off). A few of the children mentioned learning about using phones in the context of a gas leak.

> *'Like with the gas, I didn't know there was a gas Hotline, a specific one.'*
> Boy, School 5

Most of those who commented about the road set mentioned that they had learned about car stopping distances. All children who mentioned this said that experiencing the road scenario had taught them that it takes cars longer to stop than they had thought. One girl described how this had helped her to revise what she had previously believed about this from her own experience as a car passenger.

> *'Because when I watch cars when we're braking and going downhill, when it's not wet or anything, we don't really go that far.'*
> Girl, School 7

A number of other things such as sell-by-dates on products in the shop, water and fire safety strategies were mentioned by a few other children as having been learned at Lifeskills.

4.3.2 Discussion of drugs and social pressure

One of the main aims of the focus group discussions was to explore children's ideas about drugs and their understanding of social pressure. The 'trigger task' (see Appendix 8) was used to stimulate discussion. Quotations are used to represent the views of the children and to illustrate the theme under discussion.

The trigger task

The trigger task was a line drawing of teenagers at a party. In the foreground were a boy and two girls talking to each other. They had drinks in their hands. The text said that Vicky and Sue are at a party and their friend Steve joins them. He shows them some small white pills and says: "These

are great. Try one." The focus group children were prompted with questions about the picture and the story, such as, "Do you think that Vicky and Sue are going to try the pills?"

What the pills might be

In response to the trigger task, several groups discussed what the pills that Steve was offering Vicky and Sue might be. Attendance at Lifeskills or the catchment area of the school made no difference to these responses. Three main options were suggested - various types of sweet, headache tablets or illegal drugs. A small number of children suggested that they would have no reliable way of knowing what the pills were.

Will they try the pills?

One of the key questions about the trigger task related to whether or not the groups thought that the girls would try the pills on offer. As a direct response to this question no group thought that the girls would refuse to try the pills. The majority of the groups agreed that they would either definitely try the pills or that they might. Some of the groups had mixed views. For some children, whether or not the girls would try the pills depended on the type of person they were.

> *'If they are sensible they say no but if they're clumsy they might say yes'*
> Boy, Lifeskills, School 4

> *'I think they would 'cos it's obvious that they know what it is because they're teenagers'*
> Boy, Control, School 9

A key question discussed by all the groups was why the girls might try the pills. There was considerable agreement about a range of reasons.

All of the groups discussed the importance of Steve as the source of the pills. There was a strong feeling across the groups that the nature of the girls' friendship with Steve would influence their decision. There was general agreement that if Steve was a good friend then the girls would believe and trust him enough to want to be like him or to impress him. Most groups felt that, as a trusted friend, Steve would not harm them.

> *'If they've got sense they wouldn't …I think they probably will, because like Steve is their friend, so they want to do what Steve's doing'*
> Girl, School 9

Some children felt that the girls would be under pressure to agree to try the pills in order to remain friendly with Steve. There was also widespread agreement that if Steve was only an acquaintance the girls would be less likely to try the pills. This view was more strongly expressed when Steve was thought of as more of a stranger. In this case, many of the groups felt that the girls would be much less likely to try the pills for a variety of reasons. These reasons were linked to a lack of trust in Steve or being scared of him.

> *'I think that if he was their friend then they're more likely to take them than they wouldn't take them, but if he's a stranger then it's 50:50'*
> Girl, School 7

Some groups felt that the girls might well try the pills from Steve regardless of whether or not they knew him. The rationale for this suggested a link with alcohol consumption or whether or not they fancied him.

All the groups felt the girls might try the pills in order to be cool, popular and to impress others. Some felt this allowed desirable access to the 'in-crowd'.

> *'I think they might take them because they're round a lot of people and so they'd be much cooler if they took the pills'.*
> Girl, School 3

Every group spontaneously discussed the influence of alcohol on the girls' decision, suggesting that drinking alcohol was likely to increase the chance of them trying the pills.

> *'If they thought about it they wouldn't try it because they might think that it's drugs. But if they were drunk and then they've got too much alcohol they'll probably just go "oh yeah".'*
> Boy, School 8

Commonly, it was thought that the girls might not want to be teased by their friends or feel left out by saying no. The groups were concerned that the girls might also be threatened, forced or bullied into compliance.

