

we are asking them to think carefully about ways in which they can present their work so that its appeal is as broad as possible. Every paper in this journal should have something to offer every reader, no matter where they live. The

goal of this exercise is not to cure myopia but to try to limit its negative effects.

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## Education

# Issues in safety education interventions

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The paper by Lamb *et al* reports an evaluation of a safety education “village” that has been running in Bristol, UK for some years.<sup>1</sup> The training that children receive is comprehensive and includes safety in the home and garden; on farms and the countryside; by rivers, railways, and building sites. It even addresses product labeling. There is also an element of road safety training, although this is surprisingly limited. In addition to its use with children, the village has been used to help the learning disabled.

To the authors’ credit, an evaluation of the program’s effectiveness with this population has also been undertaken. The Lifeskills program has a good website (which incidentally contains lengthier reports, both of the current evaluation and of that undertaken with learning disabled adults), and readers interested in the concept of a “safety village” should certainly take the time to visit it (<http://www.lifeskills-bristol.org.uk/index.htm>).

The concept of a regional training center where children receive intensive exposure to a variety of activities in a single visit is a popular one and has been implemented with varying degrees of sophistication for many years. Such centers have the attraction of providing relatively realistic contexts within which learning can take place and they usually involve at least some degree of practical training which, from a learning point of view, is highly desirable.<sup>2</sup> Children generally enjoy them and their high face validity makes them popular with both schools and parents.

To some extent this high face validity is their downfall, however—such schemes often appear to be doing so obviously worthwhile a job that evaluation may seem an unnecessary luxury. That, at least, is the conclusion I draw from the relative infrequency with which evaluations are undertaken in this area. In this respect, the Lifeskills team and their sponsors are to be congratulated for the evaluation reported in this issue.

The paper reports very encouraging results which the authors are justified in highlighting. It also raises a number of issues regarding the character of an effective intervention and its evaluation that the reviewers felt deserved a wider airing. Here, I identify some of the issues that were raised in the hope that, by making them explicit, we might assist others considering implementing and evaluating interventions of this type.

The Lifeskills program contains a number of elements that, in principle, represent best practice. An example is the use of group work, in which three or four children cooperate in problem solving under the guidance of an adult volunteer. We ourselves have used this peer collaborative approach extensively in our work on child pedestrian training.<sup>3-6</sup> However, it is important to emphasize that the benefits of this approach depend entirely on the nature of the interactions that the adult facilitator succeeds in promoting among the children. If trainers interact with the group in much the same way as they would with an individual child,

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the approach will offer no particular benefits (other than putting more children through the program in a given period of time). To be effective, the emphasis must be on interaction between the children themselves, with the trainer’s role being no more than facilitative.

Conceptual growth occurs (1) as children become aware of points of view conflicting with their own and (2) insofar as joint discussion and activity leads to reconciliation of these points of view within the individual child’s cognitive representation.<sup>7-9</sup> The approach is emphatically non-didactic, with no memorizing of rules or other information, and the measure of success is always the child’s ability to construct solutions to new problems rather than repeat previously learned rules or actions. The approach is particularly advantageous where material is complex or conceptually challenging and where there is a danger that children may simply learn to deploy rules or procedures in a rote fashion. As this characterizes so much of children’s learning, the peer collaborative approach has found widespread application in many fields.<sup>10-16</sup>

The success of the present intervention—particularly in relation to the long term improvements that are reported—may well lie in this aspect of the program, although the precise nature of its implementation is far from clear. Nevertheless, this aspect of the intervention deserves to be more widely considered in safety education research.

A second and related issue concerns the relation between knowledge and behavior. Many interventions aim to improve the former on the assumption that improvements in knowledge will generalize to behavior. However, there is little, if any, justification for this assumption. Indeed, measurable improvements in knowledge may give rise to no corresponding changes in behavior at all.<sup>2 17 18</sup> To its credit, the Lifeskills program recognizes this and a fair amount of the training focuses on behavior—for example, in physically acting out what to do in the event of a fire. It follows that evaluation should

also focus on behavior. It is unfortunate that, in the present case, the authors were forced to place so much emphasis on knowledge, with no behavioral measures reported in Study 2 at all. Behavioral improvements were certainly obtained in Study 1 and these correlated moderately with children's knowledge scores. However, it is not justifiable to assume on this basis that knowledge can act as a proxy for behavior. In principle, the reported improvements in knowledge *might* have preceded (and therefore possibly caused) behavioral improvements but there is no way of determining this. It is equally possible that training improved knowledge and behavior independently—or indeed, that behavioral improvements drove changes in children's declarative knowledge. The moral must surely be that, if behavioral changes are what is desired, then behavior itself is what should be measured.

A more general issue raised by the "safety village" concept is the extent to which learning can be expected on the basis of a single (albeit extended) training session. The Lifeskills evaluation suggests that at least some safety skills can benefit quite a lot. However, it is important to be aware that not all skills are likely to improve to the same extent on this basis. Pedestrian skills, for example, are generally too complex for children to acquire in so short a time. Our own research suggests that some pedestrian skills require four to six sessions before improvements become substantial.<sup>3</sup> As the authors of the present study also note, the effectiveness of the "one off" approach is likely to vary according to the complexity of the skills in question. This should hardly be surprising: how well would you expect your child to swim after one (or even four) training sessions? Those attracted by the idea of providing children with short, intensive experiences to improve their safety behavior need to consider carefully how much can realistically be expected in relation

to the particular behavior they seek to improve.

There is also a substantial literature on the effects of massed versus distributed practice, with the latter long regarded as generally leading to better learning outcomes.<sup>19</sup> Again, where the focus of attention is on more complex skills (pedestrian skills being a good case in point), it is unlikely that single training sessions, no matter how elaborate, will produce optimal results.

Nevertheless, the present intervention reports substantial improvements in many areas and contains a number of praiseworthy characteristics. The relative focus on behavior, the use of interactive learning methods, the integration of volunteer trainers into the program, and the effort to use realistic training scenarios all represent best practice. A particularly notable feature (not discussed in the evaluation) is the use of a Detective Assessment Protocol, aimed at encouraging children to carry out a subsequent risk assessment of safety in their own homes. Intended to help children generalize safety skills to the real world, this is an admirable aspect of the intervention that deserved to be evaluated in its own right. Follow up activities of this kind could well play a key role in promoting transfer of learning—the major challenge to all educational interventions.

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