which tools, equipment, and buildings are all designed for the right handed majority but increase injury risk for the left handed. This certainly makes it incumbent on schools to ensure that the appropriate tools are available for left handed children and that appropriate protective equipment for sport and leisure activities is also provided.

The second explanation is bound up with left handers own self perception as being more clumsy, perhaps as a result of being told so by other people. We found this was true of the Scottish children, as did Graham et al. This could arise from learning a complex skill such as handwriting, which inevitably appears more untidy in the early years, and gives rise to feelings of inferiority when commented on. Ensuring that teachers are aware of such issues should decrease the likelihood of these children developing poor self esteem.

The importance of skills' analysis

By focusing more on the idea of increased injury susceptibility at particular ages, accident proneness is made more acceptable because the possibility of change is implicit in the course of development. It also encourages a search for explanations of such phases in development, and from these are borne useful intervention measures. Analysis of the skill component involved in road crossing behaviour is a good example. In one study children were instructed in a real road environment close to their schools to choose 'the safest' crossing sites and routes to a specified destination. Children 5 to 7 years old were very poor at identifying unsafe road crossing sites compared with older children, and their judgments relied exclusively on cars they could see nearby. Blind supports, obscuring obstacles, or complex junctions were not recognized as dangerous and they invariably chose the most direct route, rather than make a safer detour. Substantial improvements were subsequently achieved in the training programme because the requisite skills had been identified. Far from such skills being dependent on maturational factors, as is often assumed in road safety research, development was accelerated through a training procedure that aimed at providing the children with appropriate experience from which to learn for themselves.

So finally, yes, by all means let press ahead with passive measures and legislation, where appropriate, but in doing so we should not neglect the search for causes of injury. Statistical approaches are essentially descriptive, whereas psychological approaches generate testable hypotheses with regard to the behaviour or personality of 'repeaters'. Parents (and children) will continue to believe that some children have more injuries than others. It is our job to demonstrate that such fatalism should be set aside.

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DISSENT

‘Accident proneness’: statistical and practical significance

John D Langley

The two classics reprinted in this issue are among the most frequently quoted papers to support the notion of accident proneness (see pages 135 and 144). I suspect, however, that many have quoted the papers without having read them critically. To compound the situation, it would appear that there are other quoters who have never read the papers. They, in effect, quote the quoters. Before long the mere repetition becomes all that is necessary and sufficient to establish the findings as fact.

It is not my intention to review each study here as that has been done on many other occasions. Rather, I wish to focus on the practical implications the authors of these two papers, and those of a selection of subsequent similar studies, drew from their findings. This contrasts with what appears to be the focus of many other readers, namely statistical significance.

The necessity for such a focus was brought home to me a few years ago when an associate
editor of this journal said in casual conversation that it was ironic, given my criticism of the concept,12 and the conclusions in my early papers on psychosocial factors and childhood injury,4–9 that my research has been used by others to support the notion of accident proneness. So what did the authors of the classic papers conclude?

In 1971, Mellinger concluded ‘... the high-accident group, as we have defined it, represents only a very small proportion of all children. One might wonder, then whether accident repeatedness really is such an important health problem’ (p512).4 The authors concluded it was, but they failed, however, to discuss the practical implications of their findings.

Like the Manheimer and Mellinger study, that conducted by Matheny and others was concerned with the personal characteristics of the victims, albeit with a smaller study population and more limited range of measures.4 They concluded ‘... the concept of accident-prone child appears to be a viable one’ (p124). They did not quantify the risk or discuss how the concept might be ‘viable’.

The 1980s saw several reports, including one by Matheny,9 that examined a wider range of psychosocial factors. This represented a significant departure from the notion of proneness as an ‘... intrinsic and relatively immutable trait’ (p46). A number of these investigators sought to quantify the risk and discuss the public health significance of their findings. For example, Beautrais and others, in their study of risk factors associated with poisoning in the first three years of life, concluded: ‘Finally, it must be stressed that while a number of risk factors were associated with accidental poisoning, the variation in the rates of poisoning explained by these factors was small: collectively, the risk factors studied explained only 5% of the total variance in poisoning’ (p109).9 In a subsequent similar report of non-poisoning injury incidents they showed a similar array of risk factors and concluded: ‘... The practical application of this information is very limited since there is no obvious method by which levels of family stress can be reduced or highly active stimulus seeking behaviour in preschool children can be curbed. These considerations suggest that while the best approach to childhood accident prevention is through creating home environments in which defects in parental vigilance or excesses of child activity do not lead to serious accidents’ (p241).10

The conclusion of Beautrais and others illustrates an important concept that seems to elude many involved in injury prevention, namely that the choice of countermeasures should not be determined by the relative importance of causal or contributing factors or by their earliness in the sequence of events. Rather, priority should be given to measures that will most effectively reduce injury. This is well illustrated by childhood poisonings and domestic pool drownings where factors such as low levels of vigilance may well be a significant risk factor but the promotion of child resistant closures and fencing of pools has had the most significant impact on reducing unnecessary morbidity and mortality.

In contrast to his 1971 paper, Matheny explored the prevention implications of his 1988 research findings. He correctly pointed out there are practical and economic limits to what can be achieved in modifying unsafe aspects of our physical environment. He went on to argue that it is undoubtedly the case that a focus on the individual has been effective in modifying behaviours such as smoking, diet, and exercise.5 On this basis he made the following statement in discussing high risk parents and households: ‘Our impression of these families is that they are less assertive or energetic in dealing with many aspects of family life, including the guidance of children. For them, the environment may have to be taken by health professionals if one expects the parents to budge from the status quo’ (p59). As with other areas of health, such an approach is unlikely to be very successful because the caregivers of children most at risk are less amenable to the health promotion messages and less able to implement desirable changes in behaviour.

Given that there are limits on the funds that can be expended on making physical environments safer there is nevertheless merit in identifying individuals in high risk social situations. For example, assume children in large, single parent, low income families, living in low standard rental housing are at elevated risk of scalds from tap water. Injury prevention funds, however, should be directed at improving their hot water system either directly or indirectly by promoting laws which require rental accommodation to meet hot waters safety standards rather than focusing on the behaviour of potential victims and their caregivers.

'Accident proneness': statistical and practical significance.

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