> *'... He probably might be really horrible to them in the future, or hurt them or something'*
> Girl, School 8

Less commonly, the groups thought that the girls might be tempted to experiment with the pills or that they might enjoy the effects of taking them. Most of the groups again linked this decision to the type of people they thought the girls might be. In general, they felt that those with common sense would say no. They identified individuals who would try the pills as risk-taking. They were characterized as people with no sense or who did not care, who wanted to be noticed or who came from a difficult family background. Some groups also felt that the girls might try the pills because everyone else was, because they were persuaded to by others or to appear older. Additional reasons suggested were because the girls might not know anything about drugs, they might not think, they might treat it as a joke or they might believe that nobody would be able to see them take it.

A number of groups suggested reasons why the girls might not try the pills. Common reasons for refusal included not being sure what the pills were, knowing that the pills might be illegal and understanding that drugs might be harmful or dangerous. One child thought that friends might persuade the girls not to take the pills. All the groups were aware that it might be difficult to say no.

What would I do?
Although it was not a primary focus of the discussion, a few groups did talk about their own likely behaviour in the context shown in the trigger task picture. In general there were mixed views about how they would handle a similar situation.

> *'I wouldn't do it, because I wouldn't'*
> Girl A, Control, School 6

> *'I think it'd be quite hard to say no because you'd get teased'*
> Girl B, Control, School 6

General views of drugs
A small number of groups provided general information about their views on drugs and cigarette smoking. Most of these groups reported negative views and the negative opinions were especially common in groups who had attended the Lifeskills programme. More groups discussed specific health risks associated with using drugs, alcohol and cigarettes. Groups of children who had not attended the Lifeskills programme were just as likely to talk about health risks as groups of those who had attended the programme. Comments about health risks were mostly related to major consequences like addiction, diseases such as coronary heart disease and cancer, or death.

Drug risks
When prompted by the interviewer, a number of groups discussed the risk that cigarettes, alcohol and drugs pose. Groups commenting on this were evenly split between those groups which had attended the Lifeskills programme and those which had not. More groups from schools with catchment areas in relatively advantaged neighbourhoods talked about these risks than those from more disadvantaged areas. In general, the perceived risk from these substances increased with increasing age, with younger children considered to be at risk only from drugs, children of similar age considered to be at risk only from smoking and drugs and older children being at risk from drugs, smoking and alcohol. The few groups that thought young children were at risk from drugs categorized this risk as being due to a lack of knowledge.

> *'with like kids of maybe three years old or something, they might find some drugs round the house or something… and they might think it's sweets and they might take one'*
> Girl, Control, School 9

Only a few groups felt that children of similar age to them were at risk from either drugs or smoking. These groups categorized this as a general risk from drugs.

> *'Because the body, at our age, can't handle big drugs'*
> Boy, Control, School 9

They reported mixed views about the risks of smoking for their own age group. Some children knew others of their age who smoked whilst others did not view smoking as a risk at all. A few children reported feeling pressurized to smoke.

> *'I think smoking as well because so many children have friends and they say 'you've got to do it, it'll be really cool'*
> Girl, Lifeskills, School 2

The majority of comments were about the risk to teenagers. There was a view that teenagers were at risk from drugs, alcohol and, to a lesser extent, smoking. These risks were thought to be slightly greater for teenage boys who were characterised as slightly more risk-taking than girls of a similar age. Generally, the groups felt that teenagers were likely to have more independence and freedom which would provide them with the opportunity to access these substances. Several of the groups identified underage drinking and smoking as a problem and could articulate strategies by which teenagers were able to obtain alcohol and cigarettes illegally.

> *'Well the shop, they say that they're old enough or they lie … they could also if they had friends that were old enough to have cigarettes, they could buy some from them.'*
> Girl, Lifeskills, School 5

The children thought that teenagers tended to act in a risky way to rebel from parental authority, as a dare or to be like their friends.

> *'Well, they, the boys, teenage boys could dare the other like to go into a shop and either steal something, or break into a house or take drugs or something'*
> Girl, Control, School 8

The groups held particularly strong views about teenagers in regard to drinking alcohol. They made several observations about the consequences of underage drinking which included getting lost, showing off, fighting, doing silly things and putting themselves in danger.

> *'Because sometimes you don't know what you're doing, smashing your mum's car and stuff like that'*
> Boy, Control, School 8

Direct experiences with drugs
A number of groups talked about their direct experiences with drugs, alcohol and smoking with more groups discussing alcohol and drugs than smoking. Most of the few groups who mentioned smoking were from schools with catchment areas in relatively advantaged neighbourhoods. They reported being offered cigarettes or having seen older siblings, parents or other people known to them smoking. The groups who commented about alcohol reported seeing family members, teenagers and neighbours drinking but had also seen strangers drunk in the street or the park.

> *'Because this man down my street, he lives down the end and once I was like up in my bedroom and I heard something and I was looking out of my bedroom window and I could tell he's drunk because he's like all wobbly and he had to hold onto something to walk and then like when he got near his house he like collapsed'.*
> Girl, Lifeskills, School 5

The majority of the groups talking about their direct experiences of drugs were from schools with catchment areas in relatively disadvantaged neighbourhoods. They reported seeing dealers on the street or at school, had seen drugs in their neighbourhood or had been offered drugs by older children or adults.

> *'... well one of my friends they got, she's got a very big older sister, and she, one time she was out in the car then this girl offered her a sweet, but they weren't really sweets. And she said "Try them, they're not, they can't do anything you know" but it's kind of a trick'.*
> Girl, Control, School 3

One child reported knowing other children who took drugs. Another (from a school in a more advantaged neighbourhood) reported knowing someone who had been expelled from school for using cannabis.

Where drugs are seen
A number of groups had seen drugs in places they used or could report where drugs might be found, although only those groups from schools with catchment areas in relatively disadvantaged neighbourhoods talked from personal experience. The children talked about seeing syringes and needles and bottles and packets of pills in parks and fields where they sometimes played, in

public toilets or near shops and school. In the small number of groups which discussed their own neighbourhood there were mixed views about whether their community had a 'drug problem'.

> *'I live in … and we've got this field right behind us and you go down there under the new bridge that's been built and there's drugs under there.'*
> Boy, Lifeskills, School 4

In response to a question from the interviewer, they also discussed where drugs might be obtained - supplied by dealers, addicts, friends, and at some schools, clubs and parties. A number of groups talked in some detail about drug dealers. Although most of these groups understood the concept of drug dealing, the nature of their comments suggests that their perceptions generally related more to guesswork and imagination than direct exposure. Although some children discussed their own experiences, several children's views seemed more influenced by media images.

> *'In my brother's classroom there's these kids in this class, they're dealers that work with drugs'*
> Boy, Control, School 9

> *'When they go into clubs they like say, maybe they're known because everyone like, has picked up some stuff and they, like they walk past each other and like, slip them into his pocket and stuff. There was this programme. They keep it in their mouth'*
> Boy, Control, School 2

A few children described the effects of taking drugs. They perceived these as behaving badly, losing inhibitions and taking risks.

Strategies for dealing with drug-related risks
A few groups discussed their strategies for dealing with drug risks. Most of these groups were from schools with catchment areas in relatively advantaged neighbourhoods. Generally, these strategies were limited to avoiding 'unsafe' play areas, pretending to join in but not actually joining in, or reporting any incident to the police. Two quotes illustrate the children's confusion about the appropriate action to take on discovering a syringe.

> *'Picked it up by the end, not the needle bit and stuck it in a plastic bag and stuck it in the bin'*
> Boy, Lifeskills, School 4

> *'Leave it. You don't touch it, you just go to a different toilet somewhere else'*
> Boy, Control, School 1

5. DISCUSSION

Since injury is the commonest cause of death in childhood in developed countries [37], it is not surprising that governments and other bodies expend considerable effort in attempting to reduce rates of injury. Some interventions are targeted at bringing about injury reduction through environmental change, as in the case of the modification of road and building/playground design. Other interventions, focused either at the level of the individual or the community, aim to achieve injury reduction through education. In recent years there has been increased interest in evaluation of these interventions to establish satisfactory evidence-based practice [7, 39, 40].

Evaluation exercises have used measures of process (e.g. the intervention programme design), impact (resultant knowledge and behaviour), and outcome (injury reduction) [41]. The Lifeskills programme aims to bridge the gap between safety knowledge and behaviour by teaching children how to assess risks and providing them with the skills necessary to cope with dangers. The current evaluation focused on the programme's impact on children's

- alertness to hazards
- knowledge about preventive measures
- skill at dealing with emergencies
- confidence, especially in dealing with emergencies

The report has so far presented the results of the evaluation primarily in terms of the five safety areas the Evaluation Steering Group nominated for the study: Home, Fire, and Road safety, First aid and Drugs. It is equally important to consider the results in terms of the four types of impact listed above especially as this may increase understanding of the different degree of success the programme seems to be having in different safety area.

Alertness to hazards

The children's ability to notice hazards was assessed for Home safety and Fire safety using the Kitchen and Bedroom tests. The Lifeskills children performed at a significantly higher level than the Control children, but the impact Lifeskills was having was often small.[4]

On the paper and pencil test requiring them to spot hazards in a kitchen Lifeskills children spotted more hazards than the Control group children particularly by recognising that chemical substances such as bleach could pose a danger. The difference between the Lifeskills and Control groups' average scores were small. Three months after their visit to Lifeskills children noticed 6.5 of the seven hazards depicted, while Control group children noticed 6. Twelve months after their visit the Lifeskills children still maintained a similar small but significant superiority. Nevertheless the focus group discussions showed that the Control group children were as aware as the Lifeskills children of the dangers everyday items can pose for younger children. On the performance test both groups did very well. On the Kitchen test therefore all the children were knowledgeable about kitchen hazards even if they had not been to the Lifeskills programme.

On the paper and pencil test, in which the children were asked to spot the fire hazards in a picture of a bedroom, Lifeskills children did significantly better than Control group children. On average Lifeskills children noticed five of the seven fire hazards depicted while Control group children

[4] *It must be noted that with a large sample, as in the current evaluation, statistically significant differences may be found when the effect sizes are small*[42].

noticed 4.7 of them. The most striking difference was that Lifeskills children recognised that a vase of flowers on top of a TV set could pose a hazard. Half the Lifeskills children circled the vase whereas only 11% of the Control children did. Apart from this however Lifeskills is imparting very little new knowledge in the bedroom scenario. Twelve months after their visit, in year 7, there was no longer any diffference between the Lifeskills children and the Control group children, and few children noticed the fire hazard presented by the vase of flowers.

Another scenario in the Lifeskills programme designed to alert children to potential risk is the Drugs classification task. At three months post-intervention, Lifeskills children scored better than the Control children since they had learned to recognise that substances in everyday use such as coffee and alcohol are (legal) drugs. The effect was again small. All children in the evaluation seemed well-informed about other drugs, legal and illegal, and were able to classify them correctly. There were eight drugs to classify. On average the Lifeskills children classified 6.8 correctly while the Control group classified 5.4 correctly. By year 7 there was no difference between the Lifeskills children and the Control group. It is unclear how important it is for children to have learnt that coffee in particular is a drug.

In the focus group discussions many children seemed to know something about illegal drugs as well as the health risks of alcohol and cigarettes. The children also demonstrated that they understood the importance and subtle effects of peer pressure. The need to 'be cool', to impress and to be popular and the negative consequences of teasing, bullying or not 'fitting in' were clearly described. This recognition is obviously not in itself sufficient to protect them against such pressure. We wonder whether Lifeskills should consider refocusing the drugs activity to include an emphasis on the skills children need to resist peer pressure. Reviews of a large number of drugs education programmes for young people have found that more effective programmes included training in assertiveness and refusal skills[43, 44].

Judged by the tests used in the evaluation, the Lifeskills programme is increasing children's alertness to hazards but it appears to be adding only a little to their knowledge base, partly because many of the children already know a fair amount about some topics on which Lifeskills focuses, such as kitchen hazards or classification of medicines. By 12 months after their visit the Lifeskills' children had lost their small advantage over the Control group on two of the three alertness tasks.

Knowledge about preventive measures

The children's knowledge about preventive measures was tested on three aspects of Road safety: car stopping distance, correct use of seat belts, and pedestrian visibility to drivers. The Lifeskills programme was very successful in teaching children about car stopping distance. Both on the performance test and on the paper and pencil test children in the Lifeskills group did significantly better than children in the Control group three months after their visit. The differences between the Lifeskills group and the Control group were large. On the performance test just over a third of the Lifeskills children indicated the correct, 75 feet stopping distance for a car travelling at 30 m.p.h. On average they indicated a distance of 59 feet while the Control group's average was 33 feet. On the pencil and paper test 89% of Lifeskills children were correct and their average score was 74 feet. By year 7 the Lifeskills children still did better than Control group children on the paper and pencil test. By then their scores had deteriorated somewhat, but their average estimate of stopping distance was still 72 feet.

On the paper and pencil test of seat belt knowledge all the children recognised that travelling in a car without wearing a seat belt is unsafe. Approximately half the children knew the 'one person, one belt' rule, but this number was not significantly improved by the Lifeskills programme.

On the paper and pencil test of their understanding of pedestrian visibility nearly all the children recognised that a driver may find it difficult to see a pedestrian without reflective clothing in complete darkness. Two thirds recognised that the car driver would have similar problems in partial darkness, and one third recognised that the car driver would have similar problems in fading light. These numbers were not significantly improved by the Lifeskills programme.

The evaluation assessed the effectiveness of the Lifeskills programme in teaching Road safety knowledge entirely in terms of preventive measures. The prevention of road accidents is the major area of concern for any educational health intervention with children since about half of all accidental deaths of children under 15 in the UK are caused by road accidents. The effectiveness of the Lifeskills programme was mixed. It was extemely successful in teaching the children about car stopping distance. They understood this far better than the Control group children and retained a sound grasp of it 12 months after their visit. This should therefore have increased the children's capacity to cross the road more safely. In contrast the Lifeskills programme had little impact on improving children's knowledge of the correct use of seat belts or the difficulties drivers have in seeing pedestrians in darkness or fading light.

We suggest that the road safety messages about seat belts and pedestrian visibility should be taught more interactively and with more emphasis on helping children to understand the principles underlying the effectiveness of seat belts and reflective clothing, since learning has been shown to be enhanced by teaching which articulates why the rote rule is appropriate [45]. For example children need not just to know that it is unsafe for two people to travel in one seat belt but also to understand ***why*** it is unsafe.

Skill at dealing with emergencies

The children's ability to deal with emergencies was assessed in the Water, Gas, Fire and First Aid/Recovery Position tasks, all of which were tested with role-playing performance measures as well as paper and pencil measures. The Lifeskills children scored better than the Control children on all these tasks particularly on the performance tests in which they were required to act out the apprpriate procedures rather than simply say what they would do.

On the water-rescue task few children could adequately act out how they would react if they came across a person in trouble in a river. Nevertheless the Lifeskills children outperformed the Control children. In particular they had learned not to go into the water themselves and to throw in an object to help the person float. The absolute level of the Lifeskills' children's performance was not high. They had learned to reach out with a suitable object such as an umbrella, but they were likely to do so while standing up rather than lying down. The fact that the right and wrong ways of doing an act could so easily be confused may have accounted for the children's relatively poor scores.

On the gas emergency task the Lifeskills programme is doing well. Three months after their visit children in the Lifeskills group did significantly better than children in the Control group on all measures. The Lifeskills children were better than the Control children at opening a window, turning off the gas at the mains, using the landline/house telephone to report a gas emergency and stating that a mobile phone should not be used near a gas leak. There was however little sign that Lifeskills is teaching children who do not already know about the danger of switching electrical appliances on or off during a gas leak. Futhermore although Lifeskills is teaching children about the dangers of using a mobile phone near a gas leak only a third of the Lifeskills children in the observational test mentioned not using a mobile when asked about things one should never do in the event of a gas leak. Furthermore 12% of Lifeskills children did actually use the available

mobile rather than the landline when phoning for assistance. Nevertheless in Year 7 the Lifeskills children still knew more than the Control group about what to do in the event of a gas leak.

On the fire emergency task Lifeskills children acted out a fire escape routine better than the Control group children. Lifeskills children were more likely than Control group children to shut the door to the fire, get down low while leaving the house and give details of their location and phone number in the course of a 999 phone call. Lifeskills children hardly ever entered the room to investigate the fire, whereas approximately a third of the Control group children did. When constructing an escape plan on the paper and pencil test the Lifeskills children were more likely than the Control children to include 'shouting fire', and were less likely to include 'collecting a pet'. Twelve months after their visit to Lifeskills Year 7 children still knew more than the Control group about how to construct a fire escape plan. It is clear therefore that the Lifeskills programme is improving children's fire escape skills and knowledge. Nevertheless the absolute levels of attainment were not high. Lifeskills children did include 'shouting fire' in their escape plan in the paper and pencil test, but less than 20% of them shouted 'fire' in the performance test. Although nearly all the Lifeskills children used the phone to make an emergency call, 60% of the Lifeskills children tested off-site made the phone call from inside the building.

For the Recovery Position the results were very different on the performance and knowledge tests. The knowledge task was a test of recognition of the Recovery Position in which the child had to choose which of four pictures was correct. Ninety four per cent of Lifeskills children selected the correct picture three months after instruction. Control group children who did not already know the Recovery Position believed that it was safe to leave a person on their back and with their head propped up. Hardly any Lifeskills children made this mistake. By year 7 the difference between the two groups had dissipated. By then roughly 70% of each group could pick the right picture.

In the performance test children were required to place an "injured" child in a safe position. Very few children could do this adequately although the Lifeskills children outperformed the Control children. They had learned that it is important to place the person on their side but the other manoeuvres involved in placing someone in the Recovery Position were poorly learned. The moves involved in the Recovery Position are easy to confuse with one another and are unlikely to be familiar to the children. The unfamiliarity, complexity and potential for confusion of the elements of the Recovery Position routine may explain why it is less successfully learned by the children than the gas and fire routines. When asked whether the position into which they had moved the "injured" person was correct the Lifeskills children were less able than the Control group children to recognise when they were wrong.

Altogether Lifeskills is improving children's skills in dealing with all four emergency routines – water, gas, fire and the Recovery Position. In the evaluation the relative success of the Lifeskills children was very marked especially on the performance tests. They had on average mastered 25% more elements of these routines than the Control group children. But the absolute level of Lifeskills children's performance was not high. On the observational tests virtually none of the Control group children managed to perform any of the routines completely correctly while on average 10% of Lifeskills children managed a perfectly correct performance. The Lifeskills children's success was variable from task to task. Most importantly the current evelauation suggests that certian key messages are not well-learnt particularly about actions the children should avoid since they increase the danger to themselves. For instance children who had been to Lifeskills were still likely to switch electrical appliance off in the event of a gas leak. In the water scenario, children learned that it is good to reach out with a suitable object to a person in

difficulties, but did not sufficiently differentiate between the hazardous action of reaching out while standing up and the appropriate action of reaching out while lying down.

For routines, psychological research suggests that skill acquisition depends upon 1) the familiarity of the elements, 2) the distinctness of the elements, and 3) their organisation into a clear sequence [46]. In addition sequences are easiest to remember if their elements are associated with real or hypothetical spatial locations [47]. The elements of the fire escape routine taught by Lifeskills that are well-learned are closing the door, leaving the house, and using the correct (external) telephone. These elements and the sequence itself have all the features listed above as aids to learning. We recommend that Lifeskills consider teaching gas and water safety more clearly as routines, i.e. articulated sequences of actions. Furthermore, the elements in the routines may be better learned if they are themselves more distinct from each other. In the gas scenario, children may do better at learning not to switch off electrical appliances if they are not taught to switch off the gas at the mains. In the water scenario, Lifeskills could consider making the body position when reaching out a more important aspect of the instruction. In the case of the Recovery Position the one element of the sequence which was learned was rolling the person onto his/her side. This element is familiar and highly distinct from other elements in the procedure. The other elements, in contrast, are unfamiliar and not distinct from each other. The routine will therefore be intrinsically difficult to learn and perhaps cannot be taught without more time and repetition. Reviews of childhood injury interventions concur in the view that educational interventions need to limit their messages and to reinforce them with follow-up work if they are to be effective [6, 8, 10].

Confidence, especially in dealing with emergencies

The children's confidence in dealing with emergencies was assessed by how quickly they started to act and by their response to direct questions about their confidence. The Lifeskills children were more confident than the Control children by both measures. The Lifeskills children claimed more confidence than the Control group children in response to the direct paper and pencil test questions about knowing what to do in the event of a gas leak and in the event of a fire. Twelve months after their visit Year 7 Lifeskills children were still more confident than the Control group children by these measures.

Judged by their speed of reaction at the beginning of each observational test the Lifeskills children were significantly more confident than the Control group children when acting out what they would do to help someone struggling in a river, when carrying out a fire escape plan, and when attempting to place someone in the Recovery Position. They were also more confident in indicating where a car would stop under emergency braking. In contrast the Lifeskills children were no more confident than the Control group on the observational tests of their response to a gas leak or their attempt to make a kitchen safe for a toddler.

Misplaced confidence can be dangerous so it was very encouraging that the Lifeskills children's confidence measured by speed of reaction was entirely appropriate since the children who were quicker to react were the ones who performed the task better. This was so on all the observational performance tasks. Among the Control group children in contrast the more confident children were not necessarily the ones who performed better. It is therefore fair to conclude that the Lifeskills programme is succeeding in improving children's confidence in their ability to deal with emergencies, and the increased confidence is mirrored by increased competence.

Conclusions

The current evaluation has found the Lifeskills programme to be successful in all four aspects of impact that were investigated. It is equally successful with boys and girls, and with children from

lower and higher achieving schools. It improves children's alertness to hazards, their knowledge about preventive measures, their skill in dealing with emergencies, and their confidence in dealing with emergencies. The smallest impact appeared to be on children's alertness to, and recognition of hazards.

In the evaluation overall the differences between the Lifeskills group and the Control group were often statistically significant when the levels of performance of the two groups were not very different at all, e.g. only a slightly higher percentage of Lifeskills children succeeded on a task or the Lifeskills children succeeded on average in performing only one more element of a multi-element routine or the Lifeskills children spotted on average only one more of the seven hazards shown in a picture of a room. Such small differences point up the fact that in some cases the Lifeskills experience was having only a small effect on the children's knowledge and performance.

In fact such small effects are the norm in educational interventions with children[48]. It is therefore encouraging that many of the effects found in the current evaluation were not small, and compare favourably with effect sizes found in the evaluation of other interventions (e.g. the Injury Minimisation Programme for Schools which focused on teaching safety skills to Year 6 children in Oxford [26]). The majority of the larger effects in the current evaluation were found on the performance measures rather than the knowledge measures. This suggests that the Lifeskills programme somewhat improves children's safety knowledge but has more impact on children's capacity to act on their knowledge. Since the Lifeskills children were more confident than the Control group children and the more confident among the Lifeskills children performed best it may be the extra confidence instilled by Lifeskills that is responsible for the fact that the improvements in performance were more marked than the improvements in knowledge.

Taken as a whole the results of the current evaluation strongly suggest that, although there are areas in need of improvement, the Lifeskills programme is succeeding admirably in increasing children's knowledge and, more strikingly, their self-confidence and capacity to put what they know into effect. The results imply that Lifeskills' own interactive safety skills programme can achieve Lifeskills' stated aim of bridging the gap between knowledge and performance. They perhaps also imply that other programmes that use vivid and realistic sets as a backdrop for similar interactive small group teaching methods may be able to enjoy equal success.

The results of the current evaluation can be viewed with confidence for a variety of reasons. A quasi-experimental design was employed, involving matched control groups and pre- and post-intervention measures. The evaluation was based on both performance and knowledge measures. The performance measures were taken in two locations to see whether the skills children had acquired generalised beyond the setting in which they were originally learned.

A limitation of the current evaluation is that only half of Lifeskills' scenarios could be assessed due to time constraints during school visits. Thus it is not possible to comment on children's acquisition of skill and knowledge in the other safety areas the programme sets out to cover. Also of course the performance measures involved role-playing rather than observing the children dealing with genuinely hazardous or life-threatening events. Nevertheless these role-playing performance tasks are a fuller test of the children's successful acquisition of safety skills than the paper and pencil tests in the current evaluation or the measures used in some other evaluations which rely solely on the opinions of users of an intervention to assess the intervention's effectiveness.

In this respect it is instructive to consider some of the focus group children's own claims about what they had learnt at Lifeskills. By and large the children clearly agreed with Lifeskills' own view that "doing" leads to better learning. As one girl said, "You exeperience it yourself, and you remember more." All the Lifeskills scenarios are of course "hands-on" and interactive in comparison with many other forms of learning. But some of the scenarios are more hands-on than others. We do not have any objective measure of the relative levels of interactivity among the Lifeskills scenarios. But one scenario mentioned by a number of children as not being sufficiently interactive was the river-set with its task of rescuing someone in difficulties in the water. Children therefore think that this scenario lacks a key characteristic that enhances the learnability of others. We have seen that key messages from the water scenario were not well-learned, and perhaps Lifeskills could consider how to make it more vivid and interactive for the children. Nevertheless the objective performance test revealed that the improvement in children's capacity to carry out a river rescue was one of the strongest effects in the entire evaluation. In other words the Lifeskills children learned far more on the river scenario than their own impressions of its learnability would lead us to expect. Certainly the performance tests are to be trusted more than the children's opinions. The performance tests in the current evaluation required the children to "do" rather than merely to "say" what they would or should do. They are therefore likely to be better predictors of children's responses in a real-life emergency[49].

6. RECOMMENDATIONS

The results of this evaluation suggest that, for the most part, a visit to Lifeskills taught children a sufficient amount in most areas of safety to distinguish their subsequent knowledge and performance from a matched Control group. Nevertheless it was apparent that some elements of some scenarios were not well learned. The following recommendations for changes to the programme are offered for consideration.

HOME SAFETY

Gas leak

- Reinforce messages about dangerous actions in particular what not to do: do not switch electric appliances on/off, do not use a mobile in the house
- Consider organizing elements into a more clearly articulated sequence
- Consider limiting the number of learning objectives
  For example, children may do better at learning not to switch off electrical appliances if they are not taught to switch off the gas at the mains

Kitchen hazards

- As Control group children in the in the tests and the focus groups showed as much knowledge and skill about what to do to rectify kitchen hazards as children in the Lifeskills group, it could be argued that this scenario might be dropped completely since children appear to have little left to learn in this domain. Alternatively, less time might be spent on kitchen hazards and more time on gas safety issues (since they are taught in the same location and timeslot, one after the other)

FIRE SAFETY

Fire escape plan

- Reinforce messages about shouting “fire”, using an outside phone to make an emergency call, and not rescuing pets

Bedroom fire hazards

- Relatively little learning is taking place in the bedroom scenario perhaps because it is in the same house on the Lifeskills set as the far more vivid fire emergency. Nevertheless half the children are learning the message about the potential danger of water on an electrical appliance. Continue to emphasize the message about water on electrical appliances

ROAD SAFETY

Seat belts

- Emphasize the road accident risk to car occupants as well as to pedestrians – and the need for one seat belt per person
- Consider making seat belt instruction more interactive

Pedestrian visibility

- Give added emphasis to the pedestrian visibility message
- Consider introducing more interactive instruction to alert children to how difficult it is for pedestrians to be seen by drivers in darkness or fading light

FIRST AID

Recovery Position

- Consider whether the full Recovery Position is too complex to be taught to children of this age unless more time is available for instruction

Water rescue

- Reinforce message about kneeling or lying down, not standing up, while reaching out to someone in difficulty
- Consider organising elements of the routine into a more clearly articulated sequence

DRUGS

- On the whole, children including those who had not been to Lifeskills performed well on the classification of drugs task. Consider refocusing the drugs scenario activity to include an emphasis on the health hazards of smoking and alcohol and on the skills children need to resist peer pressure. Such skills have value in a variety of risk areas for adolescents.

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GLOSSARY

Term	Meaning
Analysis of Variance	A procedure to test the statistical significance of the differences obtained among two or more means.
Chi- square (χ^2)	A statistic to compare the frequency of various categories of items
Cohort	Groups of persons born in the same year
Correlation	A term used to describe an association between two variables
Dependent variable	The outcome variable in a study (e.g. Knowledge score in the current evaluation)
Df	Degrees of freedom (A number related to the number of participants in a study or to the number of factors in a statistical investigation within a study)
Effect size	A statistical convention for quantifying the size of the difference between groups. In the case of the current evaluation, how big is the difference found between the Lifeskills group and the Control group on a particular measure.
F	A statistic obtained in analysis of variance calculations
Hierarchical loglinear analysis	A chi- square analysis with more than two variables which allows tests of partial association between variables
Mean	Average (the sum of all scores divided by number of scores)
Modal score	The most common value in a sample of scores
Negatively skewed	Most scores, within a set of scores, occurring at the low end
Normal distribution	A symmetric distribution of scores with more concentrated in the middle than at either end
r	Pearson's r (A statistical test of correlation used to analyse correlation)
Range	A measure of the dispersion of a set of scores, indicating top to bottom scores

Sd	Standard deviation (a measure of dispersion, indicating the average deviation of scores away from the mean of those scores)
Statistics	A range of techniques for analysing, interpreting and displaying data
Statistical significance	A finding (e.g. the difference between 2 means) is described as statistically significant when it can be demonstrated that the probability of obtaining such a difference by chance is relatively low.
Type 1 error	Wrongly infer that there is a significant result (e.g. a difference between 2 groups) when there is not.
P <0.05	When it is estimated that the obtained result would occur less than 1 time out of 20 by chance.
P <0.01	When it is estimated that the obtained result would occur less than 1 time out of 100 by chance. In the case of the current evaluation, when it is estimated that the difference between the Lifeskills and the Control group on a particular measure would occur at less than 1 time out of a 100 by chance.
P < 0.001	When it is estimated that the obtained result would occur less than 1 time out of a 1000 by chance
Univariate analysis of variance	An analysis of variance with one dependent variable